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Shaping Sustainable Mindsets: Green Leadership's Journey Towards Fostering Environment-Specific Organizational Citizenship Behavior, Mediated By Green Intellectual Capital, And Moderated By Green Human Resources Management

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Introduction

Environment change is a pressing global issue with implications for global warming, food production, and human well-being. Statistics reveal a substantial 0.85°C temperature increase between 1980 and 2012, reducing grain yields by 40 megatons and raising sea levels by 19 centimeters (Islam et al., 2021). In 2023, it's the third warmest year, with temperatures 0.43ºC above recent averages, and a global temperature average of 1.5°C above pr[1]eindustrial levels (IPCC, 2023). Global warming claims a significant human toll, causing an annual loss of 5 million lives globally and inflicting a USD 2.4 billion economic impact (WHO, 2018). Every year, climate change kills approximately 0.2 million people and accounts for 9% of Pakistan's GDP (OCHA 2019). These statistics emphasize the urgency of addressing climate change, which is a priority in the United Nations' 2030 sustainable development goals (Goubran et al., 2023).

Recent research has increasingly emphasized the responsibility of both service and manufacturing organizations in contributing to climate change (Yong et al., 2022; Malik, et al., 2020). Scholars have recommended a shift in organizational strategies towards ecological concerns (Al-Swidi, et al., 2021; Ahmed et al., 2020; Uwem et al., 2024) and have suggested a range of steps that can aid in environmental responsibility. These tactics encompass the control of operations, monitoring activities, the development of health systems, and the implementation of ecologically sustainable initiatives (Anwar et al., 2020; Aftab et al., 2023). However, a literature gap has been recognized, prompting researchers to advocate for further theoretical and empirical advancements in this domain (Jardon et al., 2017; Islam et al., 2021; Xin et al., 2023; Naz et al., 2023). While formal strategies have been the focus of many studies related to environmental issues, some scholars argue that these approaches are often perceived

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as unethical and complex to navigate (Amin et al., 2023; Cheema et al., 2020; Peng et al., 2024). An alternative perspective posits that addressing environmental concerns should involve fostering employees' citizenship behaviors towards the environment (Malik et al., 2021; Khan et al., 2021; Mostafa & Saleh, 2023). However, it's worth noting that research on employees' environment-specific citizenship behavior in this context is still relatively nascent (Wengang et al., 2023).

