



Green Inclusive Leadership and Pro-Environmental Behavior in Hotel Enterprises: The Moderating Roles of Green Psychological Climate and Job Autonomy

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ABSTRACT

This study seeks to explore the impact of green inclusive leadership on employees' pro-environmental behavior. It also examines how green psychological climate and job autonomy act as moderators. To assess the proposed model, data were collected from 452 full-time employees working in five-star hotels in Egypt, specifically within the Greater Cairo region. Data analysis was performed using WarpPLS 7.0 statistical software, utilizing PLS-SEM for the evaluation. Findings revealed that green inclusive leadership positively influences pro-environmental behavior. Additionally, the relationship between green inclusive leadership and pro-environmental behavior is strengthened by both a supportive green psychological climate and higher job autonomy. This study contributes to both theory and practice by expanding the understanding of green leadership through the introduction of green inclusive leadership and its impact on pro-environmental behavior in the hospitality industry. It also offers practical guidance for leaders and managers in these sectors, helping them foster organizational cultures that support sustainability, while providing insights for policy development to align sustainability goals with organizational missions and enhance corporate social responsibility initiatives.

KEYWORDS

Green inclusive leadership, pro-environmental behavior, green psychological climate, job autonomy, hotel enterprises.

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القيادة الخضراء الشاملة والسلوك البيئي بمؤسسات الفنادق: الأدوار المعدلة للمناخ النفسي الأخضر واستقلالية العمل

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الملخص

تسعى هذه الدراسة إلى استكشاف تأثير القيادة الخضراء الشاملة على السلوك البيئي للموظفين، وتحديدًا فحص كيفية تأثير المناخ النفسي الأخضر واستقلالية العمل على هذه العلاقة لتعزيز فعالية القيادة في تعزيز الاستدامة. لتقييم النموذج المقترح، تم جمع البيانات من 452 موظفًا بدوام كامل يعملون في الفنادق ذات الخمس نجوم، وتحديدًا داخل منطقة القاهرة الكبرى. تم إجراء تحليل البيانات باستخدام برنامج WarpPLS 7.0 الإحصائي، باستخدام PLS-SEM للتقييم. كشفت النتائج أن القيادة الخضراء الشاملة تؤثر بشكل إيجابي على السلوك البيئي للموظفين. بالإضافة إلى ذلك، يتم تعزيز العلاقة بين القيادة الخضراء الشاملة والسلوك البيئي من خلال المناخ النفسي الأخضر واستقلالية العمل. تساهم هذه الدراسة في توسيع فهم القيادة الخضراء من خلال تقديم القيادة الخضراء الشاملة وتأثيرها على السلوك المؤيد للبيئة في صناعة الضيافة والسياحة. كما تقدم إرشادات عملية للقادة والمديرين في هذه القطاعات، مما يساعدهم على تعزيز الثقافات التنظيمية التي تدعم الاستدامة، مع توفير رؤى لتطوير السياسات لمواءمة أهداف الاستدامة مع مهام المنظمة وتعزيز مبادرات المسؤولية الاجتماعية للشركات.

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الكلمات الدالة

القيادة الخضراء الشاملة، السلوك المناصر للبيئة، المناخ النفسي الأخضر، استقلالية العمل، مؤسسات الفنادق.

Introduction

The growing global emphasis on sustainable development has significantly raised environmental concerns, especially within industries like hospitality and tourism, which have considerable ecological impacts (Messerli *et al.*, 2019; Ni *et al.*, 2023; Raman *et al.*, 2023). As a result, the hospitality and tourism sectors are increasingly recognizing the importance of adopting pro-environmental practices to reduce their environmental footprints and contribute to broader sustainability goals (Ahmad *et al.*, 2024; Salama *et al.*, 2024). In this context, leadership is pivotal in guiding organizations toward sustainability (Begum *et al.*, 2022; Salama *et al.*, 2024; Abdel Majeed *et al.*, 2025). However, despite considerable research on leadership styles and their role in promoting sustainability, a significant gap remains in understanding how specific leadership approaches, such as green inclusive leadership, directly influence pro-environmental behavior among employees (Omarova & Jo, 2022; Boeske, 2023; Khairy *et al.*, 2024). Additionally, the moderating roles of individual and organizational factors, such as green psychological climate and job autonomy, in this relationship have been underexplored.

