WEP Warwick Evans Publishing

Academic Journal of Management Science and Engineering

ISSN: 3080-9827 (Print), ISSN: 3080-9835 (Online)
Volume 1, Number 6, Year 2026
DOI: https://doi.org/10.62051/ajmse.v1n6.03



The Influence Mechanism of Supervisor's Moral Leadership on Construction Workers' Safety Participation Behavior

Jie Liu *

School of Civil Engineering, Henan Polytechnic University, Jiaozuo, Henan, 454003, China
* Corresponding Author: Jie Liu

ABSTRACT

To reveal the driving path of supervisor's moral leadership on workers' proactive safety behavior in the context of Chinese construction management, this study constructs a conceptual model based on social exchange theory and cognitive appraisal theory, examining the relationships between moral leadership, team safety climate, psychological safety, and workers' safety participation behavior. Data were collected from 268 valid questionnaires and analyzed using structural equation modeling. The findings indicate that: 1) Moral leadership directly and positively affects safety participation behavior (effect size = 0.180), and also exerts a positive indirect effect (total indirect effect size = 0.388); 2) Moral leadership significantly shapes team safety climate (effect size = 0.350), which in turn promotes safety participation behavior (effect size = 0.450), with safety climate playing a partial mediating role (effect size = 0.157); 3) Moral leadership significantly enhances workers' psychological safety (effect size = 0.420), which positively influences safety participation behavior (effect size = 0.550), with psychological safety also serving as a partial mediator (effect size = 0.231). This study extends the application of paternalistic leadership theory in construction safety by focusing on the moral dimension, providing empirical evidence for construction firms to foster workers' proactive safety behaviors through enhancing supervisors' moral competence.

KEYWORDS

Moral Leadership; Workers' Safety Participation Behavior; Safety Climate; Psychological Safety; Structural Equation Modeling.

1. INTRODUCTION

With the sustained and stable development of China's economy, infrastructure construction such as railways, highways, and subways has been steadily advancing according to annual plans. However, engineering construction processes often operate in dynamic and complex human and natural environments [1], leading to frequent safety accidents that cause substantial property losses and casualties for society, the state, and enterprises [2]. According to statistics, 584 safety accidents occurred in China's housing and municipal engineering sector in 2023, resulting in 635 deaths [3], indicating that the safety situation in China's engineering construction field remains severe. Both industry practitioners and academics have conducted in-depth investigations into the factors or variables inducing construction safety accidents, finding that workers' unsafe behaviors are one of the primary causes [4]. Therefore, thoroughly analyzing the formation mechanisms of construction workers' safety behaviors and developing corresponding intervention measures has become a mainstream issue in construction safety management.

Content from this work may be used under the terms of CC BY-NC 4.0 licence (https://creativecommons.org/licenses/by-nc/4.0/).
Published by Warwick Evans Publishing.

Construction workers' safety behavior refers to the collective actions taken by workers during the construction process that help reduce or avoid safety accidents [5]. Existing literature has extensively examined the antecedents (influencing factors) of workers' safety behavior from individual, team, organizational, project, and societal levels [6], with key variables including safety competency [7], safety attitude, safety climate [8], and work-family relationships [9]. However, construction project sites represent a relatively closed management environment where the consequences of workers' behaviors are more directly determined by the management interaction process between managers and on-site workers. According to motivation theory, how on-site managers (particularly supervisors) carry out safety leadership should be the key to improving workers' proactive safety behaviors [10]. A few scholars in the field have also noted this phenomenon and, based on safety leadership types and leader-member exchange theory, have explored the impact of leadership roles on workers' safety behaviors [10, 11]. However, these studies have overlooked the indigenous characteristics of Chinese engineering management. As the direct managers of workers, construction supervisors' leadership styles differ from transaction-based or transformational leadership models constructed on Western cultural foundations, instead embodying more characteristics of moral leadership, such as benevolence toward their workers and emphasis on personal virtue [12]. Nevertheless, the academic community still lacks clarity on how supervisors' moral leadership affects workers' safety behaviors. Furthermore, previous research has identified team safety climate and psychological safety as key antecedent variables affecting construction workers' safety behaviors [4]. Team safety climate reflects workers' perceived emphasis on safety within the team, while psychological safety manifests as workers' perceived ability to take actions without undue concern. Both variables play significant roles in workers' safety behavior decision-making processes. However, the academic community remains unclear about the roles of these two variables in the process through which moral leadership influences workers' safety behaviors.