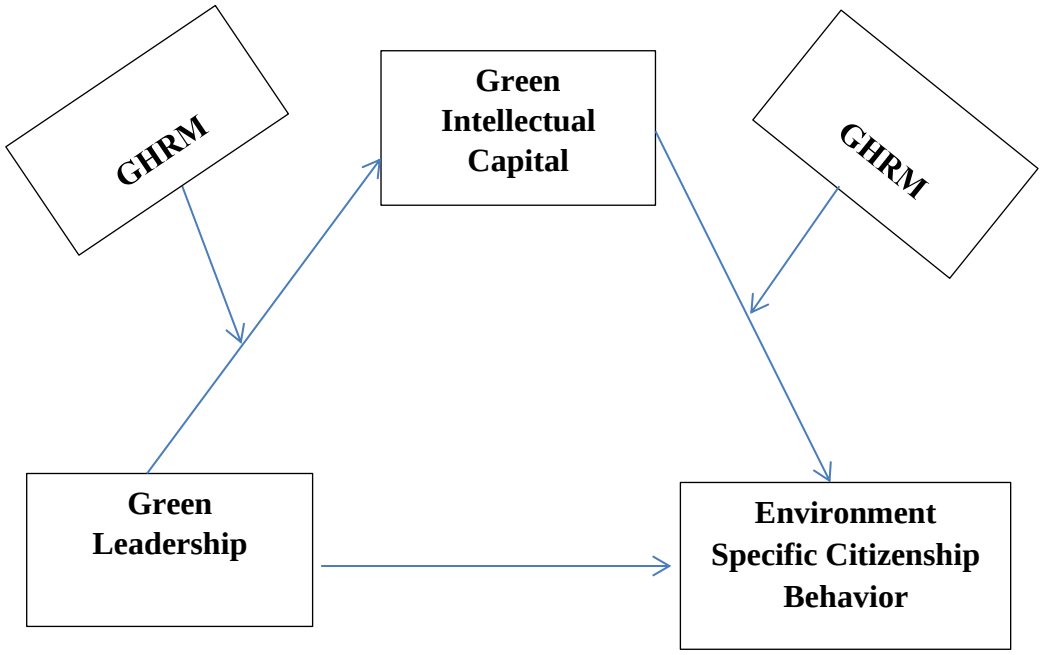
Consequently, an increasing body of scholarly literature underscores the need to investigate an array of factors across distinct organizational levels, to nurture employees' stewardship towards the environment (Priyadarshini et al., 2023; Liu & Yu, 2023; Islam et al., 2021). Previous research has identified organizational-level factors such as green human resources management and corporate sustainability (Úbeda-García et al., 2021; Xiao et al., 2020; Unsworth et al., 2021). Supervisor-level factors include responsible leadership (He, Morrison, & Zhang, 2021), environmental leadership (Su et al., 2020; Zhang & Ma, 2021), transformational leadership (Peng et al., 2021; Çop et al., 2021), servant leadership (Ying et al., 2020; Faraz et al., 2021), ethical leadership (Islam et al., 2021), and green leadership (Singh et al., 2020; Chen et al., 2023; Sachdeva & Singh, 2024). Additionally, individual-level factors, including perceived green empowerment (Hutomo et al., 2020), sense of environmental responsibility (Paillé & Valéau, 2021), environmental knowledge (Bala et al., 2023), green values (Chaihanchanchai & Anantachart, 2023; Islam et al., 2021), green psychological capital (Chen et al., 2023), and green intellectual capital (Asiaei et al., 2023), have been recognized as influencers of eco-friendly behavior.

Moreover, scholars have raised concerns in the scientific literature regarding the clarity of factors influencing pro-environmental behavior (Nisar et al., 2024). They note that research investigations have primarily concentrated on individual-level factors, supervisor-level factors, or organizational-level factors in isolation, without considering the significance of combined factors (Yusliza et al., 2020; Yuriev et al., 2020). Moreover, there is a limited understanding of the mediating pathways and contextual constraints in the connection between green leadership and environmentally responsible behavior (Islam et al., 2021). In response to these challenges, our study presents a novel model that integrates supervisor-level factors (green leadership), organizational-level factors (GHRM, and GIC), and individual-level factors (employee citizenship behavior for the environment) in the context of environmental sustainability. This approach aims to offer a deep insight into the multifaceted factors that impact pro-environmental behavior, addressing the limitations identified in prior research.

Building on the foundation of Bandura's (1977) social learning theory (SLT), which contends that followers acquire knowledge by observing the behaviors of their leaders in the organization, this study offers that green leadership (GL), characterized by a strong commitment to environmental sustainability and the active promotion of environmentally friendly practices within organizations positively increases employees' OCBE (individual pro-environmental behavior). OCBE, as defined by Robertson and Barling (2017), pertains to individual discretionary behaviors that immediately benefit the natural environment and, in turn, contribute to the organization and specific individuals. However, the acknowledgement of leadership's influence on shaping human behavior toward more environmentally friendly practices in the workplace underscores the need for empirical investigation (Robertson and Barling, 2013; Uwem et al., 2024). Hence, we introduce green human resource management

(GHRM) as an organizational framework for promoting eco-friendly behavior and fostering environmentally conscious workplaces. GHRM moderates the association between green leadership and both green intellectual capital (GIC) and organizational citizenship behavior for the environment (OCBE), enhancing our understanding of this dynamic relationship.