This study aims to address these gaps by exploring the interactions between green inclusive leadership, pro-environmental behavior, and the moderating roles of green psychological climate and job autonomy within five-star hotels. Green inclusive leadership, characterized by an inclusive and environmentally conscious approach (Quan *et al.*, 2022; Abdou *et al.*, 2023), is expected to significantly influence employees' pro-environmental behaviors. Furthermore, this research will examine how green psychological climate, which reflects the shared perceptions of environmental practices within an organization (Dumont *et al.*, 2017; Khan *et al.*, 2019), and job autonomy, which pertains to the degree of control employees have in shaping their work environment (Kubicek *et al.*, 2017; Zychová *et al.*, 2024), moderate this relationship. By examining these dynamics, the study aims to provide a deeper understanding of how leadership can effectively drive sustainability within the hospitality industry.

While previous studies have examined the link between leadership and sustainability, many have focused on general leadership styles without considering the unique contributions of green inclusive leadership. This style, which integrates inclusivity with environmental consciousness, remains underexplored in the literature (Bhutto *et al.*, 2021; Liu & Huang, 2024). Additionally, while factors such as psychological climate and autonomy are widely acknowledged in organizational behavior research, they are rarely examined in the context of green leadership and pro-environmental behavior. Most research within the hospitality and tourism sectors tends to focus on individual actions and attitudes toward sustainability (Lin *et al.*, 2022), often neglecting the organizational-level influences of leadership, climate, and autonomy. Thus, this study fills a critical gap by investigating how these factors interact to foster pro-environmental behavior and sustainability in the context of five-star hotels.

The primary objectives of this study are to: 1) examine the relationship between green inclusive leadership and pro-environmental behavior among employees of five-star hotels; 2) investigate the moderating role of green psychological climate in shaping this relationship; 3) explore the moderating effect of job autonomy on the relationship

between green inclusive leadership and pro-environmental behavior; and 4) provide actionable insights that can help hospitality organizations integrate green leadership practices more effectively. By addressing these objectives, the study aims to contribute to a deeper understanding of how leadership can foster sustainable behavior within these specific organizational contexts.

This study contributes to both theory and practice. Theoretically, it expands the understanding of green leadership by introducing green inclusive leadership and exploring its impact on pro-environmental behavior in the hospitality industry. The study also integrates organizational behavior theories and examines the moderating roles of green psychological climate and job autonomy, providing a deeper insight into the factors influencing sustainability practices. Practically, the findings offer valuable guidance for leaders and managers in the hospitality sector, helping them build organizational structures and cultures that promote pro-environmental behavior. The research also provides insights for policy development, aiding organizations in aligning sustainability goals with their mission and enhancing corporate social responsibility initiatives.

Literature review and hypotheses development

Underpinning theories

The impact of green inclusive leadership (GIL) on pro-environmental behavior, with moderating roles of green psychological climate and job autonomy—can be approached from two significant theoretical perspectives, Social Exchange Theory (SET) and Theory of Planned Behavior (TPB).

SET, developed by Blau (1964), is a sociological and psychological concept that explains social behavior in terms of the exchange of resources, whether tangible or intangible, between individuals or groups (Cook *et al.*, 2013). It posits that people engage in relationships based on the expectation of receiving rewards, such as companionship, support, or material goods, and minimizing costs, such as time, effort, or emotional strain (Gergen, 2012). Relationships are maintained as long as the perceived benefits outweigh the costs, and individuals continuously evaluate the balance of these exchanges. This theory highlights the idea of reciprocity, where both parties aim to achieve a fair balance, and suggests that people are motivated by self-interest, seeking to maximize their rewards and minimize their losses (Lawler & Thye, 2006; Sabatelli, 2022).

The TPB, developed by Ajzen (1991), is a psychological theory that explains human actions based on three key factors: attitudes, subjective norms, and perceived behavioral control (Trifiletti *et al.*, 2022; Lim & Weissmann, 2023). Attitudes refer to a person's positive or negative evaluation of the behavior, subjective norms involve the influence of others' beliefs and expectations, and perceived behavioral control reflects the individual's perception of their ability to carry out the behavior, which may be influenced by external factors. The TPB suggests that an individual's intention to perform a behavior is the most direct predictor of whether they will actually engage in that behavior (Conner, 2020). When people have favorable attitudes, perceive social support, and believe they have control over the behavior; they are more likely to intend to and ultimately perform the behavior.

