

Original Research Article

Environmental empowering leadership and environmental citizenship: The role of psychological empowerment

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Abstract: This study, based on Social Information Processing Theory, constructs a moderated mediation model to investigate how environmental empowering leadership influences employees' organizational citizenship behavior for the environment through green psychological empowerment and green human resource management. Analysis of 308 questionnaires reveals that environmental empowering leadership has a significant positive impact on employees' pro-environmental behavior, with green psychological empowerment acting as a mediating factor in this relationship. Additionally, green human resource management serves as a moderator between leadership behavior and psychological empowerment. The findings provide important theoretical support and managerial insights for organizations in their environmental management practices.

Keywords: environmental empowering leadership; green psychological empowerment; green human resource management; organizational citizenship; behavior for the environment

1. Introduction

As the world faces climate - change challenges, enterprise sustainable development relies on employee participation. Organizational citizenship behavior for the environment, voluntary actions benefiting the environment beyond formal duties, is key for organizations to achieve sustainability. With deeper exploration, the effectiveness of environmental empowering leadership, which stimulates pro - environmental behaviors, needs further investigation. It's a leadership style that influences employees' environmental awareness and behavior by granting decision - making power and autonomy, and removing implementation barriers. Existing research shows it can create motivation through green psychological empowerment.

Social Information Processing Theory, emphasizing external social information's influence on employee behavior, provides the theoretical basis. Environmental empowering leadership conveys the organization's environmental values, shaping employees' identity and motivation. Leaders can create an informational ecosystem through psychological empowerment, enabling employees to internalize environmental information and participate in pro - environmental actions. Green human resource management moderates, enhancing message credibility and psychological empowerment.

This paper aims to explore how environmental empowering leadership influences employees' environmental organizational citizenship behavior through psychological empowerment, analyze the mediating role, and investigate the moderating effect of green human resource management. It seeks to provide theoretical and practical guidance for enterprises' green governance, enhancing employees' participation and environmental responsibility for sustainable development.

2. Literature review and hypothesis development

2.1. Environmental empowering leadership and organizational citizenship behavior for the environment

Environmental empowering leadership is a specialization in environmental management. It promotes employees' pro - environmental behaviors by giving decision - making authority, autonomy, and showing confidence in their environmental capabilities, thus removing implementation barriers. Different from traditional

empowering leadership, it focuses on environmental management and emphasizes employee support and empowerment. Early research studied the relationship between empowering leadership and employee behaviors, showing it boosts autonomy and job satisfaction. Recent studies found it can enhance employees' environmental responsibility and performance through empowerment. These findings are valuable for our research.

From the Social Information Processing Theory perspective, employee behavior is constructed through interpreting and internalizing social information. Environmental empowering leadership creates an informational ecosystem by providing an environmental vision, a supportive atmosphere, and case studies, leading to proactive environmental organizational citizenship behavior. Based on this analysis, we propose the following hypothesis:

H1: Environmental empowering leadership has a positive direct impact on organizational citizenship behavior for the environment.

2.2. The mediating role of green psychological empowerment

Green psychological empowerment is the intrinsic motivation individuals gain in environmental activities through perceptions of autonomy, competence, meaning and impact. It combines psychological empowerment theories with pro - environmental behavior research to stimulate sustainable development. Social Information Processing Theory says individual behaviors form through information processing. In environmental organizations, environmental empowering leadership affects employees' green psychological empowerment via social information, driving pro - environmental organizational citizenship behavior. When employees recognize the importance of environmental work and connect it with personal values, they're more likely to engage in environmental behaviors. Leaders enhance employees' professional confidence through training, making them more likely to take spontaneous pro - environmental actions. Leaders influence employees' green psychological empowerment through vision communication, competency training and participative decision - making, leading to actual actions. This aligns with the theory as employees internalize pro - environmental information through green psychological empowerment, spurring extra - role behaviors. Therefore, we propose the following hypotheses:

H2: Environmental empowering leadership has a positive impact on green psychological empowerment.

H3: Green psychological empowerment mediates the relationship between environmental empowering leadership and organizational citizenship behavior for the environment.