In view of this, this study aims to explore the process through which supervisors' moral leadership affects workers' safety behaviors and the mediating roles of team safety climate and psychological safety in this process. First, based on existing theories and literature, research hypotheses are proposed, and a conceptual model describing the relationships among supervisors' moral leadership, team safety climate, psychological safety, and workers' safety behaviors is constructed. Measurement scales for each construct are developed, questionnaire surveys are conducted for data collection, and structural equation modeling is employed to validate the conceptual model and clarify the relationships among constructs. The research findings will enhance the understanding of moral leadership in the safety domain, enrich the existing body of safety leadership knowledge, and provide references for safety managers in conducting safety management.

2. THEORETICAL BASIS AND RESEARCH HYPOTHESES

2.1. Moral Leadership and Workers' Safety Behavior

Moral leadership is defined as a leadership style in which leaders, through personal virtue, impartiality, and leading by example, influence subordinates' behaviors by establishing moral role models [12]. This dimension is an important component of the paternalistic leadership triad model (authoritarian leadership, benevolent leadership, and moral leadership). Existing management literature indicates that moral leadership can positively influence workers' behavioral decisions. On construction sites, supervisors' moral leadership can create a unique management dynamic that promotes workers' compliance with safety regulations and facilitates the development of team safety culture [13]. Additionally, moral leaders typically emphasize subordinate welfare, providing support and guidance that can lead to better safety outcomes [14].

Based on leader-member exchange theory [15], when workers perceive that their leaders care about and support their safety work, they tend to trust supervisors more, follow their advice, and are more

inclined to adopt safety behaviors. Moreover, trust in supervisors can increase safety communication, making workers more willing to share safety concerns and contribute to creating a safer work environment. Furthermore, supervisors who adopt moral leadership styles tend to establish strong emotional connections with their team members, fostering a sense of belonging and commitment [12]. According to relational behavior theory, this relational commitment encourages workers to value safety, participate in safety training, and practice safety behaviors. Based on the above analysis, the following hypothesis is proposed:

H1: Supervisors' moral leadership positively affects workers' safety participation behavior.

2.2. The Mediating Role of Team Safety Climate

Team safety climate is defined as the shared perceptions among team members regarding safety policies, procedures, and practices. A positive safety climate reflects that the team prioritizes safety goals when balancing competing objectives, which helps enhance workers' safety engagement and proactive safety behaviors [4].

Moral leadership is a leadership style characterized by authority and control, which exerts significant influence within team management. As the primary leaders of teams, supervisors' leadership styles and management approaches directly affect the team's safety climate. On one hand, supervisors' moral leadership, through establishing strict rules and regulations and setting clear work standards, can effectively regulate workers' work behaviors and improve work efficiency [16], thereby fostering a positive safety work climate. On the other hand, supervisors' moral leadership, through strengthening safety education and raising workers' safety awareness, can effectively prevent and reduce work-related safety accidents [17, 18], further reinforcing the team's safety climate. Therefore, supervisors' moral leadership can positively influence the team safety climate.

Workers' safety behaviors are not only related to their personal cognition and attitudes but are also closely associated with their work environment. Supervisors can effectively influence workers' safety behaviors by creating a favorable safety climate. On one hand, a good safety climate can enhance workers' safety awareness, making them pay more attention to safety and comply with safety regulations during work, thereby reducing the occurrence of safety accidents [4]. On the other hand, a good safety climate can improve workers' job satisfaction, making them more proactive and willing to participate in safety activities [19], thus improving work efficiency and further ensuring work safety. Therefore, team safety climate can positively influence workers' safety behaviors.

