Digital Leadership and Employees' Innovative Work Behavior in Creative Design Enterprises: Evidence from Chongqing, China

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Abstract: - This study examines the relationship between digital leadership and employee innovative work behavior in AIGC-enabled creative design enterprises in Chongqing, China. It pursues three objectives: to test the direct relationship between digital leadership and innovative work behavior; to examine the mediating roles of STARA awareness, digital work self-efficacy, and digital organizational citizenship behavior; and to assess the moderating role of work autonomy. Grounded in social cognitive theory and social exchange theory, the study proposes that digital leadership is related to innovation through lower AI-related threat, stronger digital confidence, and voluntary digital knowledge sharing, with work autonomy shaping these relationships. A sequential mixed-methods design was used. Semi-structured interviews with 25 employees and managers informed construct contextualization and item wording, followed by a pilot test with 116 valid responses. The main survey obtained 516 valid responses from employees across nine creative design subsectors. Data were analyzed using CFA, SEM, bias-corrected bootstrapping, and hierarchical regression. Results supported all 13 hypotheses. Digital leadership was positively associated with innovative work behavior, digital work self-efficacy, and digital organizational citizenship behavior, and negatively associated with STARA awareness. STARA awareness was negatively associated with innovative work behavior, whereas digital work self-efficacy and digital organizational citizenship behavior were positively associated with it. The three mediation paths jointly accounted for 75.9% of the total effect. Work autonomy buffered the negative STARA awareness–innovation link and strengthened the positive links from digital work self-efficacy and digital organizational citizenship behavior to innovation. These findings extend digital leadership research by identifying a cognitive–capability–citizenship mechanism for innovation in autonomy-supportive AIGC work.

Key-Words: - Digital Leadership; Innovative Work Behavior; STARA Awareness; Digital Work Self-Efficacy; Digital Organizational Citizenship Behavior; Work Autonomy

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1 Introduction

Digital transformation has become an everyday condition of organizational work rather than a distant strategic agenda [1], [2]. In the creative economy, this transformation is particularly important because creative products and services depend heavily on continuous idea generation, knowledge recombination, and rapid implementation. UNCTAD reported that global exports of creative services reached USD 1.4 trillion in 2022, nearly double the exports of creative goods, and emphasized that digitalization and artificial intelligence are reshaping creative industries [3]. At the employee level, innovation depends not only on the availability of digital tools but also on employees' innovative work behavior, including idea generation, idea promotion, and idea implementation [4], [5]. However, the use of generative AI may produce mixed consequences. It can improve efficiency and creative output in some tasks, but it may also increase output homogenization, reduce idea diversity, and intensify concerns about human expertise being replaced [6], [7], [8]. Therefore, an important research problem is how leadership can help employees transform digital technologies into innovative work behavior rather than anxiety, avoidance, or routine tool use.

In China, the rapid expansion of the digital economy and the policy emphasis on artificial intelligence and cultural-creative industries have accelerated the integration of digital technologies into design-related work. In the context of this article, we take creative design companies in Chongqing as

an example. Chongqing was named a "City of Design" by UNESCO in 2023, building up a vast creative design industry, including more than 300 design parks, 50,000 design enterprises, and 500,000 design workers [9]. The local creative design firms have started using AI-generated content (AIGC), design software, online collaboration platforms, and project management systems for project-based work. However, the introduction of technology alone cannot directly drive employee innovation. Creative design employees operate under specific client demands, limited time schedules, fast turnaround times, and digital tools-based teamwork. Employees may face anxiety about potential AI substitution, disparate levels of digital proficiency, inadequate willingness to share digital knowledge voluntarily, and insufficient freedom to try out novel approaches. Previous research has examined digital leadership and employee innovation [10], [11]. However, prior studies have rarely integrated threat appraisal, digital capability belief, and discretionary digital behavior into one employee-level explanation of how digital leadership is linked to innovative work behavior. The boundary role of work autonomy in translating these mechanisms into innovative work behavior also remains under-specified, although autonomy is central to proactive and innovative action [12], [13].