Green inclusive leadership and pro-environmental behavior

A company's commitment to environmental responsibility is reflected in its adoption of the GIL model (Patwary *et al.*, 2023). As the primary influencers of organizational behavior, leaders play a crucial role in fostering pro-environmental attitudes, acting as role models for employees to follow (Thabet *et al.*, 2023; Ouariachi & Elving, 2020). The way organizations present their environmental policies can significantly shape public perceptions of climate change (Bhutto *et al.*, 2021). Furthermore, the leadership team's environmental strategy has a positive impact on GIL in a green climate (Javed *et al.*, 2019). Leadership style, as previous research suggests, strongly affects both organizational climate and GIL (Zhou *et al.*, 2018), with ethical leadership in sectors like higher education and healthcare being particularly beneficial for environmental outcomes (Saleem *et al.*, 2020).

Employees in industries such as tourism and hospitality exemplify creative approaches to environmental challenges. These workers contribute fresh ideas for achieving environmental goals, provide green solutions to improve company performance, and actively seek innovative ways to address ecological issues (Patwary *et al.*, 2023). GIL, as defined, represents green behavior that encompasses ecology-oriented innovation aimed at environmental protection (Aboramadan *et al.*, 2022; Thabet *et al.*, 2023). How an organization is led profoundly affects employees' thoughts, emotions, and perceptions of their work environment, aligning with the fourth component of the creation model (Tuan, 2020). While there is no conclusive evidence linking GIL with openness and accessibility in the tourism and hospitality sectors (Razzaq *et al.*, 2021), it is suggested that inclusive leadership can enhance perceptions of an organization's green climate. By setting clear green standards, empowering employees to take initiative, and defining achievable environmental goals, leaders can foster positive perceptions. Therefore, this study hypothesizes the following:

H1: Green inclusive leadership positively affects employees' pro-environmental behavior.

The moderating roles of green psychological climate and job autonomy

Social Exchange Theory suggests that individuals act based on the reciprocity principle—people engage in behaviors that benefit others with the expectation that they will receive something in return (Mitchell *et al.*, 2012; Cook *et al.*, 2013; Cropanzano *et al.*, 2017). In the context of GIL, if leaders demonstrate green behavior and create a supportive, inclusive environment, employees are likely to reciprocate with pro-environmental behaviors (Rogozińska-Pawelczyk, 2024). The green psychological climate which relates to environmental values and practices and job autonomy which gives employees freedom to act might moderate this exchange by enhancing the personal commitment of employees to engage in environmental practices (Naz *et al.*, 2023; Alshehri *et al.*, 2024; Rafiq & Xiuqing, 2024). Green psychological climate and job autonomy could strengthen employees' perceived value of pro-environmental behaviors, making the exchange more rewarding.

In addition, Theory of Planned Behavior argues that human behavior is driven by intentions, which in turn are influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen, 2020; Conner, 2020). In this context, green inclusive leadership could influence employees' attitudes towards pro-environmental behavior

by fostering a supportive, green-oriented workplace culture (Aboramadan *et al.*, 2022; Thabet *et al.*, 2023). Additionally, the green psychological climate could enhance employees' perceptions that pro-environmental behaviors are the "right" thing to do (Li *et al.*, 2023; Alshehri *et al.*, 2024), and job autonomy could increase their perceived behavioral control, making them feel more capable of acting on these intentions (Den Hartog & Belschak, 2012; Thompson & Prottas, 2006). Green psychological climate could strengthen the positive attitude toward environmental behaviors, and job autonomy could increase individuals' sense of control, making pro-environmental behavior more likely. Consequently, this study hypothesizes the following:

H2: Green psychological climate moderates the relationship between green inclusive leadership positively and employees' pro-environmental behavior.

H3: Job autonomy moderates the relationship between green inclusive leadership positively and employees' pro-environmental behavior.

The theoretical framework of the study is illustrated below in Figure (1).