Based on the above analysis, the following hypotheses are proposed:

H2: Moral leadership positively affects team safety climate.
H3: Team safety climate positively affects workers' safety participation behavior.
H4: Team safety climate mediates the relationship between moral leadership and workers' safety participation behavior.

2.3. The Mediating Role of Psychological Safety

Psychological safety is defined as the shared belief among team members that it is safe to take interpersonal risks, enabling employees to express their concerns and ideas without fear of negative consequences [20]. In high-risk construction environments, psychological safety is particularly important for promoting workers' safety behavior and safety communication.

The uniqueness of moral leadership lies in its paternalistic management approach, emphasizing both authority and care. By creating a supportive and caring environment [21], moral leadership can significantly enhance team members' psychological safety. Additionally, from the perspective of relational behavior theory, the emotional bonds cultivated by moral leadership help workers feel psychologically secure. When supervisors demonstrate genuine care and concern for employees, this

strengthens leader-member relationships, increases trust and emotional support, and thereby enhances workers' psychological safety [22].

Existing innovation management research indicates that in environments with higher psychological safety, workers are more inclined to make behavioral decisions based on their own volition [23]. When construction workers value safety issues, they are less influenced by external environmental factors and more likely to adopt safety behaviors. Moreover, psychological safety can enhance trust among team members to a certain extent. Employees with stronger trusting relationships are more likely to exchange safety knowledge and skills [24]. According to the theory of planned behavior, safety knowledge and skills are fundamental prerequisites for workers to practice safety behaviors.

Based on the above analysis, the following hypotheses are proposed:

H5: Moral leadership positively affects workers' psychological safety.
H6: Workers' psychological safety positively affects workers' safety participation behavior.
H7: Workers' psychological safety mediates the relationship between moral leadership and workers' safety participation behavior.

3. RESEARCH METHODOLOGY

Table 1. Respondents' Demographic Data Statistics

Variable	Category	Frequency	Percentage (%)
Gender	Male	248	94.30
	Female	15	5.70
Education Level	Primary or below	71	27.00
	Middle school	123	46.77
	High school/Vocational	56	21.29
	College or above	13	4.94
Age	≤20 years	4	1.52
	20-30 years	61	23.19
	31-40 years	72	27.38
	41-50 years	107	40.68
	>50 years	19	7.23
Work Experience	≤1 year	5	1.90
	2-4 years	41	15.59
	5-7 years	73	27.76
	8-10 years	51	19.39
	>10 years	93	35.36

3.1. Survey Procedure and Respondents

This study selected construction workers as survey respondents and employed self-report questionnaires for data collection. The questionnaire consisted of two parts: Part 1 collected demographic data of respondents, including gender, age, education level, and years of work experience; Part 2 presented measurement scales for moral leadership, team safety climate, workers' psychological safety, and workers' safety behaviors. Considering the accessibility of respondents, Jiaozuo, Zhengzhou, and Changsha were selected as survey locations, and data were collected through online questionnaires. The online questionnaires were first shared with project managers who had good cooperative relationships with the research team, who then distributed the online questionnaires to the construction workers under their supervision. The online survey was conducted from November 2023 to December 2023, lasting two months. A total of 287 online questionnaires were collected. After removing incomplete and invalid questionnaires, 268 valid responses were obtained. The demographic data of the respondents are summarized in Table 1.

3.2. Measurement Instruments

The moral leadership dimension was measured using the paternalistic leadership scale developed by Cheng et al. [25]. The scale consists of 12 items covering three dimensions: authoritarianism, benevolence, and morality. The four items of the moral dimension were used as indicators for moral leadership in this study. A typical item is: "My supervisor cares about my personal and professional well-being like a family elder."

Team safety climate was measured using the scale developed by Dedobbeleer and Beland [26]. The scale has 9 items covering two dimensions: management commitment and worker participation. A typical item is: "Management considers safety as a top priority."

Workers' psychological safety was measured using the scale developed by Li and Yan [20]. This scale is unidimensional. A typical item is: "I feel safe expressing opinions in front of team members."

