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How does green empowering leadership promote environmental performance? Unfolding the roles of green intrinsic motivation and green innovative work behavior

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ABSTRACT

Our study set out to investigate the linkage between green empowering leadership (GEL) and environmental performance (EnP) via the sequential mediation pathways of green intrinsic motivation and green innovative work behavior. We gathered data from 437 frontline hotel staff in the United Arab Emirates utilizing an online survey. The partial least squares structural equation modeling was performed for the assessment of hypotheses. All the hypotheses were supported, and the model we proposed was viable. Specifically, GEL enhanced EnP. Green intrinsic motivation and green innovative work behavior mediated the nexus between GEL and EnP in a serial manner. Our study augments the current literature appertaining to the consequences of GEL and the underlying mechanisms linking GEL to EnP. It also augments the green management knowledge base regarding the antecedents of EnP.

1. Introduction

The modern business environment is undergoing a paradigm shift towards sustainable development where hospitality firms increasingly recognize the necessity to integrate environmentally conscious practices into their core business strategies (Tabrizi et al., 2023). As the global community strives to deal with pressing environmental challenges, the role of businesses in mitigating their ecological footprint has become a focal point of academic inquiry and practical significance (Tanveer et al., 2024). The hospitality industry generates excessive quantity of waste and utilizes large amounts of resources, notably energy and water, which adversely impact the environment (Elkhwesky, 2022). Consequently, sustainable practices in hotels are essential for minimizing waste, satisfying environmentally conscious customers, enhancing public image, and promoting environmental performance (EnP) and sustainable competitiveness (Yang et al., 2023).

EnP denotes "…the commitment of firms to protect the environment and to demonstrate measurable operational parameters that are within the prescribed limits of environmental care" (Roscoe et al., 2019, p. 2). Although scholars have acknowledged the importance of hotel EnP (e.g., Raza and Khan, 2022), its influencing factors have not been thoroughly examined (Haldorai et al., 2022). Indeed, a systematic review by Elkhwesky (2022) highlights the necessity to explore the determinants of hotel EnP. Therefore, it is essential to provide novel perspectives on how to enhance EnP in the hotel sector (Abualigah et al., 2024).

Prior and recent studies have inclined to bring green leadership in the discourse surrounding strategies to enhance EnP (Aftab et al., 2022). For example, Riva et al. (2021) reported that green transformational leadership positively influenced EnP. Siddiquei et al. (2021) denoted that green servant leadership had a positive link with EnP. Hoang et al. (2021), in their review, highlighted that in the hospitality literature, the role of empowering leadership was subjected to limited inquiry. This is surprising because workers in this sector face unique challenges that shape their operations (Abualigah et al., 2023), which require

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independence and autonomy (Huertas-Valdivia et al., 2019). In view of this and owing to the green demands within hospitality settings (Karatepe et al., 2022), Badar et al. (2023) introduced the concept of green empowering leadership (GEL). GEL is defined as "a style characterized by the leader's encouragement of employees to speak up for pro-environmental concerns, participate in environment-related decisions and render help to employees in developing their pro-environmental skills" (Badar et al., 2023, p. 420). According to Badar et al. (2023), GEL constitutes a contemporary leadership approach in which the leader empowers staff members to voice environmental concerns, participate in environmental decision-making, and improve their pro-environmental competencies.

Although research on sustainability has progressed throughout the last years (Tandon et al., 2023), various important knowledge gaps remain in this emerging field, especially in the hospitality literature (Abualigah et al., 2024; Vu et al., 2025). This was also highlighted by Tanveer et al. (2023) who emphasized that the "literature on sustainability for the tourism and hospitality industry is underdeveloped" (p. 5). Therefore, recent papers have accentuated the need to research the mechanisms through which green leadership activates environmental outcomes (Hasan et al., 2024; Javed et al., 2024). In other words, research exploring the intervening variables on the connection between green leadership and green consequences is scarce (Abualigah and Badar, 2024; Zacher et al., 2024). Broadly speaking, Çop et al. (2021) disclosed that the linkage between green transformational leadership and green team resilience was mediated by green work engagement. Patwary et al. (2023) denoted that green human resource management (GHRM) mediated the link between green inclusive leadership and ecological behavior.

To address the abovementioned calls, we follow conservation of resources (COR) (Hobfoll, 1989, 2001) theory and self-determination theory (SDT) (Ryan and Deci, 2000) to investigate green intrinsic motivation (GIM) and green innovative work behavior as the serial mediators between GEL and EnP. Specifically, we investigate; (1) the linkage between GEL and EnP; (2) GIM as a mediator between GEL and EnP; (3) green innovative work behavior as a mediator of the effect of GEL on EnP; and (4) GIM and green innovative work behavior as the serial mediators between GEL and EnP.

By exploring the abovementioned relationships, our research advances the current literature. *First,* with very few exceptions (Ahmed et al., 2024; Badar et al., 2023; Mankgele, 2025; Meirun et al., 2024), research on the effect of GEL on the promotion of environmental sustainability is scarce. Our paper differs from the work of Meirun et al. (2024) in terms of the hypothesized links, theoretical frameworks used for the development of hypotheses. While Meirun et al. (2024) gauged the direct effect of GEL on green creativity, our study assessed the direct impact of GEL on EnP. In addition, Meirun et al. (2024) examined the serial mediation of green learning orientation and green creative self-efficacy on the linkage between GEL and green creativity. Our paper, on the other hand, tested GIM and green innovative work behavior as the serial mediators between GEL and EnP. In addition, Meirun et al. (2024) used COR theory and resource-based view to develop hypotheses, while in our paper, COR theory and SDT were utilized for the development of hypotheses. Consistent with recent studies (Ahmed et al., 2024; Meirun et al.2024), we borrowed items from Badar et al. (2023) to operationalize GEL, an important green leadership style which has received little empirical attention regarding its mediators and consequences. In view of the information given above, the research model in our study is *novel* in which all the proposed hypotheses have not been previously examined. Therefore, our study augments the green management knowledge base appertaining to the mediators and outcomes of GELas well as antecedents of EnP. Such lacunas regarding the said associations are evident in Haldorai et al.'s (2025) recent meta-analysis.