To address these gaps, this study aims to examine the relationship between digital leadership and employees' innovative work behavior in Chongqing's creative design enterprises. Specifically, it investigates whether STARA awareness, digital work self-efficacy, and digital organizational citizenship behavior mediate this relationship, and whether work autonomy moderates the relationship between these mediating variables and innovative work behavior. Drawing on social cognitive theory and social exchange theory, this study positions digital leadership as a managerial condition that may shape employees' technology-related interpretation, digital task confidence, and voluntary digital collaboration [14], [15], [16]. Methodologically, the study adopted a sequential mixed-methods design. The qualitative phase was used to contextualize the constructs and refine the wording of measurement items; the pilot test was used to purify the adapted scales; and the main quantitative survey was used to test the proposed model among employees in Chongqing's creative design enterprises. The scientific significance of this study lies in explaining digital leadership and innovative work behaviors in a creative company that uses AI-powered digital communication, based on employee-level mechanisms. It also provides practical insights on reducing AI-related risks, strengthening trust in digital technologies, promoting digital knowledge sharing, and supporting autonomy. The objectives of the research are:

(1) To examine the relationship between digital leadership and employees' innovative work behavior in Chongqing's creative design enterprises.

(2) To test the mediating roles of STARA awareness, digital work self-efficacy, and digital organizational citizenship behavior in the relationship between digital leadership and employees' innovative work behavior.

(3) To assess the moderating role of work autonomy in the relationships between each mediating variable and employees' innovative work behavior.

2 Literature Review

Innovative work behavior refers to employees' intentional generation, promotion, and implementation of new ideas, methods, or procedures in their work roles [17]. Unlike general innovation performance, it emphasizes the behavioral process through which employees identify problems, develop ideas, gain support, and translate ideas into practical outcomes. In AIGC-enabled creative design work, this process is particularly salient because employees must combine artistic originality, digital tool use, client requirements, technical feasibility, and rapid project iteration. Digital leadership provides a managerial explanation for how such innovation behavior may be supported in digitally intensive work. Originating from e-leadership research, digital leadership emphasizes leadership processes shaped by information and communication technologies [18], [19], and has developed into a broader capability involving digital vision, technological awareness, digital communication, resource orchestration, and support for adaptation [20], [21]. Prior studies have linked digital leadership with employee innovation and innovation-related outcomes because digital leaders provide strategic direction, resources, psychological support, and opportunities for experimentation [22]. However, existing research has not sufficiently explained how employees move from digital leadership cues to innovative work behavior through multiple employee-level mechanisms, particularly in AIGC-enabled creative design enterprises.

Social cognitive theory argues that environmental cues shape behavior through cognitive appraisal and efficacy beliefs [23]. Digital leadership can be viewed as a salient environmental cue because it may shape whether employees interpret AI as

substitutive automation or human augmentation, and whether they feel capable of using digital tools in their work [24], [25]. STARA awareness captures the threat-appraisal side, referring to employees' perception that smart technology, artificial intelligence, robotics, and algorithms may affect or replace their work [6]. In creative design work, such concerns become salient because generative AI can produce images, text, visual concepts, and other artistic media, making parts of drafting, rendering, layout design, and copywriting appear susceptible to automation or partial substitution [26], [27]. Digital work self-efficacy captures the capability-belief side, referring to employees' confidence in using digital tools and platforms effectively. It is grounded in self-efficacy and computer self-efficacy research [28] and is also consistent with technology acceptance research emphasizing capability-related beliefs in technology use [29]. By providing sensemaking, demonstrations, feedback, and trial-and-error support, digital leadership may lower threat appraisal and strengthen capability belief [30]. Thus, STARA awareness and digital work self-efficacy represent two social-cognitive pathways—threat reduction and capability building—through which digital leadership is associated with innovative work behavior.