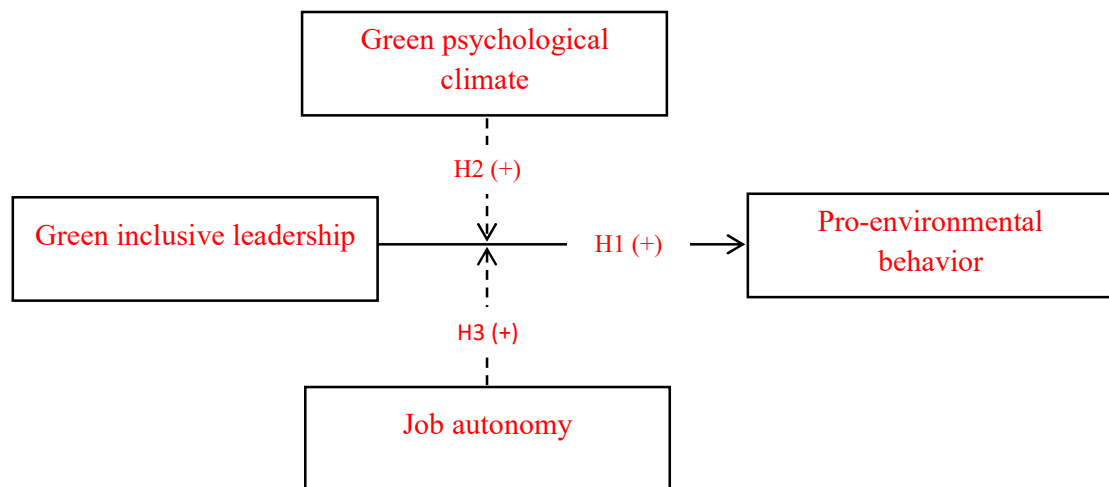


Figure (1): the theoretical framework of the study.

Methodology

Instrument Development and Measures

The study uses a quantitative survey method to examine four latent variables: green inclusive leadership, pro-environmental behavior, green psychological climate, and job autonomy. The original questionnaire was translated into Arabic and back into English to ensure accuracy. This back-translation technique enhances the reliability and validity of the questionnaire for Arabic-speaking participants.

This study used established and validated measures from previous research. Green inclusive leadership was assessed using a nine-item scale developed by Carmeliet *et al.* (2010), with items such as "The manager is open to hearing new pro-environmental ideas". In addition, pro-environmental behavior was measured using three items adapted from Bissing-Olson *et al.* (2013), including "I take a chance to get actively involved in environmental protection at work". Moreover, green psychological climate was evaluated with a 5-item scale suggested by Sabokro *et al.* (2021), such as "The organization has announced the general environmental policies

at the workplace”. Furthermore, job autonomy was assessed using a 4-item scale adapted from Hackman and Oldham (1975) and Nordin *et al.* (2024), with sample items like “I have fully complete responsibility for deciding how or when the work is to be done”.

Sampling and Data Collection

To evaluate the proposed model, data were gathered from full-time employees working in five-star hotels in Egypt, specifically within the Greater Cairo region. Five-star hotels in Egypt present a suitable population for investigating "green inclusive leadership and pro-environmental behavior" due to their prominent roles in the hospitality sector, which are critical to the country's economy and environmental impact. These types of enterprises are more likely to adopt and implement sustainable practices and green initiatives, as they cater to both local and international clients who are increasingly concerned about environmental sustainability. The employees within these organizations, particularly in leadership roles, are often at the forefront of integrating green practices, making them ideal subjects for exploring how leadership styles influence pro-environmental behaviors. Furthermore, five-star hotels typically have the resources and infrastructure to support green policies, as well as a high level of job autonomy among employees, which can significantly affect the implementation of green strategies. This makes them an ideal context for examining the moderating roles of green psychological climate and job autonomy in shaping pro-environmental behavior. In 2022, the Egyptian Ministry of Tourism and Antiquities reported that Greater Cairo hosted 30 five-star hotels (the Egyptian Ministry of Tourism and Antiquities, 2022).

For the sampling method, Cochran's (1963) sampling approach was employed, aiming for 385 responses as a representative sample, given the lack of official data on the total number of employees in five-star hotels. A total of 800 questionnaires were distributed to employees across 26 hotels that agreed to participate, using convenience sampling due to logistical limitations and the widespread locations of these businesses throughout Egypt. The response rate was 56.5%, yielding 452 valid questionnaires.

Data analysis

Data analysis was conducted using WarpPLS 7.0 statistical software, employing PLS-SEM, a method commonly used for theory validation in management research, particularly within the hospitality and tourism sectors. PLS-SEM was chosen due to its suitability for prediction-oriented models and handling complex relationships, especially when data normality cannot be assumed. To assess non-response bias, t-tests were performed, showing no significant differences between early and late responses ($p > 0.05$). Furthermore, Harman's single-factor test and principal component analysis were applied to evaluate common method variance, revealing that no single factor explained more than 50% of the total variance, suggesting minimal common method bias.