Second, recent papers have stressed the need to explore the process by which leadership engenders environmental outcomes (Arici and Uysal, 2022; Javed et al., 2024; Zacher et al., 2024). Given the limited research appertaining to GIM (Abualigah and Badar, 2024; Tabrizi et al., 2023), we explore GIM as a mediator between GEL and EnP.

Third, considering the intricate and dynamic nature of service organizations (e.g., hotels) (Abualigah et al., 2023), multiple underlying mechanisms need to be investigated to gain a profound understanding on how green leadership can effectively promote sustainability (Bhutto et al., 2021; Janjua et al., 2024). With this realization, the current research fills in this lacuna by investigating the sequential mediation pathways of GIM and green innovative work behavior in the GEL-EnP nexus. Such novel sequential mediation pathways have not been tested before (Haldorai et al., 2025). Lastly, in congruence with recent research (Vatankhah et al., 2024), our paper responds to the sustainable development goals "9-industry, innovation, and infrastructure", "12-responsible consumption and production" and 13-climate actions" of the United Nations by exploring the previously mentioned associations.

2. Literature review and hypotheses

2.1. Theoretical underpinnings

The COR framework postulates that people seek to acquire, retain, and preserve useful resources, which may incorporate social, psychological, and personal resources that support goal attainment (Hobfoll, 1989, 2001). Furthermore, the theory suggests that resource accessibility stimulates workers to invest additional resources to maximize gains, referred to as "resource gain spirals" (Hobfoll et al., 2018). In other words, workers who have adequate resources would presumably employ a "proactive resource gain approach" whereby they stockpile additional resources and continue investing in activities that go beyond the minimum requirements (Halbesleben et al., 2014). However, workers are likely to employ a defensive "resource preservation approach" if they have limited resources (Stoverink et al., 2018). Resources in a social environment can move from one form to another through "resource caravans", leading to increased resource acquisition (Hobfoll, 2001).

Utilizing the COR, we propose that GEL is an important green resource that offers workers structural and social resources and green support and enables them to make green-related decisions. Employees' perceptions of the accessible resources enabled by GEL may encourage them to participate in eco-initiatives (Badar et al., 2023), promoting EnP. In addition, we followed the "resource caravans" pathway of the COR theory (Hobfoll, 2001) to postulate that GIM is a green variable transmitting the effect of GEL on EnP. This tenet posits that contextual/social resources (e.g., GEL) are crucial in forming employees' personal resources (e.g., GIM) (Luu, 2023) which may motivate them to engage in green tasks, leading to enhanced EnP. We also build on the "resource gain spirals" in the COR framework (Hobfoll et al., 2018) to contend that green innovative work behavior is an important mechanism relating GEL to EnP. That is, GEL triggers a resource gain spiral through offering employees plenty of resources, motivating them to accumulate further resources and reinvest these resources in extra-role green behaviors such as introducing novel solutions to address environmental issues, promoting EnP. Consequently, we followed the abovementioned tenets of the COR framework, namely "resource gain spirals" and "resource caravans" (Hobfoll et al., 2018) to explore the effect of GEL on EnP via GIM and green innovative work behavior in a sequential manner.

Prior writings have used the COR framework to elucidate the effect of green leadership on various outcomes in hospitality settings. For example, Aboramadan et al. (2021) used the COR theory to examine climate for green creativity as a mediator of the influence of green servant leadership on workers' green behaviors. Employing the COR theory, Tuan (2020) assessed green role identity as a mediator between green servant leadership and green creativity. Iftikhar et al. (2024)

leveraged the COR theory to gauge the link between green servant leadership, harmonious environmental passion, and environmental organizational citizenship behavior. In their study, Badar et al. (2023) used the COR framework to assess the influence of GEL on green creativity with green psychological climate as a moderator. Meirun et al. (2024) utilized the COR to explore the impact of GEL on green creativity via green creative self-efficacy and green learning orientation as mediators. Unlike previous studies, our paper extends the COR framework and hospitality literature by gauging the influence of GEL on EnP via the sequential mediating pathways of GIM and green innovative work behavior. Consequently, our model is *novel* in which all the hypotheses have not been examined so far.

The SDT is a theoretical umbrella for comprehending human motivation and psychological well-being (Ryan and Deci, 2000). It contends that individuals have three innate psychological needs: "autonomy", "competence", and "relatedness") (Deci et al., 2001). According to Deci and Vansteenkiste (2004), autonomy reflects "people's universal urge to be causal agents, to experience volition, to act in accord with their integrated sense of self"; competence denotes "people's inherent desire to be effective in dealing with the environment"; and relatedness emphasizes "the universal propensity to interact with, be connected to, and experience caring for other people" (p. 25). The SDT posits that the fulfillment of these needs boosts worker well-being and optimal functioning, stimulating greater intrinsic motivation and leading to better results (Deci et al., 2001; Saito et al., 2025). In the hospitality literature, the SDT has been used to gauge the effect of employee engagement on work outcomes (Karatape et al., 2018), the antecedents of career satisfaction (Shum et al., 2020), the influence of workplace spirituality on internal whistleblowing (Srivastava and Gupta, 2022), and the perceived workplace inclusion-intention to stay nexus (Kim et al., 2025). Our paper augments the hospitality knowledge base by utilizing the SDT to hypothesize that GIM is an important underlying mechanism linking GEL to EnP.