Social exchange theory explains the behavioral pathway from digital leadership to innovative work behavior: employees who perceive leadership support and resources may reciprocate through discretionary behaviors [16]. Extending organizational citizenship behavior to digital work, digital organizational citizenship behavior refers to voluntary online assistance, digital knowledge sharing, platform support, and suggestions for improving digital collaboration [31]. In creative design enterprises, such behavior may involve sharing prompts, templates, plug-ins, AIGC workflows, troubleshooting experience, and tool-use knowledge, reflecting how generative AI reshapes creative and knowledge work through prompt-based interaction and workflow adaptation [32]. Because project-based creative innovation depends on the circulation and recombination of digital knowledge across teams, digital organizational citizenship behavior is expected to mediate the relationship between digital leadership and innovative work behavior through a social-exchange and knowledge-diffusion pathway [33], [34].

Work autonomy refers to employees' discretion over work methods, scheduling, and procedures [35]. Work design theory regards autonomy as a core job characteristic because it allows employees to decide how tasks are performed and to take responsibility for outcomes [36]. Prior research further shows that autonomy supports proactive and innovative behavior by giving employees latitude to experiment, adjust methods, and implement new ideas [12], [13]. In this study, work autonomy is positioned as an action-enabling boundary condition: it may determine whether reduced threat appraisal, stronger digital work self-efficacy, and voluntary digital collaboration can be translated into innovative work behavior.

The reviewed literature establishes a hierarchical explanation of how digital leadership is associated with employees' innovative work behavior in AIGC-enabled creative design enterprises. Digital leadership functions as a distal managerial condition, while STARA awareness, digital work self-efficacy, and digital organizational citizenship behavior operate as proximal employee-level mechanisms reflecting threat appraisal, capability belief, and voluntary digital collaboration. Work autonomy further serves as an action-enabling boundary condition that shapes whether these mechanisms are translated into innovative behavior. This integrated perspective addresses the limitation of prior research that has often examined digital leadership, technology-related cognition, digital capability, and citizenship behavior separately.

Based on the theoretical frameworks reviewed above, the proposed conceptual framework is presented in Figure 1, and 13 hypotheses were proposed, covering direct effects (H1–H7), mediating effects (H8–H10), and moderating effects (H11–H13).

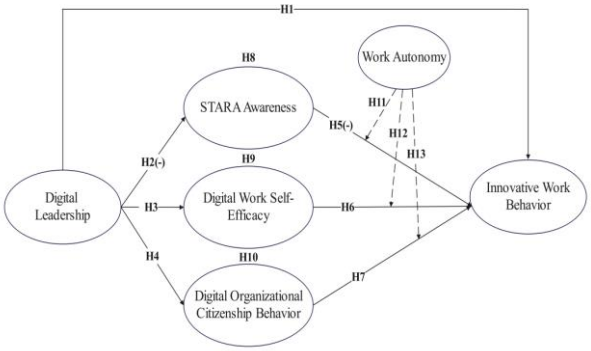


Fig. 1: Research Conceptual Framework
Source: created by the authors

3 Research Methodology

This study employed a sequential mixed-methods design in Chongqing's creative design enterprises, comprising qualitative contextualization, pilot testing and scale purification, and a main quantitative survey for model testing.

3.1 Qualitative Contextualization

The purpose of this step was to examine whether the predefined constructs were meaningful in Chongqing's creative design enterprises and to support the contextual adaptation of the measurement items, rather than to generate a new theoretical model. Using purposive and snowball sampling, 25 participants were interviewed, including 7 senior managers or department heads, 6 project or team leaders, and 12 frontline employees from nine fields such as brand design, UI/UX design, advertising creativity, video editing, illustration, spatial design, and digital media content production. Semi-structured interviews were conducted online, each lasting approximately 45 to 75 minutes. The interview protocol covered digital leadership, STARA awareness, digital work self-efficacy, digital organizational citizenship behavior, work autonomy, and innovative work behavior. With participants' consent, all interviews were recorded, transcribed, and anonymized.