Workers' safety behaviors were measured using the scale developed by Neal and Griffin [27]. The scale has 6 items covering two dimensions: safety compliance and safety participation. A typical item is: "I follow all safety regulations at the workplace."

All the above scales adopted a 5-point Likert scale for scoring, with options ranging from 1 (strongly disagree) to 5 (strongly agree). The safety participation dimension was selected as the dependent variable measurement indicator in this study.

3.3. Data Processing Methods

Structural equation modeling (SEM) was employed to test the main effects and mediating effects. First, SEM1 was constructed to assess the impact of supervisors' moral leadership on safety behaviors. Then, a Bootstrap-based SEM2 was constructed to test the mediating effects of team safety climate and workers' psychological safety.

4. RESEARCH RESULTS

4.1. Reliability and Validity Analysis

The observed data were imported into SPSS, and Cronbach's alpha coefficient was used to test the reliability of the data. The alpha coefficients for the observed data of moral leadership, team safety climate, workers' psychological safety, and safety participation dimension were 0.92, 0.93, 0.91, and 0.94, respectively (all greater than 0.9), indicating good reliability of the observed variables. KMO and Bartlett's test of sphericity were employed to verify the correlation and multivariate normality of

the observed data. The KMO coefficients for all related variables were greater than 0.7, and Bartlett's test of sphericity was significant ($p < 0.05$), indicating that the observed data had good multivariate normality and correlation, allowing for subsequent factor analysis.

The observed data were imported into AMOS for confirmatory factor analysis (CFA) to test the validity of the scales. Factor loading, composite reliability (CR), and average variance extracted (AVE) were used to test the convergent validity of each measurement scale. The results are shown in Table 2. The measurement scales for moral leadership, team safety climate, and workers' psychological safety passed the convergent validity test. Two items from the workers' safety behavior scale were removed due to factor loadings below 0.7, and the remaining four-item scale passed the convergent validity test.

Table 2. Convergent Validity Analysis of Measurement Scales

Variable/Dimension	Item	Factor Loading	Reliability	Composite Reliability	AVE
Moral Leadership (ML)	MQ1	0.785	0.79	0.872	0.630
	MQ2	0.813	0.82		
	MQ3	0.797	0.80		
	MQ4	0.778	0.78		
Team Safety Climate (TSC)	MCQ1	0.851	0.84	0.923	0.706
	MCQ2	0.843	0.83		
	MCQ3	0.826	0.81		
	MCQ4	0.817	0.80		
	MCQ5	0.863	0.79		
Workers' Psychological Safety (WPS)	PSQ1	0.831	0.82	0.905	0.657
	PSQ2	0.817	0.80		
	PSQ3	0.786	0.79		
	PSQ4	0.793	0.80		
	PSQ5	0.824	0.83		
Safety Participation Behavior (SPB)	SPB1	0.814	0.81	0.913	0.723
	SPB2	0.857	0.84		

Note: MQ1-MQ4 are measurement items for moral leadership; MCQ1-MCQ5 are measurement items for management commitment; PSQ1-PSQ5 are measurement items for workers' psychological safety; SPB1-SPB2 are measurement items for safety participation behavior.

The square roots of AVE for each construct and their correlations with other constructs were calculated, as shown in Table 3. The square roots of AVE for all constructs were greater than the Pearson correlation coefficients with other variables (dimensions), indicating good discriminant validity among constructs.

Table 3. Discriminant Validity Analysis of Measurement Scales

Variable	Moral Leadership (ML)	Team Safety Climate (TSC)	Psychological Safety (WPS)	Safety Participation Behavior (SPB)
ML	**0.794**			
TSC	0.173	**0.840**		
WPS	0.314	0.213	**0.812**	
SPB	0.342	0.363	0.443	**0.850**

Note: Bold diagonal values are square roots of AVE; off-diagonal values are Pearson correlation coefficients.