2.2. GEL and EnP

Companies have started to realize the significance of worker behavior in improving EnP (Aftab and Veneziani, 2024). Employee behaviors and their involvement in environmentally conscious activities that address environmental concerns are considered effective strategies for transforming an organization into one that prioritizes environmental sustainability by being ecologically responsible (Nisar et al., 2021). This would in turn improve EnP (Ahmed et al., 2021). Leadership is a crucial organizational approach for promoting EnP (Siddiquei et al., 2021). Although research has explored different "green" leadership approaches like transformational (Riva et al., 2021), inclusive (Aboramadan et al., 2022; Thabet et al., 2023), and servant leadership (Javed et al., 2024), empowering leadership has been ignored in this process (Badar et al., 2023). This is intriguing given the substantial role of this leadership style in hospitality settings (Hassi, 2019; Hoang et al., 2021), and past writings have revealed that empowering leadership appears to be more effective compared to other leadership styles (e.g., Huertas-Valdivia et al., 2019). Empowering leadership prioritizes the autonomy and independence of followers (Badar et al., 2023). In addition, empowering leaders establish a conducive environment that encourages the active involvement of workers to participate in the decision-making process (Meirun et al., 2024). Therefore, in view of the COR framework (Hobfoll, 1989), we contend that GEL could promote hotel EnP.

Following the tenet of "resource gain spirals", the reciprocal resource gain spiral develops in phases. It begins with resource investments (such as empowering leadership), followed by workers' perceptions regarding resource accessibility and their investment patterns in the acquired resources (Halbesleben and Wheeler, 2015). Therefore, the resources gained through empowering leadership, such as self-fulfillment and self-confidence, may function as a buffer against the possible defeat of resources resulting from authority-sharing and encourage managers to empower their subordinates (Badar et al., 2023; Hoang et al., 2021). The resource investment principle illustrates how workers are encouraged to accumulate resources for cultivating specific behaviors through empowering leadership, which is a source of resources (Meirun et al., 2024). That is, GEL may act as an eco-friendly resource by empowering staff members to make green decisions and improving their ability to contribute to green initiatives (Badar et al., 2023).

When GEL grants workers adequate eco-friendly resources like green knowledge, they may positively view these resources as investments in environmentally friendly activities. This is likely to incentivize workers to utilize these resources and actively participate in green tasks, thereby promoting EnP. Empirically, Riva et al. (2021) denoted a positive linkage between green transformational leadership and EnP. However, a small number of empirical pieces have gauged the effect of GEL so far (Badar et al., 2023; Meirun et al., 2024). These studies reported that GEL was positively associated with green creativity.

H1. GEL relates positively to EnP.

2.3. Green intrinsic motivation as a mediator

Intrinsic motivation reflects the innate desire that workers have to accomplish their work tasks because they derive personal interest, fulfillment, and pleasure from doing so (Kammeyer-Mueller et al., 2016). Intrinsic motivation is a psychological state through which workers are willingly to be involved in activities that bring them a deep sense of personal fulfillment and happiness (Faraz et al., 2021). Considering this, Li et al. (2020) broadened the scope of intrinsic motivation to the sustainability field and introduced GIM, which denotes "…the love, passion or interest for green and pro-environmental behavior that is driven by internal drive or rewards" (p. 3).

Utilizing the COR framework (Hobfoll, 1989, 2001), we surmise that GIM may mediate the impact of GEL on EnP. Specifically, in view of the "resource caravans" pathway, resources may be transferred from one source such as a job resource to another such as a personal resource (Luu, 2023), subsequently influencing workers' attitudes and behaviors (Ali et al., 2020). As convincingly discussed by Sung et al. (2020), workers who receive important resources convert them into other resources that are greatly valued in a specific situation, leading to improved outcomes. In this context, GEL ensures valuable resources such as participation in green decisions and developing green competencies (Meirun et al., 2024). Providing workers with abundant green resources is likely to produce personal sources (Hobfoll, 1989), such as a sense of competence and self-esteem, and instill green values and norms among subordinates. Workers in such an atmosphere are likely to be intrinsically motivated to support the firm's environmental agenda, thereby promoting EnP. By offering autonomy and independence to employees, GEL can foster a green culture where employees feel supported and valued in addressing and voicing their environmental concerns (Badar et al., 2023). This may encourage workers to be engaged in ecological activities and instill a sense of purpose and obligation to embrace environmentally friendly behaviors (Islam et al., 2023), ultimately leading to enhanced EnP.

In addition, the SDT contends that individuals have three psychological needs: "autonomy", "competence", and "relatedness" (Ryan and Deci, 2000). The theory also postulates that contextual/social factors (e.g., green leadership) nurture workers' intrinsic motivation (Ryan and Deci, 2000), which may positively influence organizationally valued outcomes. Specifically, GEL creates an environment where employees can participate in decision making and make critical environmentally related decisions. This would foster their sense of autonomy. Furthermore, GEL helps followers develop their skills and knowledge through coaching and guidance (Badar et al., 2023), boosting their competence. Lastly, through providing support and interacting with followers, GEL can enhance their feelings of relatedness. Therefore, we surmise that workers have heightened proclivity to develop eco-friendly

values/beliefs because of GEL. This is likely to fuel their GIM to behave in a manner that aligns with those values/beliefs such as displaying environmentally responsible behavior and deriving greater satisfaction and enthusiasm from engaging in eco-friendly tasks, thus promoting EnP.

Empirically, Li et al. (2020) illustrated that GIM mediated the impact of green transformational leadership on green creativity. Islam et al. (2023) reported that GIM mediated the impact of green psychological climate on workers' intentions to decrease food waste. Surprisingly, thus far no empirical research has explored the mediating influence of GIM on the GEL-EnP nexus.

H2. GIM mediates the effect of GEL on EnP.

2.4. Green innovative work behavior as a mediator

Innovative work behavior reflects the involvement of employees in generating, promoting, and executing ideas and solutions (Scott and Bruce, 1994). From an environmental management perspective, green innovative work behavior refers to behavior directed towards generating and applying novel ideas and solutions that are environmentally focused (Aboramadan, 2022). In general, employee innovative behavior is critical for hospitality and tourism firms to promote a sustainable competitive edge (Tuan, 2021a; Wang et al., 2021). This is because workers in such dynamic businesses need to innovate to fulfill clients' needs and meet their expectations (Senbeto and Hon, 2020). In light of the green demands in hospitality settings (Abualigah et al., 2023), there is a necessity to explore the factors that enhance green innovative work behavior to address these demands and meet the expectations of various stakeholders to promote sustainable development (Aboramadan et al., 2022).