Scholars have acknowledged the need for enriched comprehension of the boundary conditions between green intellectual capital (GIC) and employees' eco-citizenship behavior (OCBE). GIC encompasses environmental knowledge, awareness, innovative capabilities, and sustainable practices (Chen, 2008). GHRM practices have been suggested as a moderating mechanism in this context, strengthening the direct association between green leadership and OCBE and indirectly via GIC. We can also understand this concept by applying Appelbaum's (2000) ability-motivation-opportunity (AMO) theory, which highlights the synergy of employees' abilities, motivation, and opportunities driving pro-environmental behavior, our study introduces GHRM as a conditional moderator between green leadership and both GIC and OCBE, therefore, this study enhances the existing knowledge by conducting a comprehensive examination of these relationships and deepening our understanding. (see Figure 1).



THEORY AND HYPOTHESES DEVELOPMENT

Ability-Motivation-Opportunity (AMO)

This study employs the ability-motivation-opportunity (AMO) theory to delve into the intricate dynamics between green leadership, environment-specific citizenship behavior, green intellectual capital, and green HRM. Initially introduced by Appelbaum et al. (2000), the AMO theory has extensive application in various areas, notably leadership, HRM performance, and extra-role performance research.

According to this theory, green leadership significantly impacts employees' abilities, motivations, and opportunities to engage in environmentally responsible actions (Jia et al., 2018). The influence is further strengthened by GHRM practices encompassing recruitment, training, rewards, and empowerment (Singh et al., 2020). However, our study takes the AMO theory beyond traditional employee attitudes and behaviors associated with leadership and HRM practices. We explore how green leadership's ability, motivation, and opportunity dimensions influence the relationship with environment-specific green citizenship behavior, emphasizing the role of GHRM in selecting, motivating, training, developing and retaining environmentally committed employees. This approach enhances environmental-related extra-role performance and leverages the organization's green intellectual capital to advance sustainability initiatives.

Within the AMO theory framework, green intellectual capital assumes a pivotal role, encompassing the collective environmental knowledge, skills, and capabilities of employees (Yong & Ahmad, 2020; Bazkiaei et al., 2022). As per the AMO theory perspective, when green leadership cultivates a sustainability culture, it systematically stimulates the acquisition and utilization of green intellectual capital within the organization. This, in turn, not only empowers employees with the requisite knowledge and skills to engage in environmental OCB but also aligns with the principles of the AMO theory, emphasizing the dynamic interplay between leaders' abilities, motivations, and opportunities in driving pro-environmental behavior. This mediating pathway posits that green leadership not only directly influences OCBE but also indirectly, through the cultivation and application of green intellectual capital, thus reinforcing the core tenets of the AMO theory. This nuanced perspective underscores the integration of leadership, HRM practices, and intellectual capital within the AMO framework, contributing significantly to the promotion of sustainable behaviors in the workplace.

Social learning theory (SLT)

The social learning theory (SLT) encompasses two fundamental learning processes: reinforcement learning and observational learning, elucidated by Bandura and Walters (1963). Observational learning involves employees interacting to acquire new behaviors, with further classification into rational observational learning, influenced by social referents' opinions, and irrational observational learning, driven by social referents' behaviors (Ahmad et al., 2021). As elucidated by Bai et al. (2019), individuals exposed to behaviors being enacted are immersed in a social context that involves exposure to role models, imitation of behaviors, and social reinforcement for either adopting or avoiding specific conduct. Notably, irrational observational learning tends to exert a more substantial influence on observers compared to rational learning processes, as the former is primarily shaped by behavioral cues rather than advice and opinions (Cheng et al., 2019).

Conversely, individuals typically prefer observing and seeking guidance from social referents when learning new behaviors, with reinforcement learning constituting the second type. Reinforcement learning pertains to the frequency, probability, and magnitude of rewards or punishments related to specific behaviors (Brady et al., 2021). According to Lowry et al. (2016), the elimination of punishments (negative reinforcement learning) and the provision of rewards (positive reinforcement learning) would reinforce particular behaviors in the workplace. Consequently, individuals consistently adjust their behaviors, either to avert penalties or secure rewards.