2.3. The moderating role of green human resource management

According to Social Information Processing Theory, green human resource management (GHRM), as an organizational - level institutional arrangement, moderates the relationship between environmental empowering leadership and green psychological empowerment. GHRM creates a social information ecosystem that affects individuals' psychology and behavior. Through practices like recruitment, training, and performance management, GHRM strengthens the signal of environmental empowering leadership. Green training equips employees with skills and knowledge, facilitating the internalization of leadership empowerment information and the formation of green psychological empowerment. Green performance evaluations and compensation systems support the influence of environmental empowering leadership by including environmental performance in assessment criteria, incentivizing employees' green psychological empowerment. Social Information Processing Theory shows that GHRM amplifies and transforms the information from environmental empowering leadership into systemic information, enhancing its impact on employees' green psychological empowerment. Based on this, we propose the following hypothesis:

H4: Green human resource management positively moderates the relationship between environmental empowering leadership and green psychological empowerment.

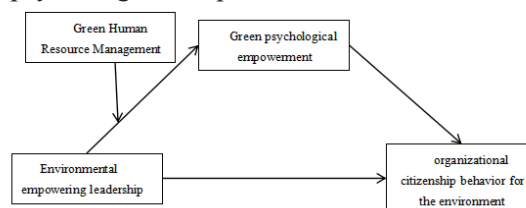


Figure 1. Theoretical model diagram.

3. Research method

3.1. Sample and method

This survey was conducted through the online professional data collection platform (www.credmo.com), which is one of the largest online questionnaire platforms in China. Participants were informed that they would complete the questionnaire via an online link and were provided with an information sheet detailing the research purpose, confidentiality commitment, and variable concepts. Data collection was carried out in three stages, with one-month intervals between each stage to reduce common method bias. After excluding invalid responses, a total of 308 valid questionnaires were obtained.

3.2. Measurement tools

Environmental empowering leadership. It was measured using the scale developed by Badar et al with a Cronbach's alpha coefficient of 0.918.

Green psychological empowerment. It was measured using the scale developed by Spreitzer with a Cronbach's alpha coefficient of 0.892.

Green human resource management. It was measured using the scale developed by Dumont et al with a Cronbach's alpha coefficient of 0.899.

Organizational Citizenship Behavior for the Environment. It was measured based on the scale by Boiral^[4] with a Cronbach's alpha coefficient of 0.880.

4. Data analysis and results

4.1. Common method bias test

In this study, we used Harman's single-factor test to assess the degree of common method bias. All items were input into a non-rotated principal component factor analysis. The results showed that a factor with an eigenvalue greater than 1 was extracted, with the maximum factor variance explanation rate being 35.277%. Therefore, we can conclude that there is no significant common method bias in this study.

4.2. Confirmatory factor analysis

This study utilized SPSS 26.0 and AMOS software to test the proposed model. When the fit indices of the baseline model were satisfactory ($\chi^2/df < 3$, RMSEA < 0.08 , CFI, TLI > 0.9 , SRMR < 0.08), it was determined that the variables exhibited good convergent validity. As shown in Table 1, the four-factor model outperformed other factor models in all metrics ($\chi^2 = 1432.467$; $df = 734$; $\chi^2/df = 0.952$; RMSEA = 0.056; CFI = 0.896; IFI = 0.897; TLI = 0.890). The results for the four-factor model were within a reasonable range, indicating that the four types of variables in our study could be effectively distinguished, allowing for subsequent data analysis.

Table 1. Results of confirmatory factor analysis.

Models	χ^2	df	χ^2/df	RMSEA	CFI	IFI	TLI
Four-factor(full model)	1432.467	734	1.952	0.056	0.896	0.897	0.890
Three-factor	1505.715	737	2.043	0.058	0.886	0.886	0.879
Two-factor	1524.958	739	2.064	0.059	0.883	0.884	0.877
One-factor	1974.072	740	2.668	0.074	0.817	0.818	0.807

4.3. Correlation analysis

The purpose of the correlation analysis is to explore the relationships between the variables, as shown in **Table 2**. The results in **Table 2** indicate that environmental empowering leadership is significantly positively correlated with organizational citizenship behavior for the environment ($r = 0.724$, $p < 0.01$) and green psychological empowerment ($r = 0.752$, $p < 0.01$). Additionally, green psychological empowerment is also significantly positively correlated with organizational citizenship behavior for the environment ($r = 0.836$, $p < 0.01$). Furthermore, green human resource management shows significant positive correlations with environmental empowering leadership ($r = 0.838$, $p < 0.01$) and green psychological empowerment ($r = 0.690$, $p < 0.01$).

Table 2. Descriptive statistics and correlation analysis of variables.