In view of "resource gain spirals" in the COR theoretical framework (Hobfoll et al., 2018), we propose that green innovative work behavior may mediate the nexus between GEL and EnP. That is, workers who receive abundant resources from a source are more disposed to employ a proactive approach to acquire more resources and reinvest these resources in behaviors above the minimal requirements, ultimately resulting in superior outcomes (Halbesleben et al., 2014). GEL serves as a source of environmentally relevant resources by providing workers with adequate eco-friendly resources like autonomy and supporting them to take part in green decision-making (Badar et al., 2023). This promotes the acquisition of additional green resources (e.g., green knowledge and skills) (Meirun et al., 2024, Tuan, 2021b), which boosts confidence among employees and stimulates them to reinvest these resources and engage in additional green activities beyond their regular duties. Accordingly, this leads to the generation of innovative sustainable ideas and solutions, eventually boosting EnP. Put differently, employees can create a pool of environmentally relevant resources through leveraging confidence, trust, and participation in green decision-making gained from GEL. These resources can be further reinvested in actions that exceed the basic requirements of the job, such as green innovative work behavior in which employees develop new solutions to enhance EnP.

In empirical terms, Bhatti et al. (2022) reported that green innovative work behavior mediated the connection between GHRM and EnP. However, no empirical piece has investigated green innovative work behavior as a mediator of the effect of GEL on EnP so far.

H3. Green innovative work behavior mediates the effect of GEL on EnP.

2.5. Green intrinsic motivation and green innovative work behavior as the sequential mediators

Considering the abovementioned hypotheses (H1-H3), we postulate that GIM and green innovative work behavior may sequentially mediate the nexus between GEL and EnP. According to the COR framework, workers who receive ample resources from GEL feel appreciated and supported, which leads to greater interest and a sense of purpose in their green jobs. Such an environment is likely to foster GIM among workers because they derive inherent satisfaction and pleasure from their green work activities. This, in turn, promotes their responsibility and stimulates them to instill innovative ideas and solutions in processes and services, thereby improving firms' EnP. This is also consistent with the tenet of the "resource caravans" pathway, which reflects that "the investment and enrichment of initial resources lead to additional resource acquisition, thus generating the tendency of resources moving forward together like a caravan" (Sung et al., 2020, p. 421). In view of the SDT, GEL promotes employees' autonomy through participating in green decisions and delegating authority, enhances their competence by mentorship, skill development, and constructive feedback, and fosters relatedness through regular interactions and discussions about green-related issues with their followers. When fulfilling these essential needs, followers would presumably experience elevated levels of GIM. The higher feelings of GIM triggered by GEL may stimulate enthusiasm and curiosity among followers about green tasks and encourage them to seek new ways to resolve green-related problems which would promote EnP. Taken together, GEL drives EnP by intrinsically motivating employees to engage in eco-friendly tasks and generate non-traditional ideas and innovative solutions to address environmental issues.

H4. GIM and green innovative work behavior sequentially mediate the nexus between GEL and EnP.

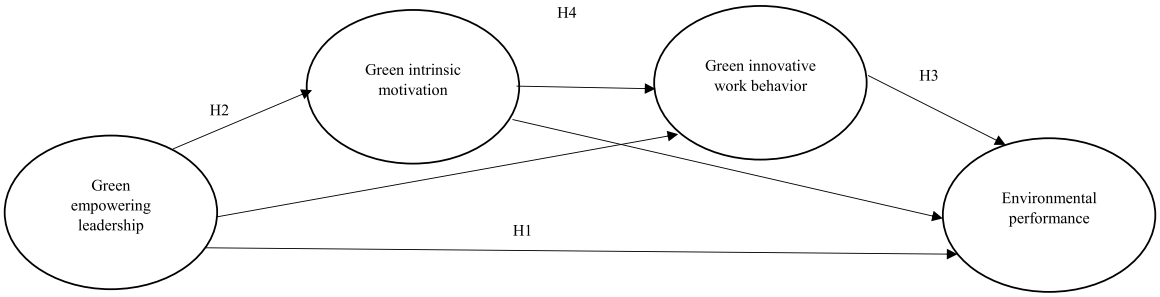
Fig. 1 depicts the hypotheses formulated above.

3. Method

3.1. Sample and data collection

Data were obtained from frontline staff in the 4- and 5-star hotels in the United Arab Emirates (UAE) utilizing an online questionnaire. This sector was selected due to its dedication to the practices of eco-friendly methods in response to strict environmental rules and consumer demands (Abualigah and Badar, 2024). Additionally, the hospitality sector has gained prominence in the economy of the UAE as a means to support the influx of foreign revenue amidst the decrease in oil prices and the global economic downturn (Elbanna et al., 2022). It is one of the fastest growing sectors in the UAE (Mordor Intelligence, 2024), and its contribution to the UAE's gross domestic product in 2023 was 11.7 % (World Travel and Tourism Council, 2024). The reason for targeting the aforementioned hotels is because of their well-established systems and procedures (Abualigah et al., 2023). In addition, 4- and 5-star hotels were selected because they have the necessary resources to adopt eco-initiatives such as renewable energy resources and water saving devices and show commitment to environmental sustainability and protect the environment (Karatepe et al., 2022).

We first approached human resource managers to get their approval to gather data, and 32 hotels agreed to contribute to this research. The method of back-translation was employed to translate the questionnaire from English into Arabic (Brislin, 1970). Prior to the main data collection, 33 employees took part in a pilot study to make sure that the items were readable and clear. No amendments were deemed necessary to improve the comprehensibility of the survey items. We used purposive sampling because it enables us to select the participants based on pertinent factors relevant to the purpose of the study (Karatepe et al., 2021). In light of this, an online survey utilizing SurveyMonkey was distributed to 500 frontline employees (e.g., front desk agents, food servers, and concierge). This survey spanned two months, specifically from January to February 2024. The reason for the selection of such employees is that they work in a high-contact environment, are considered as brand ambassadors for the firm, are among the most important staff in the delivery of quality to services to customers and are expected to promote the firm's environmental sustainability efforts



Hypotheses

H1: Green empowering leadership relates positively to environmental performance.
H2: Green intrinsic motivation mediates the effect of green empowering leadership on environmental performance.
H3: Green innovative work behavior mediates the effect of green empowering leadership on environmental performance.
H4: Green intrinsic motivation and green innovative work behavior sequentially mediate the nexus between green empowering leadership and environmental performance.