The qualitative data was analyzed using directed content analysis with the six predefined constructs as the initial coding framework. NVivo 12 was used to support coding. The analysis generated 120 initial codes and 12 localized sub-themes, clarifying how the constructs were expressed in AIGC use, online collaboration, and project-based creative design work. Interviews 22 to 25 mainly confirmed existing themes, suggesting adequate data saturation. The findings supported the contextual relevance of the constructs and helped refine questionnaire wording, while the conceptual model and hypothesized relationships remained unchanged.

3.2 Pilot Test and Scale Purification

The pilot questionnaire was developed from established scales and refined according to the qualitative findings. Digital leadership was adapted from [37], STARA awareness from [6], digital work self-efficacy from [28] and [29], digital organizational citizenship behavior from [31] and [38], work autonomy from [35], and innovative work behavior from [5]. All items were measured using a seven-point Likert scale.

Of 117 pilot questionnaires returned, 116 were valid. Item analysis, reliability analysis, and EFA were used for scale purification. The data were suitable for factor analysis (KMO=0.882; Bartlett's test χ^2=4835.867, *df*=630, p< 0.001), and six factors explained 81.105% of the total variance. Based on statistical criteria and theoretical judgment, 10 items were removed. The final questionnaire retained 36 core items: 7 for digital leadership, 4 for STARA awareness, 4 for digital work self-efficacy, 7 for digital organizational citizenship behavior, 6 for work autonomy, and 8 for innovative work behavior. The retained items were renumbered sequentially within each construct for reporting purposes.

3.3 Main Survey and Model Testing

The main survey targeted full-time employees of creative design enterprises in Chongqing who could evaluate their leaders' digital leadership behaviors. Using multistage non-probability sampling, respondents were recruited across nine creative design subsectors. Freelancers, temporary interns, external contractors, and employees without regular digital work experience were excluded. The questionnaire was distributed online through Wenjuanxing between April and May 2026.

A total of 600 questionnaires were distributed, and 547 were returned. After excluding incomplete questionnaires, patterned responses, abnormal response times, and responses failing the screening criteria, 516 valid responses were retained. The reliability and convergent validity results are summarized in Table 1.

Quantitative data were analyzed using SPSS and AMOS. Descriptive statistics, reliability analysis, common method bias assessment, CFA, SEM, bias-corrected bootstrapping, and hierarchical regression analysis were conducted. Common method bias was examined using Harman's single-factor test and a CFA-based model comparison. The measurement model was assessed through reliability, convergent validity, discriminant validity, and model fit indices [39]. SEM was used to test the direct effects; bootstrapping with 5,000 resamples was used to examine mediation effects; and hierarchical regression with mean-centered variables was used to test the moderating effects of work autonomy. To strengthen statistical transparency, t-type statistics, chi-square statistics, degrees of freedom, p-values, R^2 changes, and confidence intervals are reported where applicable across Tables 2–5.

Table 1. Reliability and Convergent Validity of the Final Measurement Scales

Scale	Items	α	CR	AVE
DL	7	0.912	0.912	0.597
SA	4	0.885	0.887	0.663
DWSE	4	0.854	0.855	0.596
DOCB	7	0.895	0.895	0.550
WA	6	0.879	0.880	0.549
IWB	8	0.917	0.917	0.582

Source: authors' own elaborations

Table 2. Statistical Diagnostics

Test	Statistic	df	p/ criterion
Pilot Bartlett's test	χ^2= 4835.867	630	p < .001
Main Bartlett's test	χ^2 = 10899.567	630	p < .001
Six-factor CFA model	χ^2 = 646.281	579	χ^2/df = 1.116
SEM structural model	χ^2 = 462.031	398	χ^2/df = 1.161
Harman single-factor test	36.33%	—	< 40%