Results

Participants' profile

Table (1) presents the profile of 452 participants, detailing their gender, age, education, experience, and workplace. Of the participants, 69.9% were male and

30.1% were female. Age-wise, 33.6% were between 30 to 39 years, followed by 28.3% in the 18-29 age group. In terms of education, 64.6% had a bachelor's degree, 24.8% had completed high school or an institute, and 10.6% held a master's or PhD. Regarding work experience, 34.3% had 2 to 5 years of experience, while 24.8% had less than 2 years.

Table 1. Participants' profile (N=452).

		Frequency	Percent
Gender	Male	316	69.9
	Female	136	30.1
Age	18-< 30 years	128	28.3
	30 : < 40 years	152	33.6
	40: 50 years	110	24.3
	>50	62	13.7
Education	High schools or institute	112	24.8
	Bachelor	292	64.6
	Master/PhD	48	10.6
Experience	1< 2 years	112	24.8
	2 to 5 years	155	34.3
	6 to 10 years	104	23.0
	> 10 years	81	17.9

Measurement model

The assessment of the four-factor model included in this study was performed using Kock's (2021) ten fit indices, as presented in Appendix (A). The appendix presents various indices and their corresponding criteria for assessing model quality. The model's robust support is confirmed by all fit indices, confirming its usefulness in understanding the relationships among variables.

Table (2) data on the four constructs of the study and their associated indicators, including loadings, composite reliability (CR), Cronbach's alpha (CA), average variance extracted (AVE), and variance inflation factors (VIF). For GIL, the loadings of the indicators range from 0.541 to 0.843, with a CR of 0.912, CA of 0.890, and AVE of 0.538, while the VIF values are generally below the recommended threshold of 5, with the highest at 2.567. For PEB, the loadings range from 0.836 to 0.910, with a CR of 0.901, CA of 0.834, and AVE of 0.752, and the VIF is 3.195. GPC has loadings from 0.702 to 0.860, with a CR of 0.884, CA of 0.835, and AVE of 0.605, while the VIFs range from 2.913. JA shows loadings between 0.583 and 0.870, with a CR of 0.847, CA of 0.757, and AVE of 0.587, with a VIF of 3.055. All constructs meet the recommended thresholds for CR, CA, and AVE, indicating good reliability and validity, and the VIF values suggest that the model free of any multicollinearity issues.

Table 2. Item loadings, Cronbach alpha, CR, AVE, and VIFs

Construct	Indicators	Loading	CR	CA	AVE	VIF
Green inclusive leadership (GIL)	GIL.1	(0.764)	0.912	0.890	0.538	2.567
	GIL.2	(0.731)				
	GIL.3	(0.719)				
	GIL.4	(0.757)				

	GIL.5	(0.843)				
	GIL.6	(0.761)				
	GIL.7	(0.789)				
	GIL.8	(0.541)				
	GIL.9	(0.653)				
Pro-environmental behavior (PEB)	PEB.1	(0.836)	0.901	0.834	0.752	3.195
	PEB.2	(0.910)				
	PEB.3	(0.853)				
Green psychological climate (GPC)	GPC.1	(0.860)	0.884	0.835	0.605	2.913
	GPC.2	(0.825)				
	GPC.3	(0.782)				
	GPC.4	(0.702)				
	GPC.5	(0.708)				
Job Autonomy (JA)	JA.1	(0.726)	0.847	0.757	0.587	3.055
	JA.2	(0.852)				
	JA.3	(0.870)				
	JA.4	(0.583)				
“CR: Composite reliability; CA: Cronbach's alpha; AVE: average variance extracted; VIF: variance inflation factors “.						

Table (3) presents the discriminant validity results using the Fornell-Larcker criterion, which evaluates the distinctiveness of constructs by comparing the square root of the AVE for each construct to the correlations between constructs. The diagonal values represent the square root of the AVE for each construct, and they are all greater than the off-diagonal correlations, indicating acceptable discriminant validity. For instance, the square root of AVE for GIL is 0.733, which is greater than its correlations with PEB (0.657), GPC (0.714), and JA (0.659). Similarly, all other constructs show higher diagonal values than their respective correlations with other constructs, confirming that the constructs are sufficiently distinct from one another.