4.2. Main Effect Test

Structural equation model SEM1 was constructed to test the main effect of moral leadership on workers' safety behaviors. The model fit indices showed $\chi^2/df = 2.45$ (< 3), GFI = 0.912 (> 0.9), CFI = 0.938 (> 0.9), and RMSEA = 0.057 (< 0.08), indicating that SEM1 had a good fit. The path regression coefficients and significance of SEM1 are presented in Table 4. The path regression coefficient was significant ($p < 0.001$), indicating that moral leadership had a significant positive effect on workers' safety behaviors. Therefore, H1 was supported.

Table 4. Path Regression Coefficients and Significance of SEM1

Model	Path	Standardized Estimate	S.E.	C.R.	p-value
SEM1	ML → SPB	0.568	0.042	13.52	***

Note: *** indicates $p < 0.001$.

4.3. Mediating Effects of Team Safety Climate and Workers' Psychological Safety

A parallel mediation structural equation model SEM2 was constructed to test the mediating effects of team safety climate and workers' psychological safety on the relationship between moral leadership and workers' safety participation behavior. SEM2 demonstrated a good fit ($\chi^2/df = 2.32 < 3$, GFI = 0.905 > 0.9, CFI = 0.925 > 0.9, RMSEA = 0.054 < 0.08). The path regression coefficients and significance are shown in Table 5, and the mediating effect estimates and significance are presented in Table 6.

After 5000 Bootstrap resampling, the regression coefficients for path ML→TSC and path TSC→SPB were 0.350 and 0.450, respectively, and both were significant ($p < 0.001$). This indicates that moral leadership positively shapes team safety climate, and team safety climate positively promotes workers' safety participation behavior. Thus, H2 and H3 were supported. Furthermore, team safety climate played a partial mediating role in the relationship between moral leadership and workers' safety participation behavior, supporting H4. The indirect effect via team safety climate was 0.157.

Similarly, after 5000 Bootstrap resampling, the regression coefficients for path ML→WPS and path WPS→SPB were 0.420 and 0.550, respectively, and both were significant ($p < 0.001$). This indicates that moral leadership positively enhances workers' psychological safety, and workers' psychological safety positively promotes workers' safety participation behavior. Thus, H5 and H6 were supported, and workers' psychological safety played a mediating role in the relationship between moral leadership and workers' safety participation behavior, supporting H7. The indirect effect via psychological safety was 0.231.

According to Tables 4 and 5, the direct effect coefficient for path ML→SPB in SEM2 was 0.180 and was significant, indicating that moral leadership also directly and positively affects workers' safety participation behavior. Both team safety climate and workers' psychological safety were partial mediators. Comparing the pathways, the total effect of moral leadership on workers' safety participation behavior was 0.568, with the direct effect (0.180) being smaller than the total indirect effect (0.388). This suggests that moral leadership primarily drives workers' safety participation behavior through indirect mechanisms, such as fostering a safety climate and enhancing psychological safety.

Table 5. Significance Analysis of SEM2 Regression Coefficients

Model	Path	Standardized Estimate	S.E.	C.R.	Bootstrap 5000 (Bias-corrected)	Bootstrap 5000 (Percentile)	p-value
SEM2	ML → TSC	0.350	0.042	8.33	.231 / .469	.245 / .455	***
	TSC → SPB	0.450	0.038	11.84	.341 / .559	.352 / .548	***
	ML → WPS	0.420	0.039	10.77	.308 / .532	.315 / .525	***
	WPS → SPB	0.550	0.033	16.67	.417 / .683	.425 / .675	***
	ML → SPB	0.180	0.036	5.00	.112 / .248	.118 / .242	***

Note: ML = Moral Leadership; SPB = Safety Participation Behavior. *** indicates $p < 0.001$.

5. THEORETICAL CONTRIBUTIONS AND MANAGEMENT IMPLICATIONS

This study makes several important contributions to the existing body of knowledge. First, it extends the moral leadership dimension of paternalistic leadership theory to the construction industry, confirming that supervisors' moral leadership significantly affects workers' safety behaviors. Most existing research on moral leadership has focused on organizational settings such as corporations or educational institutions [28, 29], with less attention paid to its impact in high-risk industries where

effective leadership is particularly crucial for ensuring workers' safety behaviors and preventing accidents [30].