Source: authors' own elaborations

4 Research Results

4.1 Preliminary Qualitative Findings

Before the quantitative model testing, the qualitative phase provided preliminary contextual evidence for the relevance of the six predefined constructs in AIGC-enabled creative design work. The directed content analysis generated 120 initial codes and 12 localized sub-themes, showing that digital leadership, STARA awareness, digital work self-efficacy, digital organizational citizenship behavior, work autonomy, and innovative work behavior all had clear empirical expressions in the study context. Interviews 22 to 25 mainly confirmed existing themes without producing substantive new contextual information, indicating data adequacy. These findings supported the contextual appropriateness of the constructs and the wording of the questionnaire items, while the conceptual model and hypothesized relationships remained unchanged.

4.2 Measurement and SEM Results

Measurement quality and common method bias were first assessed. Harman's single-factor test showed that the first factor explained 36.33% of the variance, while the six-factor CFA model fit substantially better than the single-factor model. The Fornell–Larcker criterion and HTMT also supported discriminant validity.

For Objective 1, digital leadership was significantly related to employees' innovative work behavior. The structural model demonstrated good fit (CMIN/DF=1.161, GFI=0.944, AGFI=0.935, NFI=0.951, IFI=0.993, TLI=0.992, CFI=0.993, RMR = 0.049, RMSEA = 0.018). Figure 2 presents the standardized path coefficients of the structural equation model. All direct-effect hypotheses (H1–H7) received empirical support, as reported in Table 3.

Digital leadership was positively associated with innovative work behavior (β=0.151, p<.01), negatively associated with STARA awareness (β=−0.446, p<.001), and positively associated with digital work self-efficacy (β=0.503, p<.001) and digital organizational citizenship behavior (β=0.509, p<.001). STARA awareness was negatively associated with innovative work behavior (β=−0.393, p<.001), whereas digital work self-efficacy (β=0.261, p<.001) and digital organizational citizenship behavior (β=0.333, p<.001) were positively associated with it. Thus, H1–H7 were supported.

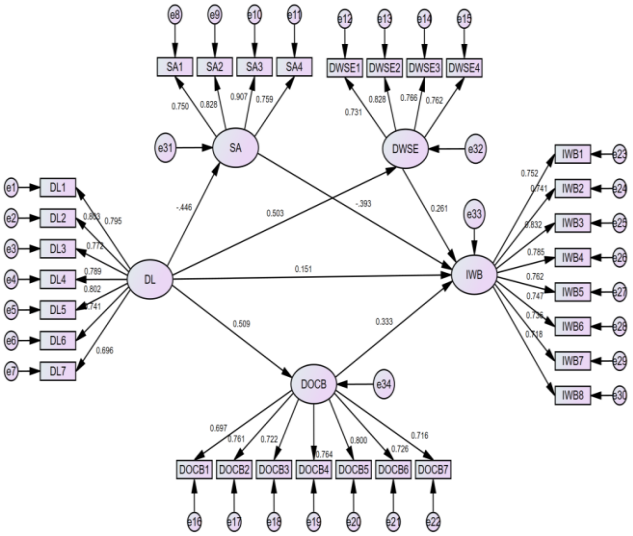


Fig.2: Standardized Structural Equation Model
Source: created by the authors

Table 3. Structural Path Coefficients of the SEM

H	β	B	S.E.	C.R.	p
H1	0.151	0.126	0.041	3.111	**
H2	-0.446	-0.459	0.051	-8.967	***
H3	0.503	0.421	0.043	9.712	***
H4	0.509	0.389	0.040	9.827	***
H5	-0.393	-0.321	0.035	-9.271	***
H6	0.261	0.262	0.042	6.190	***
H7	0.333	0.366	0.048	7.625	***

*Note. β=standardized coefficient; B=unstandardized coefficient; S.E.=standard error; C.R.=critical ratio, which functions as a large-sample t-type statistic for testing path coefficients in AMOS; ***p <.001, **p < .01.*
Source: authors' own elaborations

4.3 Mediation and Moderation Results

For Objective 2, bias-corrected bootstrapping with 5,000 resamples showed that all three indirect effects were statistically significant (Table 4).