Table 3. Discriminant validity results - Fornell-Larcker Criterion

	GIL	PEB	GPC	JA
Green inclusive leadership (GIL)	0.733	0.657	0.714	0.659
Pro-environmental behavior (PEB)	0.657	0.867	0.735	0.631
Green psychological climate (GPC)	0.714	0.735	0.778	0.680
Job Autonomy (JA)	0.659	0.631	0.680	0.766

Table (4) presents the results for the Heterotrait-Monotrait (HTMT) ratios and their corresponding p-values, which are used to assess discriminant validity. The HTMT ratios indicate the strength of the relationship between constructs, with values below 0.90 considered acceptable, and below 0.85 considered ideal. All HTMT values in this table are below 0.90, ranging from 0.770 to 0.846, suggesting that the constructs are sufficiently distinct from each other. Additionally, the p-values for these HTMT ratios are all less than 0.001, indicating that the correlations between constructs are statistically significant. These results support the discriminant validity of the

constructs, as the HTMT ratios are within the acceptable range and the p-values meet the recommended threshold of <0.05 .

Table 4. HTMT for validity

HTMT ratios (good if < 0.90 , best if < 0.85)	GIL	PEB	GPC	JA
Green inclusive leadership (GIL)				
Pro-environmental behavior (PEB)	0.770			
Green psychological climate (GPC)	0.821	0.833		
Job Autonomy (JA)	0.838	0.846	0.846	
P values (one-tailed) for HTMT ratios (good if < 0.05)	GIL	PEB	GPC	JA
Green inclusive leadership (GIL)				
Pro-environmental behavior (PEB)	<0.001			
Green psychological climate (GPC)	<0.001	<0.001		
Job Autonomy (JA)	<0.001	<0.001	<0.001	

Results of testing hypotheses

Figure 2 and Table 5 provide a summary of the direct and moderating effects within the proposed relationships between green inclusive leadership, pro-environmental behavior, green psychological climate, and job autonomy. As illustrated in Figure 2, green inclusive leadership positively influences pro-environmental behavior ($\beta = 0.69$, $p < 0.01$), indicating that greater green inclusive leadership results in higher pro-environmental behavior among employees, thereby supporting H1. Additionally, the relationship between green inclusive leadership and pro-environmental behavior is moderated by both green psychological climate ($\beta = 0.10$, $p = 0.02$) and job autonomy ($\beta = 0.11$, $p = 0.01$). These results suggest that both green psychological climate and job autonomy strengthen the positive relationship between green inclusive leadership and pro-environmental behavior, thus supporting H2 and H3.

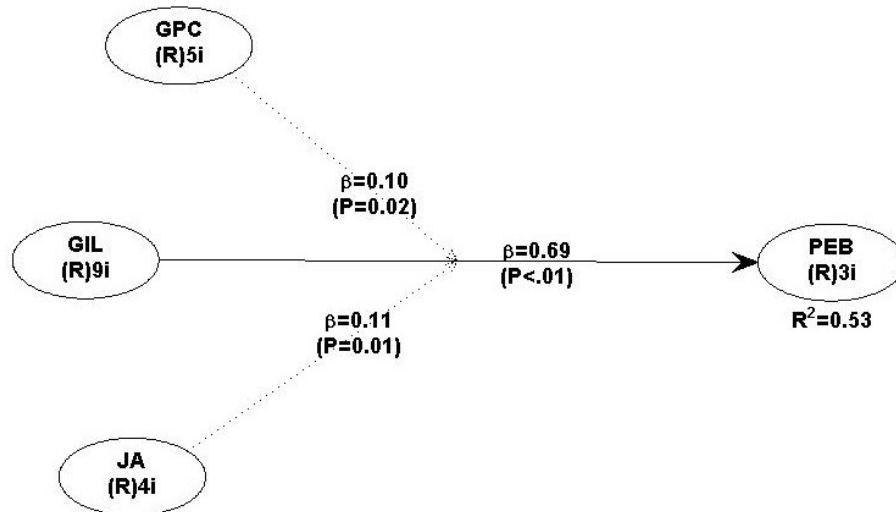


Figure 2: final model of the study

Table 5. Effect sizes (f^2) for total effects

Effect sizes (f^2) for total effects	GIL	GPC* GIL	JA* GIL
Pro-environmental behavior (PEB)	0.488	0.018	0.023

Table 5 displays the effect sizes (f^2) for the total effects on PEB. The f^2 values reflect the strength of the relationship between the predictors and the outcome variable. Based on Cohen's (1988) guidelines, effect sizes are interpreted as follows: an f^2 value of 0.02 or greater indicates a small effect, 0.15 or greater suggests a medium effect, and 0.35 or higher represents a large effect. In Table 6, the effect size for the relationship between GIL and PEB is 0.488, which is considered a large effect. The interaction between GIL and GPC shows an effect size of 0.019, classified as small. Similarly, the interaction between GIL and JA has an effect size of 0.023, also indicating a small effect.