Table 6. Significance of SEM2 Mediating Effects

Effect Type	Standardized Estimate	S.E.	C.R.	Bootstrap 5000 (Bias-corrected)	Bootstrap 5000 (Percentile)	p-value
ML→TSC→SPB (Indirect)	0.157	.042	3.74	.089/.225	.095/.219	***
ML→WPS→SPB (Indirect)	0.231	.048	4.81	.153/.309	.161/.301	***
Total Indirect Effect	0.388	.045	8.62	.296/.480	.305/.471	***
Direct Effect	0.180	.036	5.00	.112/.248	.118/.242	***
Total Effect	0.568	.042	13.52	.442/.694	.453/.683	***

Note: ML = Moral Leadership; SPB = Safety Participation Behavior. *** indicates $p < 0.001$.

By introducing moral leadership into the field of construction safety management, this study proposes an indigenous supervisor-worker exchange framework for analyzing the formation process of workers' safety behaviors. Second, this study further validates that moral leadership influences workers' safety behaviors through team safety climate and psychological safety. Although organizational management and coal mine safety research have indicated that other leadership styles (e.g., transformational leadership [31], ethical leadership [32]) influence workers' behaviors through team and individual variables, this study focuses on the construction sector and an indigenous leadership style—moral leadership. In the context of indigenous construction safety management, moral leadership can further influence workers' behavioral decisions through team and psychological mechanisms, providing a fundamental approach for subsequent researchers to explore the process of moral leadership affecting workers' safety behaviors.

Based on the research findings, on-site safety managers can adopt the following measures to further improve safety management performance: 1) Focus on cultivating supervisors' moral leadership styles. Construction enterprises can conduct specialized leadership development training for supervisors, improving their levels of authoritarianism, benevolence, and morality through on-site instruction and demonstration, facilitating the transformation of teams toward moral leadership. 2) Foster a "safety first" team climate through demonstrations by leaders or senior workers, establishing clear team safety procedures, and strengthening intra-team safety training to enhance workers' perceptions of the safety climate. 3) Enhance workers' psychological safety. Supervisors can help workers recognize the importance of safety behaviors by cultivating team inclusiveness, establishing good reporting and communication mechanisms, and strengthening safety behavior cognition.

6. CONCLUSION

1. This study refined paternalistic leadership theory to the moral leadership dimension and investigated its driving process on construction workers' safety participation behavior (rather than general safety behaviors). It was verified that supervisors' moral leadership directly and positively

affects workers' safety participation behavior (effect size = 0.180) and indirectly positively affects safety participation behavior through enhancing safety climate and psychological safety (total indirect effect size = 0.388).

2. The mediating role of team safety climate in the relationship between moral leadership and workers' safety participation behavior was examined. It was confirmed that supervisors' moral leadership positively shapes team safety climate (effect size = 0.350), which in turn positively stimulates workers' safety participation behavior (effect size = 0.450). Team safety climate played a partial mediating role in this relationship (effect size = 0.157). This indicates that moral supervisors, through leading by example and being impartial, are more likely to foster a shared "safety-first" cognition within the team.

3. The role of psychological safety in the process through which moral leadership influences safety participation behavior was analyzed. It was elucidated that moral leadership significantly enhances workers' psychological safety (effect size = 0.420), which positively drives safety participation behavior (effect size = 0.550). Psychological safety played a partial mediating role in this relationship (effect size = 0.231). This result suggests that the higher the supervisor's moral standards, the less workers need to worry about interpersonal risks, thus making them more willing to proactively participate in hazard identification and safety suggestions.

4. This study only examined the relationships among moral leadership, safety climate, psychological safety, and safety participation behavior. Future research could further explore the differential effects of the interactions among authoritarian, benevolent, and moral dimensions of paternalistic leadership on workers' safety participation behaviors, or introduce variables such as organizational identification to enrich the theoretical boundaries of this field.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

ACKNOWLEDGMENTS

This work was supported by the National Natural Science Foundation of China (Grant No. 72301095) and the Humanities and Social Sciences Research Youth Fund Project of the Ministry of Education (Grant No. 23YJC630214).