STARA awareness significantly mediated the relationship between digital leadership and innovative work behavior, with an indirect effect of 0.175 and a 95% confidence interval of [0.110, 0.262]. Although both the path from digital

leadership to STARA awareness and the path from STARA awareness to innovative work behavior were negative, their product formed a positive indirect effect.

Digital work self-efficacy significantly mediated the relationship between digital leadership and innovative work behavior, with an indirect effect of 0.131 and a 95% confidence interval of [0.091, 0.182].

Digital organizational citizenship behavior significantly mediated the relationship between digital leadership and innovative work behavior, with an indirect effect of 0.170 and a 95% confidence interval of [0.123, 0.220].

The three indirect paths together accounted for 75.9% of the total effect of digital leadership on innovative work behavior. Since the direct effect remained significant (β= 0.151, p < .01), the findings indicate partial mediation. Therefore, H8, H9, and H10 were supported.

Table 4. Bootstrap Mediation Effects (bias-corrected 95% CI, 5,000 resamples)

H	Estimate	S.E.	Effect%	95% CI
H8	.175	.039	27.90	[0.110, 0.262]
H9	.131	.023	20.90	[0.091, 0.182]
H10	.170	.025	27.10	[0.123, 0.220]

Note. Effect%=percentage of the total DL–IWB effect (0.627) accounted for by each indirect path.
Source: authors' own elaborations

For Objective 3, hierarchical regression showed that all three interaction terms were significant. Work autonomy weakened the negative STARA awareness–innovative work behavior relationship (β=0.167, p<.001; ΔR^2=0.024) and strengthened the positive relationships of digital work self-efficacy (β=0.164, p<.001; ΔR^2=0.026) and digital organizational citizenship behavior (β=0.230, p<.001; ΔR^2=0.050) with innovative work behavior. H11–H13 were supported (Table 5).

Table 5. Moderating Effects of Work Autonomy

H	B	S.E.	β	t	p	ΔR^2
H11	0.117	0.025	0.167	4.716	<0.001	0.024
H12	0.165	0.034	0.164	4.843	<0.001	0.026
H13	0.217	0.032	0.230	6.798	<0.001	0.050

Note. B and β=unstandardized and standardized interaction coefficients, respectively; S.E.= standard error; ΔR^2 = increase in R^2 after adding the interaction term. H11: SA×WA→ IWB; H12: DWSE× WA →IWB; H13: DOCB× WA→IWB.
Source: authors' own elaborations

4.4 Mathematical Decomposition and Boundary Analysis

Let X denote digital leadership; M_1 , M_2 , and M_3 denote STARA awareness, digital work self-efficacy, and digital organizational citizenship behavior, respectively; and Y denote innovative work behavior. For the parallel mediation structure, the specific indirect, total indirect, direct, and total effects are

$$IE_j = a_j b_j (\mathrm{j} = 1, 2, 3); \quad (1)$$

$$IE_{total} = \Sigma_{j=1}^{3} a_j b_j; \quad (2)$$

$$DE = \mathrm{c}'; TE = \mathrm{c}' + IE_{total}. \quad (3)$$

Using the standardized SEM coefficients,

$$IE_{SA} = (-0.446)(-0.393) = 0.175;$$

$$IE_{DWSE} = (0.503)(0.261) = 0.131$$

$$IE_{DOCB} = (0.509)(0.333) = 0.170;$$

$$IE_{total} = 0.476;\ DE = 0.151;$$

$$TE = 0.627; \quad \frac{IE_{total}}{TE} \times 100\% = 75.9\%.$$

These analytical results reproduce the corresponding bootstrap estimates, confirming numerical consistency between the SEM effect decomposition and the mediation results.