Fig. 1. Research model.

(Karatepe, 2022; Luoh and Tsaur, 2024; Xue et al., 2023).

Four hundred and thirty-seven questionnaires were received (437 / 500 = 87.4 %, response rate). The purpose of the research was explicated to the participants, and they were informed that partaking in this research through the completion of the item in the questionnaire was voluntary. Their confidentiality and anonymity were upheld. It was emphasized that "there are no right or wrong answers to the survey items". Table 1 presents the respondents' profile.

3.2. Measures

We borrowed items from different sources in the pertinent literature. A 5-point scale-"(1) strongly disagree" to "(5) strongly agree"-was utilized for the following scales. A complete list of all survey items was given in the Appendix.

3.2.1. Green empowering leadership

We utilized 13 items from Badar et al. (2023) to gauge GEL. The same items were also utilized in recent research (Ahmed et al., 2024; Meirun et al., 2024). Example items received from Badar et al. (2023) are "My supervisor encourages me to participate in taking important environment-related decisions" and "My supervisor encourages me to start environment-related tasks on my own".

3.2.2. Green intrinsic motivation

GIM was operationalized utilizing 6 items from Li et al. (2020). A sample item is "I enjoy coming up with new green ideas".

Table 1
Participants' profile.

Variables	Frequency	%
Gender		
Male	211	48.3
Female	226	51.7
Age		
18–24	115	26.3
25–34	253	57.9
35–44	67	15.3
45–60	2	0.5
Education		
High School	60	13.7
Diploma degree	181	41.4
Bachelor's degree	186	42.6
Master's degree	10	2.3
Organizational tenure		
Shorter than 1 year	66	15.1
1–5 years	237	54.2
6–10 years	122	28.0
11–15 years	11	2.5
Longer than 15 years	1	0.2

3.2.3. Green innovative work behavior

For the operationalization of this variable, we used 6 items adopted from Aboramadan (2022). Example items are "I generate green creative ideas" and "I develop adequate plans and schedules for the implementation of new green ideas".

3.2.4. Environmental performance

To gauge EnP, we tapped Kim et al.'s (2019) 7-item scale. Example items are "Environmental management within our hotel has reduced waste" and "Environmental management within our hotel has conserved energy usage".

3.2.5. Control variables

Concordant with the relevant papers (Aboramadan and Karatepe, 2021; Abualigah et al., 2023), we controlled gender, organizational tenure, and age to prevent statistical confounds.

3.3. Data analysis

Consonant with many papers in the hospitality literature (e.g., Dorta-Afonso et al., 2023; Usman et al., 2025), we utilized "partial least squares structural equation modeling" (PLS-SEM) via SmartPLS. PLS-SEM is a suitable approach for predicting the study relationships (Hair et al., 2019). This is recommended for analyzing the mediating impacts and permits the simultaneous test of multiple variables (Hair et al., 2019). PLS-SEM contains two stages: (1) the measurement model and (2) the structural model (Chin, 1998). In relation to the measurement model, we gauged the measures through item loadings, composite reliability (CR), convergent validity, and discriminant validity. We examined the "coefficient of determination (R^2)", "effect size (f^2)", "path coefficient (β)", and "predictive relevance (Q^2)" in the structural model (Hair et al., 2019). Next, a bootstrap analysis with 5000 resamples was conducted to assess the previously mentioned links.

4. Results

4.1. Measurement model

The findings from confirmatory factor analysis (Table 2) illustrated that the loadings of all scale items surpassed the 0.70 benchmark (Hair et al., 2019). Reliability was assessed utilizing CR and coefficient alpha (α). The values of both CR and α were > 0.70 (Hair et al., 2017), verifying the reliability of the measures (Table 2).

In addition, we used "average variance extracted" (AVE) to calculate

Table 2
Confirmatory factor analysis results.

Variables Items	Factor Loadings	Alpha	CR	AVE
GEL		0.937	0.938	0.569
GEL1	0.767			
GEL2	0.776			
GEL3	0.751			
GEL4	0.727			
GEL5	0.758			
GEL6	0.750			
GEL7	0.787			
GEL8	0.713			
GEL9	0.767			
GEL10	0.747			
GEL11	0.773			
GEL12	0.752			
GEL13	0.735			
GIM		0.868	0.869	0.602
GIM1	0.799			
GIM2	0.757			
GIM3	0.753			
GIM4	0.794			
GIM5	0.774			
GIM6	0.779			
GRIWB		0.840	0.843	0.555
GRIWB1	0.801			
GRIWB2	0.727			
GRIWB3	0.745			
GRIWB4	0.750			
GRIWB5	0.720			
GRIWB6	0.723			
EnP		0.864	0.865	0.550
EnP1	0.760			
EnP2	0.750			
EnP3	0.726			
EnP4	0.743			
EnP5	0.743			
EnP6	0.738			
EnP7	0.730			

Notes: AVE, average variance extracted; CR, composite reliability (rho_a); GEL, green empowering leadership; GIM, green intrinsic motivation; GRIWB, green innovative work behavior; EnP, environmental performance.

convergent validity. The AVE values > 0.50 indicate acceptable convergent validity (Fornell and Larcker, 1981). The findings in Table 2 revealed that all the AVE values were > 0.50, supporting convergent validity. Two tests were employed to assess discriminant validity: the heterotrait-monotrait (HTMT) ratio and Fornell–Larcker criterion. The $\sqrt{}$ of the AVE for a variable must be $>$ the correlation values with other variables (Fornell and Larcker, 1981). The AVE values' $\sqrt{}$s were $>$ the correlation values under the diagonal (Table 3). Our results in Table 4 denoted that all of the HTMT values were < 0.85 (Henseler et al., 2015). In short, discriminant validity was corroborated.