Discussion

This study aims to examine the impact of green inclusive leadership on employees' pro-environmental behavior, with a focus on the moderating role of green psychological climate and job autonomy to improve this relationship. Findings revealed that green inclusive leadership improves employees' pro-environmental behavior. This is consistent with previous research of Patwary *et al.* (2023) which argued that green inclusive leadership has a significant and positive effect on employees' pro-environmental behavior. Leaders who practice this style create a work environment that encourages sustainability, fostering a sense of shared responsibility among employees. This leadership approach not only influences individual behavior but also helps drive organizational change toward more sustainable practices.

There are several mechanisms through which green inclusive leadership influences employee behavior. One key mechanism is green knowledge sharing, where inclusive leaders promote the exchange of information and ideas related to sustainability (Zhang *et al.*, 2025). This exchange helps employees become more informed about environmental issues and empowers them to act. Another mechanism is green creativity; when leaders create an inclusive environment, employees are more likely to generate creative solutions and ideas that contribute to sustainability initiatives (Asghar *et al.*, 2023; Murad & Li, 2025). Additionally, green work engagement plays a crucial role. Employees are more likely to engage in pro-environmental activities when they feel valued and included in decision-making processes about sustainability (Raza *et al.*, 2021). Finally, green inclusive leadership contributes to a positive organizational climate that reinforces pro-environmental behaviors (Thabet *et al.*, 2023; Rogozińska-Pawelczyk, 2024). This organizational culture supports and encourages employees to adopt environmentally friendly practices in their daily work.

Findings also revealed that green psychological climate and job autonomy positively moderates the relationship between green inclusive leadership positively and employees' pro-environmental behavior. These findings are interpreted by other research conducted by Bhutto *et al.* (2021), Alshehri *et al.* (2024), and Rafiq and Xiuqing (2024). A strong, positive green psychological climate can amplify the positive effects of green inclusive leadership. When employees perceive that their organization genuinely cares about the environment, they are more likely to respond positively to green inclusive leadership and be motivated to engage in pro-environmental behaviors (Bhutto *et al.*, 2021). In this environment, leadership actions are reinforced by the surrounding culture of sustainability. The organization's overall commitment to sustainability becomes a supportive backdrop that makes employees

more receptive to the leader's green initiatives (Robertson & Barling, 2013; Roscoe *et al.*, 2019). Conversely, if the green psychological climate is weak or negative, the impact of green inclusive leadership may be diminished. Employees who perceive that their organization is not truly committed to environmental responsibility may be less likely to trust or follow the leader's sustainability efforts. If they feel that the leadership's green initiatives are not supported by the organization, they may disengage from pro-environmental behaviors, undermining the potential positive effects of green inclusive leadership. In addition, a supportive green psychological climate provides an environment where green inclusive leadership can thrive (Bhutto *et al.*, 2021; Fang *et al.*, 2021). It strengthens the link between leadership actions and employee pro-environmental behavior, enhancing the likelihood that employees will engage in sustainability efforts. Therefore, organizations aiming to promote sustainability should focus not only on fostering green inclusive leadership but also on cultivating a strong, positive green psychological climate. This dual approach helps ensure that leadership initiatives are effectively supported and amplified by the overall organizational culture, leading to more sustainable practices in the workplace.

Lastly, job autonomy can play a key role in moderating the relationship between green inclusive leadership and employees' pro-environmental behavior. When employees have high job autonomy, they have the flexibility to implement pro-environmental practices in their own way, allowing them to take initiative and innovate in sustainability efforts (Pelletier & Aitken, 2014; Rafiq & Xiuqing, 2024). Green inclusive leadership provides direction and motivation, and autonomy enables employees to translate those into tangible actions, thus strengthening the positive effects of leadership on sustainability. However, when job autonomy is low, employees may feel constrained by rigid procedures and lack of control, limiting their ability to act on leadership's sustainability directives (Demircioglu, 2021). In such cases, the positive impact of green inclusive leadership may be weakened. Therefore, organizations that seek to enhance the effectiveness of green inclusive leadership should focus on providing employees with sufficient job autonomy to empower them to take ownership of sustainability initiatives and implement them more effectively.