The mathematical boundaries of the moderation effects were examined using the unstandardized coefficients from the final hierarchical regression models. The corresponding unstandardized main-effect coefficients were −0.393 for SA, 0.377 for DWSE, and 0.382 for DOCB. Let W_c denote mean-centered work autonomy. The conditional slopes are

$$\frac{\partial \hat{Y}}{\partial SA_c} = -0.393 + 0.117 W_c.$$

$$\frac{\partial \hat{Y}}{\partial DWSE_c} = 0.377 + 0.165 W_c.$$

$$\frac{\partial \hat{Y}}{\partial DOCB_c} = 0.382 + 0.217 W_c.$$

Setting each conditional slope equal to zero yields the corresponding sign-reversal boundaries:

$$W_{c,crit}^{SA} = 3.359;$$

$$W_{c,crit}^{DWSE} = -2.285;$$

$$W_{c,crit}^{DOCB} = -1.760.$$

The positive interaction coefficients indicate that increasing work autonomy attenuates the negative SA–IWB relationship while strengthening the positive DWSE–IWB and DOCB–IWB relationships. At W_c = 0, all three conditional slopes retain the hypothesized signs; thus, around the sample mean, work autonomy changes the effect magnitude rather than direction, indicating local directional stability.

5 Discussion

The findings support an employee-level explanation of how digital leadership is associated with innovative work behavior in AIGC-enabled creative design enterprises. Digital leadership was positively associated with innovative work behavior ($\beta = 0.151$, $p < .01$), consistent with e-leadership and digital leadership research emphasizing the role of leadership in shaping employees' interpretation and use of digital technologies. However, the modest direct effect suggests that digital leadership is linked to innovation largely through more proximal employee-level mechanisms rather than through direct managerial influence alone.

The mediation results clarify these mechanisms. STARA awareness showed an indirect effect of 0.175 (95% CI [0.110, 0.262]), and digital work self-efficacy showed an indirect effect of 0.131 (95% CI [0.091, 0.182]), supporting the social cognitive argument that confidence in using digital tools and AIGC-assisted workflows is an important mechanism linking environmental and leadership cues to innovative behavior. Digital organizational citizenship behavior showed an indirect effect of 0.170 (95% CI [0.123, 0.220]). Together, the three pathways accounted for 75.9% of the total effect. These findings indicate that digital leadership is associated with innovation through three complementary routes: threat reduction, capability building, and digital collaboration. This pattern integrates social cognitive and social exchange perspectives by showing that employee innovation depends not only on how technological change is interpreted, but also on employees' confidence in digital work and their voluntary sharing of digital knowledge.

Work autonomy further functioned as an enabling boundary condition. It weakened the negative STARA awareness–innovative work behavior relationship ($\beta=0.167$, $p<.001$; $\Delta R^2=0.024$) and strengthened the positive relationships of digital work self-efficacy ($\beta=0.164$, $p<.001$; $\Delta R^2=0.026$) and digital organizational citizenship behavior ($\beta=0.230$, $p<.001$; $\Delta R^2=0.050$). This is consistent with work design theory, which emphasizes employees' discretion over work methods and experimentation [35], [36].

Overall, the results suggest a digital leadership innovation activation mechanism, wherein threat reduction, capability building, and digital collaboration represent three parallel employee-level pathways, and autonomy facilitates their transformation into innovative behavior. This integrated mechanism is depicted in Figure 3.