4.2. Common method variance

To diminish the potential effect of common method variance (CMV), procedural and statistical solutions were employed (Podsakoff et al., 2003). First, we ensured confidentiality and anonymity for respondents. Second, in the cover letter, it was clearly stated that "there are no right or wrong answers to the survey items", and participation in the research is completely voluntary (Podsakoff et al., 2003). Third, we ran Harman's single factor test through the unrotated exploratory factor analysis. The findings denoted that the primary factor was responsible for 37 % of the total variance. This was < 50 %. Fourth, a collinearity test was conducted using the "variance inflation factor" (VIF) as suggested by Kock (2015). Our results illustrated that the highest value was 1.77, which fell below the threshold of 3.3 (Kock, 2015). Finally, in congruence with recent research (e.g., Tabrizi et al., 2023), we employed a marker variable (place of birth), that was not conceptually related to the research variables. Our findings suggested that the inclusion of a marker variable did not influence the original findings (Lindell and Whitney, 2001). In short, the aforesaid steps and findings indicated that CMV was not a factor of concern.

Table 4
Heterotrait-monotrait ratio.

	1	2	3	4
1. GEL	-			
2. GIM	0.632			
3. GRIWB	0.561	0.660		
4. EnP	0.528	0.686	0.546	-

Notes: GEL, green empowering leadership; GIM, green intrinsic motivation; GRIWB, green innovative work behavior; EnP, environmental performance.

4.3. Structural model

Before examining the hypotheses, we evaluated the structural model through R^2, f^2, β, and Q^2 (Hair et al., 2019). R^2 explained the variance in the outcome variable using predictor variables. Our results indicated that R^2 was 0.329 for GIM, 0.368 for green innovative work behavior, and 0.407 for EnP, higher than the 0.10 threshold (Falk and Miller, 1992). We also assessed the predictive relevance through calculating Q^2. As a rule of thumb, a $Q^2 > 0$ indicates predictive relevance (Hair et al., 2019). We found that Q^2 values for GIM, green innovative work behavior, and EnP were 0.321, 0.241, and 0.215, respectively, indicating meaningful predictive relevance in our model. Next, we gauged the effect size (f^2) and found that f^2 values varied from 0.024 to 0.490, greater than the 0.02 threshold (Cohen, 1988) for a small effect (Table 5). Then, we evaluated the path coefficient's significance by conducting a bootstrap analysis with 5000 resamples.

The findings showed that GEL positively influenced EnP ($\beta = 0.163$, $t = 2.564$), offering support for hypothesis 1 (Table 6). GIM mediated the GEL-EnP relationship ($\beta = 0.240$, $t = 5.709$, lower-level confidence interval = LLCI, 0.164, upper-level confidence interval = ULCI, 0.329). Thus, hypothesis 2 was confirmed. Green innovative work behavior mediated the nexus between GEL and EnP ($\beta = 0.039$, $t = 2.134$, LLCI = 0.009, ULCI = 0.080), thereby corroborating hypothesis 3. Hypothesis 4

Table 3
Descriptive statistics, correlations, and discriminant validity.

Variables	Mean	SD	1	2	3	4	5	6	7
1. GEL	4.011	0.650	**(0.754)**						
2. GIM	3.994	0.590	0.573**	**(0.776)**					
3. GRIWB	4.044	0.617	0.499**	0.567**	**(0.745)**				
4. EnP	3.999	0.550	0.480**	0.598**	0.470**	**(0.741)**			
5. Age	1.90	0.652	0.044	0.059	0.054	−0.045			
6. Gender	1.52	0.500	−0.043	−0.042	−0.047	−0.062	−0.128**		
7. Tenure	2.19	0.720	0.062	0.022	0.052	−0.008	0.455**	−0.057	-

Notes: Bold values in the diagonal represent the $\sqrt{}$ of average variance extracted values; SD, standard deviations; GEL, green empowering leadership; GIM, green intrinsic motivation; GRIWB, green innovative work behavior; EnP, environmental performance. Age was measured in 4 categories, while tenure was measured in 5 categories. Gender was coded as 1 = female and 2 = male.
**$p < 0.01$.

Table 5
Results of Q^2, R^2, and f^2.

Variables	R^2	Q^2	
GIM	0.329	0.321	
GIWB	0.368	0.241	
EnP	0.407	0.215	
f^2			
Variables	**GIM**	**GIWB**	**EnP**
GEL	0.490	0.072	0.028
GIM		0.187	0.169
GIWB			0.024

Notes: GEL, green empowering leadership; GIM, green intrinsic motivation; GRIWB, green innovative work behavior; EnP, environmental performance.

Table 6
Results of hypotheses testing.

				95 % CI Bias Corrected	
Relationships	**β**	***t*- Value**	***p*- Value**	**LLCI**	**ULCI**
Direct effect					
GEL -> EnP	0.163	2.564	0.010	0.248	0.395
GEL -> GIM	0.574	12.844	0.000	0.479	0.653
GEL -> GRIWB	0.260	4.248	0.000	0.176	0.316
GIM -> EnP	0.418	6.644	0.000	0.015	0.119
GIM -> GRIWB	0.419	7.933	0.000	0.314	0.521
GRIWB -> EnP	0.150	2.558	0.011	0.369	0.588
				95 % CI Bias Corrected	
Relationships	**β**	***t*- Value**	***p*- Value**	**LLCI**	**ULCI**
Indirect effect					
GEL -> GIM -> EnP	0.240	5.709	0.000	0.164	0.329
GEL -> GRIWB -> EnP	0.039	2.134	0.017	0.009	0.080
GEL -> GIM -> GRIWB -> EnP	0.036	2.435	0.014	0.009	0.067

Notes: GEL, green empowering leadership; GIM, green intrinsic motivation; GRIWB, green innovative work behavior; EnP, environmental performance. CI = Confidence interval; LLCI = Lower level confidence interval; ULCI = Upper level confidence interval.

was corroborated because GIM and green innovative work behavior sequentially mediated the GEL-EnP relationship (β = 0.036, t = 2.435, LLCI = 0.009, ULCI = 0.067).