Variables	M	SD	1	2	3	4
EEL	3.95	0.61	1			
GHRM	3.87	0.82	0.838**	1		
GPE	3.97	0.58	0.752**	0.690**	1	
OCBE	4.13	0.53	0.724**	0.662**	0.836**	1

Note: * indicates p<0.05; ** indicates p<0.01; N=308

4.4. Hypothesis testing

We used Model 4 from Hayes (2012) within the SPSS macro to test the mediating effect of green psychological empowerment on the relationship between environmental empowering leadership and organizational citizenship behavior for the environment while controlling for general variables. As shown in **Table 3**, the effect of environmental empowering leadership on organizational citizenship behavior for the environment is significant (B = 0.037, t = 17.366, p < 0.01). Even after including the mediating variable, the effect of environmental empowering leadership on organizational citizenship behavior for the environment remains significant (B = 0.041, t = 4.773, p < 0.01). The effect of environmental empowering leadership on green psychological empowerment is also significant (B = 0.039, t = 18.638, p < 0.01), and green psychological empowerment has a significant effect on organizational citizenship behavior for the environment (B = 0.042, t = 14.564, p < 0.01). Hypotheses H1 and H2 are thus supported.

Table 3. Results of hierarchical regression analysis.

Variables	OCBE		OCBE		GPE	
	B	t	B	t	B	t
Gender	0.034	-0.426	0.044	-0.708	0.046	-0.593
Age	0.036	0.019	0.047	-0.029	0.049	-0.068
Education	0.025	-1.612	0.032	-1.991	0.034	-1.168
Industry	0.005	1.314	0.006	0.226	0.007	-1.218
EEL	0.041	4.773***	0.037	17.366***	0.039	18.638***
GPE	0.042	14.564***				
R2	0.726		0.532		0.571	
F	113.366		56.958		66.688	

Note: * indicates p < 0.05; ** indicates p < 0.01; *** indicates p < 0.001.

As shown in **Table 4**, the direct effect of environmental empowering leadership on organizational citizenship behavior for the environment is 0.197, and the indirect effect through green psychological empowerment is 0.44. The Bootstrap 95% confidence interval's upper and lower limits don't include 0, indicating that environmental empowering leadership directly and indirectly promotes employees' organizational citizenship behavior for the environment, supporting Hypothesis H3. To test the moderating effect of green human resource management in Hypothesis H4, hierarchical regression analysis and SPSS Process Model 7 were used. The regression results showed that the interaction term's upper and lower limits don't include 0, indicating a significant effect.

Table 4. Direct effects, mediation effects, and moderation effects breakdown.

	Effect	BootSE	BootLLCI	BootULCI	Effect Proportion
Direct Effect	0.197	0.067	0.066	0.324	30.93%
Mediation Effect of GPE	0.440	0.072	0.312	0.592	69.07%
Moderation Effect of GHRM (Interaction Term)	0.1132	0.0347	0.0449	0.1815	

5. Conclusions and discussion

This study constructs a moderating mediation effects model based on social information processing theory to explore the impact of environmental empowering leadership on environmental organizational citizenship behavior. Results show environmental empowering leadership positively affects environmental organizational citizenship behavior, and leaders' environmental values and practices can shape employees' environmental

tendencies. Green psychological empowerment is an internal mechanism through which leaders indirectly promote environmental behavior. High - intensity green human resource management makes the impact of environmental empowering leadership more pronounced.

5.1. Theoretical significance

This study applies social information processing theory to environmental management, uncovering leadership's influence on environmental behavior. It establishes a link among "environmental empowering leadership," "green psychological empowerment," and "environmental organizational citizenship behavior," validating the theory's applicability and enhancing understanding of leadership mechanisms. It highlights psychological empowerment as a key motivator and introduces green human resource management as a moderating variable, which enhances leadership credibility and strengthens green psychological empowerment.

5.2. Practical significance

First, human resource departments can design specialized environmental empowering leadership training programs, incorporating empowerment and environmental concepts into leadership development. Managers can be given more decision - making authority and environmental responsibilities through structural empowerment and high - participation practices. Second, organizations should provide employees with more autonomy and decision - making power, support their initiative in environmental projects. Professional environmental training can enhance employees' sense of capability and encourage their participation in environmental organizational citizenship behaviors.

5.3. Limitations and future research directions

This study has limitations. The sample is mainly from Anhui Province, with a narrow selection. It only considers green psychological empowerment as a mediating variable, while individual environmental attitudes and awareness may also influence environmental behavior. Future research should incorporate more variables affecting environmental organizational citizenship behavior and conduct comparative analyses of employees' environmental protection behaviors in cities with different pollution levels.

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