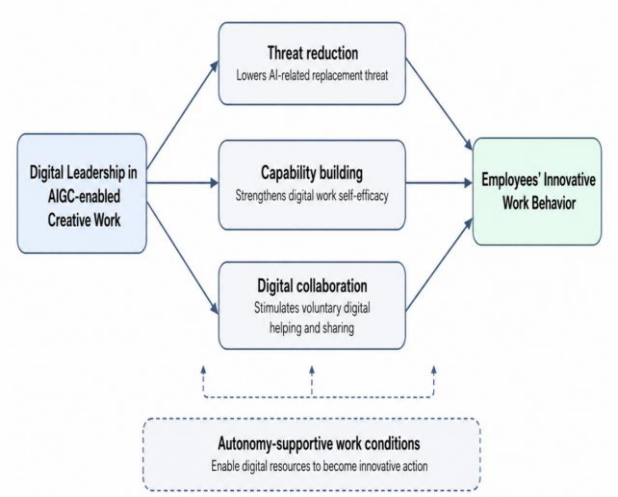


Fig. 3: Digital Leadership Innovation Activation Mechanism
Source: created by the authors

6 Conclusion

This study examined how digital leadership is associated with employees' innovative work behavior in AIGC-enabled creative design enterprises in Chongqing, China. Based on qualitative interviews with 25 participants, a pilot test with 116 valid responses, and a formal survey of 516 employees, the findings supported all 13 hypotheses. Digital leadership was positively associated with innovative work behavior, digital work self-efficacy, and digital organizational citizenship behavior, while being negatively associated with STARA awareness. STARA awareness was negatively associated with innovative work behavior, whereas digital work self-efficacy and digital organizational citizenship behavior were positively associated with it. The three mediating mechanisms jointly accounted for 75.9% of the total effect, and work autonomy significantly moderated all three mediator–outcome relationships.

Overall, the findings indicate that employee innovation in AIGC-enabled creative work is not an automatic consequence of digital transformation. Digital leadership is more strongly associated with innovative work behavior when employees experience lower AI-related replacement threat, greater confidence in handling digital work, stronger voluntary digital collaboration, and sufficient discretion to experiment with new approaches. The study therefore provides an employee-level explanation of how leadership, digital technology perceptions, work-related capabilities, discretionary digital behavior, and autonomy jointly relate to innovation in creative design enterprises.

7 Implications of the Study

Theoretically, this study extends digital leadership research by identifying three complementary employee-level mechanisms—threat reduction, capability building, and digital collaboration—through which digital leadership is associated with innovative work behavior. Recent evidence similarly indicates that digital leadership can foster employee creativity and innovative performance through employee-level psychological and behavioral mechanisms, including innovation self-efficacy, knowledge sharing, and job crafting [40], [41]. It further shows that work autonomy functions as an enabling boundary condition, strengthening the translation of digital confidence and voluntary digital collaboration into innovative behavior while buffering the negative effect of STARA awareness.

Practically, creative design enterprises should treat AIGC adoption as both a technological and managerial issue. Leaders should reduce unnecessary AI-related replacement concerns, strengthen employees' digital work self-efficacy through training and peer learning, encourage voluntary sharing of prompts, templates, plug-ins, and workflow knowledge, and provide bounded autonomy by maintaining clear project standards while allowing discretion over tools, methods, and experimentation [42], [43].

8 Limitations and Future Research

This study has several limitations. The cross-sectional and self-reported design limits causal inference, although common method bias tests indicated that method variance was not severe. Future studies may strengthen temporal and source separation through longitudinal, multi-wave, or multi-source designs. Second, the sample was drawn from creative design firms in Chongqing, which may constrain the generalizability of the findings to other regions and industries.

Future research may compare different regional and industrial contexts, incorporate supervisor-rated or project-level innovation outcomes, and examine additional boundary conditions such as psychological safety, task complexity, and generative AI proficiency [44]. It may also test theoretically justified nonlinear relationships using polynomial regression, identify heterogeneous employee profiles through latent profile analysis, and assess potential endogeneity through longitudinal or instrumental-variable approaches when valid external instruments are available.

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Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the author(s) utilized artificial intelligence (AI) technologies solely for the purpose of linguistic refinement and grammatical correction. Following the application of these tools, the author(s) comprehensively reviewed, verified, and edited the resulting text. The author(s) maintain full accountability and responsibility for the accuracy, integrity, and final content of the publication.

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