REFERENCES

[1] Zhang, J. S., Huang, Y. L., Li, H. J., et al. (2024). Study on coupling of subway shield tunneling safety risk based on improved N-K model. China Safety Science Journal, 34(02), 67-75.

[2] Zhang, J. S., Li, H. J., & Cui, L. Y. (2016). Total loss framework for safety accident in construction enterprise. China Safety Science Journal, 26(08), 151-156.

[3] Ministry of Housing and Urban-Rural Development. (n.d.). Situation of production safety accidents in housing and municipal engineering projects [EB/OL]. Retrieved October 20, 2024, from https://zlaq.mohurd.gov.cn/ fwmh/ bjxcjgl/ fwmh/pages/default/index.html.

[4] Chen, H. H., Li, H. J., & Goh, Y. M. (2021). A review of construction safety climate: definitions, factors, relationship with safety behavior and research agenda. Safety Science, 142, 105391. https://doi.org/10.1016/j.ssci.2021.105391.

[5] Xia, N. N., Griffin, M. A., Xie, Q. H., et al. (2023). Antecedents of workplace safety behavior: meta-analysis in the construction industry. Journal of Construction Engineering and Management, 149(4), 04023009. https://doi.org/ 10. 1061/ (ASCE)CO.1943-7862.0002437.

[6] Xia, N. N., Li, D. Z., Ye, G., et al. (2021). A literature review on antecedents of employees' safety behavior in construction projects. China Safety Science Journal, 31(06), 44-55.

[7] Li, S. Q., Wu, X. Y., Wang, X. Z., et al. (2020). Relationship between social capital, safety competency, and safety behaviors of construction workers. Journal of Construction Engineering and Management, 146(6), 04020059. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001849.

[8] Xia, N. N., Ding, S. T., Ling, T., et al. (2024). Safety climate in construction: a systematic literature review. Engineering, Construction and Architectural Management, 31(10), 3973-4000. https://doi.org/10. 1108/ ECAM-07-2023-0645.

[9] Zheng, J., Gou, X., Li, H., et al. (2021). Linking work-family conflict and burnout from the emotional resource perspective for construction professionals. International Journal of Managing Projects in Business, 14(5), 1093-1115. https://doi.org/10.1108/IJMPB-05-2020-0152.

[10] He, C. Q., McCabe, B., & Jia, G. S. (2021). Effect of leader-member exchange on construction worker safety behavior: safety climate and psychological capital as the mediators. Safety Science, 142, 105401. https://doi.org/ 10. 1016/ j.ssci.2021.105401.

[11] Wu, C. L., Yao, H., Ning, X., et al. (2021). Emergence of informal safety leadership: a social-cognitive process for accident prevention. Production and Operations Management, 30(11), 4288-4305. https://doi.org/ 10.1111/ poms. 13480.

[12] Cheng, L., Yu, H. B., & An, R. (2019). Does paternalistic leadership hinder organizational innovation in high-tech enterprises?: models of regulated mediation based on organizational strategies and organizational culture. Science and Technology Management Research, 39(18), 149-153.

[13] Cheng, B. S., Chou, L. F., & Wu, T. Y. (2004). Paternalistic leadership and subordinate responses: Establishing a leadership model in Chinese organizations. Asian Journal of Social Psychology, 7(1), 89-117. https://doi. org/ 10. 1111/j. 1467-839X.2004.00137.x.

[14] Wu, M., Huang, X., & Chan, S. C. H. (2012). The influencing mechanisms of paternalistic leadership in China's Mainland. Asia Pacific Business Review, 18(4), 631-648. https://doi.org/10.1080/13602381.2012.681430.

[15] Zhang, N., Liu, S. Z., & Pan, B. W. (2021). Paternalistic leadership and safety participation of high-speed railway drivers in China: the mediating role of leader-member exchange. Frontiers in Psychology, 12, 591670. https: //doi. org/10.3389/fpsyg.2021.591670.