5. Discussion

5.1. General findings

Our research set out to add to the current knowledge on hospitality and sustainability by investigating the connection between GEL and EnP. It also set out to investigate the underlying mechanisms of the aforesaid nexus. More specifically, we examined GIM and green innovative work behavior as the serial mediators of the association between GEL and EnP. The empirical data lent credence to all the hypotheses.

In congruence with recent writings (Badar et al., 2023; Meirun et al., 2024), employees' favorable perceptions of GEL enhance critical outcomes. That is, GEL triggers hotel EnP. This finding is also consonant with the COR framework (Hobfoll, 1989), which suggests that the availability of resources that promotes eco-initiatives (GEL) is likely to encourage followers to engage in environmental activities. Put differently, GEL equips frontline staff with green knowledge and skills and stimulates them to contribute to the decision-making process. Such workers are more disposed to develop positive perceptions regarding the investment of resources and enable them to actively partake in green initiatives. This suggests that hotels can nurture EnP through GEL, which emphasizes the significance of environmental stewardship and stimulates followers to contribute to the promotion of environmental sustainability.

The findings suggest that GIM is a mediator between GEL and EnP. This is in consonance with the relevant writings (Faraz et al., 2021). GIM functions as a significant intervening variable between green leadership and green outcomes. As a source of green resources, GEL sets an example for employees and provides them with the needed resources to attain environmental objectives (Badar et al., 2023). This is likely to foster a sense of inner satisfaction among followers (Yang et al., 2022), intrinsically motivate them to acquire knowledge, and make a concerted effort to save the environment. This result receives support from the COR theory (Hobfoll, 1989), indicating that providing subordinates with many and valuable green resources may nurture their enthusiasm and interest to participate in eco-friendly activities and inherently inspire them to display green behaviors. This will bolster hotel EnP among frontline staff. This result is also consistent with the SDT. That is, leaders who display green empowerment actively promote the three universal needs "(autonomy", "competence", and "relatedness") through participation in decision-making, skill development, encouragement, and regular discussions. By doing so, they would augment followers' eagerness and intrinsic interest in eco-friendly initiatives and promote EnP.

In addition, our findings reveal that green innovative work behavior mediates the GEL –EnP linkage. An environment which has abundant green resources may encourage employees to reinvest them in eco-friendly behaviors that exceed the minimum requirements to accomplish environmental goals. This is not only in concordance with the COR framework (Hobfoll, 1989) but also receives support from recent papers (e.g., Bhatti et al., 2022). That is, GEL behaviors concentrating on offering sustainable resources allow a spiral influence on employees (Meirun et al., 2024). This is likely to urge them to challenge traditional practices and procedures in the workplace and generate innovative work techniques and implementation strategies (Badar et al., 2023). This will eventually boost hotel EnP.

Lastly, GIM and green innovative work behavior sequentially mediate the effect of GEL on EnP. This finding supports the COR framework (Hobfoll, 1989, 2001). As a role model, green empowering leaders offer workers abundant resources like autonomy and support to achieve sustainable outcomes. This, in turn, fuels their interest and sense of purpose in their green work and intrinsically motivates them to reinvest such resources towards developing and implementing new solutions to address ecological issues, thereby bolstering hotel EnP. Even though the COR theory has primarily been applied in past papers to explore how the poor performance of staff is explained by lack of resources (e.g., Wang et al., 2020), our paper adds to the limited evidence on the viability of this theory in demonstrating how workers invest additional resources to eco-friendly tasks and exhibit green behaviors when they obtain a plenty of resources from their organization (e.g., Aboramadan et al., 2021; Karatepe et al., 2024) such as GEL. Our findings are also in congruence with the SDT (Ryan and Deci, 2000) that GEL satisfies the basic human needs of "autonomy", "competence", and "relatedness" by granting autonomy to undertake eco-initiatives, offering opportunities for personal growth, and providing guidance and support to handle green-related issues, thus enhancing employees' GIM. Experiencing such autonomous energetic behavior may promote inner satisfaction among employees and encourage them to actively display ecological behaviors (e.g., green innovative work behavior) (Faraz et al., 2021), leading to enhanced EnP.

5.2. Theoretical implications

The present empirical piece adds to the current literature by examining the interconnections among GEL, GIM, green innovative work behavior, and EnP. First, there is scarcity of research pertaining to the influence of GEL on the enhancement of sustainable outcomes (Badar et al., 2023; Meirun et al., 2024). Although studies have shown that green leadership boosts EnP, these studies have largely examined top-down approaches of leadership (e.g., green transformational and servant leadership) (Li et al., 2020; Siddiquei et al., 2021). Prior writings

have demonstrated that to empower subordinates, firms need to abandon hierarchical systems (Fong and Snape, 2015; Mutonyi et al., 2020). Therefore, a lack of independence and autonomy may prevent employees from completely recognizing the significance of the objectives and motivations behind accomplishing sustainable goals. Our study advances the current literature by exploring the influence of GEL on EnP. This addresses recent calls (Elkhwesky, 2022; Haldorai et al., 2022) to gauge the factors that promote EnP by introducing the concept of GEL (Badar et al., 2023). These links have not been previously examined in the general sustainability knowledge base and in the hospitality setting to boost hotel EnP.

Second, our research addresses recent calls that have emphasized the necessity to investigate the intervening variables where green leadership enhances environmental outcomes (e.g., Hasan et al., 2024; Javed et al., 2024; Meirun et al., 2024). More specifically, we examine GIM and green innovative work behavior as the significant mediators on the linkage between GEL and EnP. Even though GIM and green innovative work behavior are considered antecedents for advancing sustainability (Bhatti et al., 2022; Li et al., 2020), additional research is needed for elucidating the role of these mechanisms (Abualigah and Badar, 2024; Elkhwesky, 2022; Tabrizi et al., 2023). Thus, our paper advances the current literature by examining GIM and green innovative work behavior as important intervening variables on the GEL-EnP nexus.