While both learning processes are integral, they originate from distinct sources. Observational learning draws from indirect learning experiences, such as observing others or seeking guidance, while reinforcement learning is rooted in direct learning experiences, particularly employees' previous behaviors. The latter primarily concentrates on the outcomes of behaviors, enabling individuals to avoid penalties or gain rewards (Akers & Jennings, 2015). In contrast, observational learning focuses on acquiring the knowledge of how to engage in specific behaviors, assisting individuals in avoiding impreciseness related to that behavior. Existing literature underscores the significance of observational learning, especially in the early stages of the workplace, as it helps individuals adopt accurate behaviors when their knowledge is limited (Rumjaun & Narod, 2020). Consequently, we posit that when employees observe their leaders demonstrating pro-environmental behaviors, they may develop a corresponding sense of responsibility towards society and the environment, thereby engaging in similar discretionary behaviors (Bandura, 1977).

Green Leadership and OCBE

Green leadership also known as environmental or sustainable leadership, is a leadership style dedicated to addressing environmental and sustainability concerns (Chen et al., 2014; Al-Swidi et al., 2021; Nawaz Khan, 2023). Such leadership involves the ability to advocate for pro-environmental practices and influence the organization to support green practices (Kapoor et al., 2023). Green leaders guide their followers in ways that promote ecological responsibility, reduce environmental impact, and contribute to a more sustainable future (Mittal & Dhar, 2015; Sachdeva & Singh, 2024). These leaders are committed to principles such as conservation, social responsibility, and the long-term health of the organization. Green leadership has consistently shown positive relationships with a range of critical outcomes, including environmental performance (Ashraf et al., 2023; Asante, 2023), green creativity and green innovation (Chen et al., 2013; Begum et al., 2022; Singh et al., 2020;). Such leadership is also linked to encouraging followers' green behavior (Wang et al., 2018), promoting green engagement (Huang et al., 2021; Gustiah et al., 2022), and facilitating green knowledge-sharing behavior (Chen et al., 2023). The present study explores how green leadership influences environment-specific organizational citizenship behavior (OCBE).

According to Robertson and Barling (2023), OCBE is employee behavior that positively serves the organization but is not yet accredited. While the literature on OCBE is limited, it consistently demonstrates a positive association with environmental performance (Lu et al., 223; Khan et al., 2021; Yuan et al., 2024). Consequently, OCBE can be a valuable tool in addressing environmental challenges such as climate change and global warming. To promote OCBE, researchers have proposed various leadership styles that encourage pro-environmental behavior among employees (Boiral et al., 2015; Zhao & Zhou, 2019 Iqbal et al., 2023). Likewise, green leaders who prioritize and exemplify pro-environmental behaviors set a compelling example for their employees. When employees perceive their leaders as environmentally responsible, they are more likely to engage in OCBE directed towards the environment, such as resource conservation, waste reduction, or participation in green initiatives within the organization (Islam et al., 2021). This environmentally responsible leadership fosters a culture of environmental stewardship within the organization, ultimately leading to increased environmental OCB (Abbas et al., 2023).

Moreover, green leadership can also impact employee green motivation and commitment in a way when employees feel that their leaders genuinely care about environmental sustainability, they are more likely to commit to the organization's environmental goals (Iqbal et al., 2023; Hameed et al., 2022; Awan et al., 2023). Such dedication can lead to increased environmental OCB, as employees voluntarily engage in activities that support the organization's environmental objectives (Priyadarshini et al., 2023). In this way, green leadership can create a positive cascading effect on environment-specific OCB, benefiting both the organization and the environment. These dynamics can be understood through the ability-motivation-opportunity theory of Appelbaum et al. (2000), which explains how leaders' abilities and motivations in promoting sustainability provide employees with the opportunity and encouragement to engage in environmentally responsible behaviors. Additionally, social learning theory underscores the role of observational learning and social influence in shaping employees' pro-environmental behavior emphasizing the impact of green leadership on employee extra-role environmental behavior (Bandura, 1977). We therefore argue that green leadership will have a positive effect on OCBE.