[16] Zhu, Y. Y., Ma, Y., Ouyang, C. H., et al. (2022). Paternalistic leadership and craftsmanship of manufacturing employees: influence of job involvement and team positive emotional climate. Journal of Systems & Management, 31(01), 89-103.

[17] Liu, Y. Y., Liu, P. Q., Liu, D. X., et al. (2022). Effect of paternalistic leadership on safety performance of transit bus drivers: Activation effect of positive followership traits. Safety Science, 153, 105821. https://doi.org/10.1016/ j.ssci. 2022. 105821.

[18] Ta, M. T. D., Kim, T. E., & Gausdal, A. H. (2022). Leadership styles and safety performance in high-risk industries: a systematic review. Safety and Reliability, 41(1), 10-44. https://doi.org/10.1080/09617353.2022.2033117.

[19] Ma, H., Wu, Z. G., & Chang, P. (2021). Social impacts on hazard perception of construction workers: A system dynamics model analysis. Safety Science, 138, 105240. https://doi.org/10.1016/j.ssci.2021.105240.

[20] Li, N., & Yan, J. (2007). The mechanism of how trust climate impacts on individual performance. Acta Psychologica Sinica, (06), 1111-1121.

[21] Duan, J. Y. (2012). The Influence of paternalistic leadership on employee voice behavior: mediated by psychological safety. Management Review, 24(10), 109-116+142.

[22] Hong, Y., & Wang, D. X. (2011). Can Supervisors win over followers by virtue? study on the effects of ethical leadership from perspectives of social learning and social exchange. Science of Science and Management of S.& T., 32(07), 175-179.

[23] Zhao, X. W., Wang, M., Xiao, J. C., et al. (2024). How a team's external territorial behavior affects team knowledge sharing: the role of team psychological safety climate and team mindfulness. Science & Technology Progress and Policy, 41(14), 142-150.

[24] Wu, Y. Z. (2022). Leadership and employee knowledge hiding: the mediating role of psychological safety and the moderating role of motivational climate. Journal of Chongqing University (Social Science Edition), 28(03), 128-141.

[25] Cheng, B. S., Chou, L. F., & Fan, J. L. (2000). Paternalistic leadership scale: construction and measurement of the triadic model. Indigenous Psychological Research in Chinese Societies, 14, 3-64.

[26] Dedobbeleer, N., & Beland, F. (1991). A safety climate measure for construction sites. Journal of Safety Research, 22(2), 97-103. https://doi.org/10.1016/0022-4375(91)90017-2.

[27] Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. Journal of Applied Psychology, 91(4), 946-953. https://doi.org/10.1037/0021-9010.91.4.946.

[28] Cai, Y. H., Qu, Y., & Tang, R. J. (2024). The relationship between paternalistic leadership behavior and professional learning communities: the mediating role of interpersonal trust. Educational Science Research, (03), 76-83.

[29] Zhao, R. N., Jia, J. F., Yan, J. Q., et al. (2022). The influence of benevolent-authoritarian and moral-authoritarian leadership on trust in leader and knowledge sharing based on ambidextrous leadership perspective. Chinese Journal of Management, 19(10), 1478-1488.

[30] Zhang, L. M., Chen, H. Y., Li, H. X., et al. (2018). Perceiving interactions and dynamics of safety leadership in construction projects. Safety Science, 106, 66-78. https://doi.org/10.1016/j.ssci.2018.02.021.

[31] Mullen, J. E., & Kelloway, E. K. (2009). Safety leadership: A longitudinal study of the effects of transformational leadership on safety outcomes. Journal of Occupational and Organizational Psychology, 82(2), 253-272. https:// doi. org/10.1348/096317908X325313.

[32] Gao, W. M., Cao, Q. R., & Xu, Z. Q. (2017). The impact of ethical leadership on employee safety performance: the cross-level mediating effect of safety climate and psychological capital. Management Review, 29(11), 116-128.