Theoretical implications

The study significantly contributes to the expansion of green leadership theory by emphasizing the role of green inclusive leadership in fostering pro-environmental behavior. This leadership style, which integrates environmental concerns into organizational practices, is essential for creating a culture of sustainability. The research extends beyond traditional leadership theories, which focus on task-oriented and relational styles, by showing how leaders can actively involve employees in environmental decision-making, thus shaping organizational attitudes toward sustainability. This research enriches the understanding of leadership dynamics in promoting environmentally responsible behavior in organizations, particularly within the hospitality sector. Additionally, the research introduces the concept of green psychological climate, expanding the traditional psychological climate theory. The study highlights how employees' perceptions of an organization's environmental commitment can influence their own pro-environmental behaviors. By focusing on the environmental aspects of the workplace climate, this study provides valuable insights

into how fostering a positive perception of sustainability initiatives within an organization can motivate employees to engage in green behaviors. This theoretical extension offers a new perspective for organizations to create an environment that encourages sustainable practices.

This study also explores job autonomy as a moderating factor between green leadership and pro-environmental behavior, adding a new layer to job autonomy theory by applying it to sustainability. The findings show that when employees have the autonomy to make decisions related to sustainability, they are more likely to engage in pro-environmental behavior. This research broadens the understanding of job autonomy, suggesting that it is not just a driver of job satisfaction but also a critical enabler of green initiatives. Overall, the study contributes to organizational sustainability theory by emphasizing the importance of leadership, organizational climate, and employee autonomy in shaping environmental outcomes, offering a more holistic approach to sustainability.

Practical implications

The study emphasizes the importance of adopting green inclusive leadership in the hospitality industry, particularly for five-star hotels in Egypt. Managers should be trained to incorporate sustainability into decision-making, which can include setting clear environmental goals and modeling eco-friendly practices. By fostering a leadership style that actively prioritizes sustainability, businesses can create a culture of environmental responsibility, driving both organizational change and employee engagement in pro-environmental behaviors. The creation of a green psychological climate within organizations is another critical implication. Managers should work to cultivate an environment where sustainability is deeply embedded in the company culture. This involves regular communication of green policies, recognizing employees' contributions to sustainability efforts, and offering incentives for participation. When employees feel that their workplace values sustainability, they are more likely to align their own behaviors with the organization's environmental goals, leading to a more engaged and environmentally conscious workforce.

Lastly, enhancing job autonomy is a powerful tool for driving pro-environmental behaviors. Allowing employees more control over their work-related decisions, such as making sustainability-driven choices in operations or offering eco-friendly options to clients, can significantly improve environmental outcomes. By empowering staff with the freedom to contribute to sustainability efforts, organizations not only boost employee engagement and job satisfaction but also create a greater sense of ownership over the company's green initiatives. This approach can improve employee retention and serve as a competitive advantage in the growing eco-conscious market. Additionally, concrete managerial actions—such as increasing employee autonomy, implementing green communication platforms, or redesigning job roles need to be adopted to enhance green behavior.

Limitations and further research avenues

One limitation of this study is that it focuses solely on five-star hotels in Egypt, which may limit the generalizability of the findings to other sectors or regions with different cultural or organizational contexts. Additionally, the cross-sectional nature of the research means it cannot establish causal relationships between green leadership,

green psychological climate, job autonomy, and pro-environmental behavior. Future research could explore longitudinal studies to examine these relationships over time, as well as investigate other sectors or countries to compare how green leadership and sustainability practices are adopted in different cultural and industry contexts. Furthermore, examining additional factors, such as organizational size or employee demographics, could provide further insights into the drivers of pro-environmental behaviors in organizations.

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Appendix A. Model fit and quality indices		
Indices	Assessment	Criterion
Average path coefficient (APC)	0.298, $P < 0.001$	$P < 0.05$
Average R-squared (ARS)	0.529, $P < 0.001$	$P < 0.05$
Average adjusted R-squared (AARS)	0.526, $P < 0.001$	$P < 0.05$
Average block VIF (AVIF)	1.079	acceptable if ≤ 5 , ideally ≤ 3.3
Average full collinearity VIF (AFVIF)	2.723	acceptable if ≤ 5 , ideally ≤ 3.3
Tenenhaus GoF (GoF)	0.628	small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
Sympson's paradox ratio (SPR)	1.000	acceptable if ≥ 0.7 , ideally = 1
R-squared contribution ratio (RSCR)	1.000	acceptable if ≥ 0.9 , ideally = 1
Statistical suppression ratio (SSR)	1.000	acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	acceptable if ≥ 0.7