H1: Green leadership positively influences subordinates' OCBE.

Green Leadership and intellectual capital

Green leadership has a significant effect on the development and accumulation of intellectual capital within an organization. These leaders, who champion sustainability initiatives and embody environmental responsibility, play a pivotal role in nurturing knowledge, skills, and expertise related to environmental sustainability (Farrukh et al., 2022; Umar et al., 2024). Importantly, green leadership encourages knowledge sharing and learning in the context of sustainability, fostering a culture of continuous learning, innovation, and adaptation to environmental challenges (Chen et al., 2023). This approach not only enriches the organization's collective knowledge base but also promotes the growth of intellectual capital.

Viewed through the lens of the ability-motivation-opportunity (AMO) theory by Appelbaum et al. (2000), green leadership enhances employees' abilities in sustainability. Leaders who model eco-conscious behaviors and support sustainability initiatives equip their teams with the abilities needed to excel in sustainable practices (Riva et al., 2021). This is achieved through training, awareness programs, and a consistent focus on developing sustainability-related skills (Boiral, Raineri & Talbot, 2018; Hina et al., 2024). Additionally, green leadership fosters motivation among employees by creating a compelling vision and fostering intrinsic motivation to align personal values with the organization's environmental objectives (Ashraf et al., 2023; Singh et al., 2020; Jia et al., 2018). Finally, green leaders create opportunities for employees to apply their knowledge and motivation to sustainability initiatives, effectively leveraging their intellectual capital to drive environmental sustainability efforts. This integration of ability, motivation, and opportunity, as delineated by the AMO theory by Appelbaum et al. (2000), explains an important role in enhancing an organization's green intellectual capital and, consequently, overall environmental-related extra-role performance.

Moreover, the social learning theory of Bandura (1977), describes the role of observational learning and social influence in shaping employees' behavior. Green leadership aligns with SLT by providing employees with role models and socially enabled opportunities to learn and engage in pro-environmental actions (Althnayan et

al., 2022). Through green leadership, employees not only acquire knowledge and skills but also internalize environmental responsibility through observing and interacting with leaders who prioritize sustainability, thus reinforcing the organization's commitment to environmental stewardship. Hence, we postulate:

H2: Green leadership positively influences green intellectual capital (GIC)

Mediating Role of Green Intellectual Capital

Green intellectual capital (GIC) has become increasingly significant in the management literature, representing the integration of environmental concepts into the realm of intellectual capital (Chang & Chen, 2012). Chen (2008) defined GIC as the collective intangible resources, knowledge, skills, and relations related to environmental preservation and sustainable development at all levels i.e., leadership, organization and individual levels. This evolving concept is essential for organizations due to its capacity to ensure compliance with strict international environmental regulations, cater to the growing environmental consciousness among consumers, and create value for the organization (Yusliza et al., 2020; Marco-Lajara et al., 2023).

Within the classification of GIC, three key dimensions emerge (Yusoff et al., 2019). Firstly, green human capital embodies the individuals' capability, proficiency, mindsets, and dedication to sustainability and innovative environmental practices. Secondly, green structural capital encompasses various organizational competencies and resources related to green inspiration and environmental management (Xi et al., 2023; Hina et al., 2024). Lastly, green relational capital pertains to the collaborating dealings with stakeholders related to environmental protection and green novelty, enabling organizations to gain a competitive advantage (Chen, 2008; Umar et al., 2024). These dimensions play a pivotal role in facilitating green organizational citizenship behavior (OCB) within the organization (Wang & Juo, 2021).