Third, our research explores the sequential mediation effects of GIM and green innovative work behavior on the linkage between GEL and EnP. Prior research on EnP has primarily concentrated on exploring the effect of a single mediator (e.g., Haldorai et al., 2022; Ojo et al., 2022). Our research goes one step further and expands the current literature by investigating GIM and green innovative work behavior as the sequential mediators linking GEL to EnP, thus ensuring a deeper understanding of the connection between GEL and EnP. Our research, to the best of our knowledge, is the first to test a sequential mediation model linking GEL to EnP via GIM and green innovative work behavior. This is also evident in Haldorai et al.'s (2025) work on hotel EnP. Consequently, our empirical piece adds to the related literature and advances the understanding of the mechanisms through which GEL affects hotel EnP.

5.3. Practical implications

From a managerial viewpoint, our study has a number of useful implications for enhancing EnP, particularly in the hotel sector. First, as evidenced in the current study, GEL is an important organizational strategy for promoting EnP. Hence, in the process of hiring for management positions in the hotel sector, applicants who demonstrate GEL behaviors should be given priority for selection. This is because green hiring is considered as an integral part of GHRM in different businesses (Abualigah et al., 2023) including the hospitality setting (Nisar et al., 2021). Second, to achieve sustainable outcomes, senior hotel management should concentrate on raising awareness of environmentalism amongst their managers. Considering this, offering green training to managers is important for enhancing their capabilities and equipping them with the needed green skills and knowledge to display GEL behaviors.

Third, managers need to instill green values among their subordinates through regular meetings to communicate the firm's environmental agendas, providing them with the resources needed and granting them authority to participate in green decision-making. In such an environment, followers are naturally inclined to help achieve the green initiatives and innovate sustainable solutions, ultimately fostering hotel EnP. Fourth, managers can increase the motivation of followers and boost responsible green behavior through concrete measures by linking ecological initiatives to the performance evaluation process. This incentivizes followers to propose useful recommendations and innovative solutions, thereby contributing to the accomplishment of the hotels' environmental goals.

5.4. Limitations and future research

Our research has some limitations that suggest areas for future studies. First, we utilized cross-sectional data, which precluded us from drawing causal inferences. Hence, we recommend that upcoming research may use a longitudinal design to provide evidence of causality. Second, we utilized self-report data which provokes concerns pertaining to possible CMV. Though our statistical and procedural remedies demonstrate that CMV is not a concern in our inquiry, future studies can use multi-source data to alleviate CMV.

Third, we used GIM and green innovative work behavior as the underlying mechanisms in the linkage between GEL and EnP. Future inquiries may explore other mediators, such as green work engagement, climate for green initiative, and job embeddedness, to further enhance the understanding of the process through which GEL enhances hotel EnP. Fourth, we used EnP as a dependent variable. Scholars are encouraged to investigate other outcomes such as proactive pro-environmental behavior and green recovery performance to fill in the void in the pertinent literature. Lastly, we recommend that future research may extend our research model to incorporate contextual/personal factors (e.g., cultural differences, organizational culture, and followers' personal beliefs) as moderating variables to explicate the nuances of GEL's impact on sustainable outcomes and broaden the generalizability of study findings.

CRediT authorship contribution statement

Osman M. Karatepe: Writing – original draft, Methodology, Conceptualization. **Ahmad Abualigah:** Writing – original draft, Software, Methodology, Formal analysis, Conceptualization. **Badreya Alzadjali:** Writing – original draft, Resources, Methodology, Data curation, Conceptualization.

Declaration of Competing Interest

None.

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Appendix

Scale items	
Green empowering leadership (Badar et al., 2023)	
1.	"My supervisor encourages me to participate in taking important environment-related decisions"
2.	"My supervisor encourages me to speak up, when I have different environment-related opinions"
3.	"My supervisor helps me develop my environment-related skills"
4.	"My supervisor helps me understand how my environment-oriented objectives and goals relate to that of the company"
5.	"My supervisor believes that I can handle demanding environment-related tasks"
6.	"My supervisor allows me to make important environment-related decisions quickly to satisfy customer needs"

(*continued on next page*)

(*continued*)

Scale items	
7.	"My supervisor gives me authority over environment-related issues within my department"
8.	"My supervisor encourages me to start environment-related tasks on my own"
9.	"My leader makes me work towards environment-related goal attainment"
10.	"My leader shows that he/she is optimistic about the environment-related future"
11.	"My leader discusses shared environment-related affairs with me"
12.	"My leader's planning of his/her environment-related work is visible to me"
13.	"My leader guides me in how I can do my environment-related work in the best way"
Green intrinsic motivation (Li et al., 2020)	
1.	"I enjoy coming up with new green ideas"
2.	"I enjoy trying to solve environmental tasks on job"
3.	"I enjoy tackling with environmental tasks that are completely new"
4.	"I enjoy improving existing green ideas at my job"
5.	"I feel excited when I have new green ideas"
6.	"I feel like becoming further engaged in the development of green ideas"
Green innovative work behavior (Aboramadan, 2022)	
1.	"I search out new environmentally related technologies, processes, techniques and/or product ideas"
2.	"I generate green creative ideas"
3.	"I promote and champion green ideas with others"
4.	"I Investigate and secure the funds needed to implement new green ideas"
5.	"I develop adequate plans and schedules for the implementation of new green ideas"
6.	"I am environmentally innovative"
Environmental performance (Kim et al., 2019)	
1.	"Environmental management within our hotel has reduced waste"
2.	"Environmental management within our hotel has conserved water usage"
3.	"Environmental management within our hotel has conserved energy usage"
4.	"Environmental management within our hotel has reduced purchases of non-renewable materials, chemicals, and components"
5.	"Environmental management within our hotel has reduced overall costs"
6.	"Environmental management within our hotel has improved its position in the marketplace"
7.	"Environmental management within our hotel has helped enhance the reputation of our hotel"

Data availability

Data will be made available on request.

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