Drawing from the AMO theory Appelbaum et al. (2000), and social learning theory (Bandura, 1977) this study posit that green intellectual capital, comprising, green structural capital, green human capital and green relational capital, mediates the relationship between green leadership and environment-specific citizenship behavior. Green leadership fosters environmental responsibility and a sustainability-oriented culture, enhancing employees' abilities and motivation, thereby providing the "ability" and "motivation" for environmentally responsible behaviors (Ashraf et al., 2023; Awan et al., 2023). Intellectual capital acts as the critical "opportunity" element within the AMO framework, bridging the influence of green leadership to translate the potential for green citizenship into concrete environmentally responsible actions (Hameed et al., 2022). Additionally, SLT describes the role of observational learning and social influence in shaping individuals' environmentally responsible behaviors, further reinforcing the importance of intellectual capital in facilitating environment-specific green citizenship behavior (Bandura, 1977). Therefore, we postulate:

H3: Green intellectual capital positively influences subordinates' OCBE.
H4: Green intellectual capital mediates the relationship between green leadership and subordinates' OCBE.

Moderating Role of GHRM Practices

Green human resource management (GHRM) practices have emerged as a crucial requirement in today's business environment due to interconnected factors (Pham et

al., 2020; Tu, Li, & Zuo, 2023). First, the rise in environmentally detrimental incidents and concerns necessitates organizations to adopt eco-conscious practices to address adverse environmental impacts (Adubor et al., 2022). Second, the extensive use of natural resources in industrial processes often leads to waste generation and environmental pollution (Chaudhary, 2020). Third, global concerns like pollution, ecological imbalances, and climate change are consequences of excessive natural resource consumption for raw material production (Roscoe et al., 2019).

The prominence of the green agenda is particularly pronounced in emerging economies like Pakistan, where a significant surge in energy and resource consumption has substantially contributed to environmental degradation. For instance, Pakistan experienced an average annual CO^2 emissions growth rate exceeding 9% in 2022, closely following China and the United States (Khan et al., 2020). Scholars suggest that green HRM should be viewed within the spectrum of HRM practices, encompassing, recruitment, training, job analysis, performance appraisal, and rewards (Al-Minhas et al., 2020; Ziyadeh et al., 2023; Nisar etbal., 2024). This transformation involves recruiting employees based on green criteria, providing sustainability management training, and implementing performance assessments that gauge sustainability performance, thus rewarding employees for achieving green objectives (Saeed et al., 2019; Choudhary & Datta, 2024).

The successful implementation of GHRM practices depends on the alignment of HRM activities with environmental management, reflecting a strategic shift towards corporate environmental responsibility (Emel & Caliskan, 2019; Tabrizi et al., 2023). Within this context, previous studies have explored GHRM as a valuable mechanism for encouraging pro-environmental behaviors among employees in the organization. Scholars have advocated that GHRM practices should orient staffing rules to improve employees' environmental consciousness, attitudes, and behaviors (Rubel et al., 2021; Farrukh et al., 2022; Nisar et al., 2021).). As organizations worldwide grapple with environmental challenges, the adoption of GHRM practices emerges as a pivotal strategy in promoting environmentally responsible behaviors among employees and fostering sustainable business operations (Iftikar et al., 2019; Ansari et al., 2021; Chaudhary,2020).

Building upon the AMO theory (Appelbaum et al., 2000) and integrating insights from social learning theory (Bandura, 1977), green human resource management practices assume a dual moderating role in shaping the connection between green leadership and environment-specific green citizenship behavior. Firstly, GHRM practices act as direct moderators, enhancing the direct connection between green leadership and OCBE by optimizing the "Opportunity" element. These practices create a nurturing environment that empowers employees to effectively channel their abilities and motivations (Veerasamy et al., 2023), therefore reinforcing the positive effect of green leadership on OCBE.

Secondly, GHRM practices also perform an essential role in moderating the indirect association between green leadership and environment-specific green citizenship behavior. This moderation occurs through the mediation of green intellectual capital. GHRM practices contribute to the enhancement of green intellectual capital, further strengthening the positive impact of green leadership on OCBE. In this way, GHRM practices strengthen the direct impact of green leadership on environment-specific green citizenship behavior while enhancing their influence through the cultivation of green intellectual capital. This combined approach fosters a more environmentally

responsible organizational culture. Additionally, this concept could be better understood through the lens of social learning theory (Bandura, 1977), which underscores that employees acquire and embrace environmentally responsible behaviors by observing their leaders. This aspect highlights the critical role of exemplary green leadership within this framework, as leaders' actions and behaviors serve as powerful models for employees, encouraging them to adopt sustainable practices and contribute to a more environmentally conscious organizational culture (Rubel et al., 2021). Therefore, we postulate the following hypotheses:

H5: GHRM practices moderate the relationship between green leadership and environment-specific citizenship behavior

H6: GHRM practices moderate the relationship between green leadership and environment-specific citizenship behavior via green intellectual capital

METHODS

Participants and procedure

This study gathered data from business scholars in Pakistan for several factors. Initially, our study focuses on examining green leadership, a construct that could be more accurately foretold by employees with extended working experience with their supervisors. Given the guidelines of the HEC of Pakistan, candidates are required to have at least two years of employment to enroll in the MBA executive program. This ensured that our respondents had substantial experience with the same supervisors. Second, it's worth noting that although English is Pakistan's official language (Raja et al., 2004), some respondents may not fully understand and respond to English-language questionnaires. To mitigate this language barrier, this study selected experienced educated participants i.e., MBA executive students (Islam et al., 2020b). finally, obtaining permission for data collection directly from management can be challenging, as it might impede their potential to achieve organizational objectives (Islam et al., 2018). Additionally, employees may not feel comfortable discussing their workplace or supervisors while at their workplace (Islam et al., 2021).

We employed a convenience-based survey method, distributing 740 questionnaires. At Time1, we received 590 responses and redistributed the questionnaire to the same respondents, ultimately obtaining 486 responses at Time 2. We removed 9 responses with missing values and 11 responses with extreme values. Of these, 466 were utilized for study analysis, resulting in an effective response rate of 63%. To address common method bias, as data was gathered from the same individuals, we implemented measures such as question shuffling and the inclusion of dummy questions to assess respondent sincerity (Islam & et al., 2018). Demographic information, green leadership, and GIC data were collected at Time1, while data on GHRM practices and OCBE were collected at Time2, with a 30-day interval (Islam et al., 2021). We used Harman's single-factor test to examine common method bias, and the findings revealed that only 34.58% of the variation is described by a single factor, which is less than the 50% criterion (Harman, 1967).

Measures

The present study utilized established scales to measure respondents' answers, which were assessed on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Green leadership

Green leadership was assessed employing a six-item scale established by Chen & Chang (2013), exhibiting high internal consistency with a Cronbach's alpha coefficient of 0.86. The items in this scale demonstrated strong factor loading values, ranging from 0.61 to 0.85, further supporting its reliability and validity.

GHRM

This study employed a six-item scale of GHRM developed by Dumont et al. (2017), which had previously been validated by Hameed et al. (2020) and Ahmad and Umrani (2019) in an Asian context. Including items such as, "My company considers employees' workplace green behavior for promotions." Notably, the factor loadings for these items ranged from 0.68 to 0.76, and the scale exhibited a Cronbach Alpha reliability value of 0.87.

OCBE

We employed a 10-item scale measured by Boiral and Paillé (2012) to measure OCBE, a scale validated by Luu (2019a). The scale demonstrated strong reliability, with factor loading values ranging from 0.72 to 0.83 and a Cronbach Alpha coefficient of 0.93. Sample items from this scale consist of statements like, "I voluntarily undertake environmental actions and initiatives in my daily activities."

Green Intellectual Capital

Green intellectual capital was assessed employing a five-point Likert-type scale comprising seven items, adapted from measures utilized in previous studies conducted by Chang and Chen (2012) and Chen (2008). Especially, the factor loadings for these items ranged from 0.66 to 0.74, and the scale displayed a Cronbach Alpha reliability value of 0.88.

Control Variables

Demographic variables were incorporated into the study as control variables, recognizing their documented influence on various aspects such as green intellectual capital (GIC), green human resource management (GHRM), and green leadership (GL) (Davis et al., 2019; Islam et al., 2021).

RESULTS

Preliminary analyses

In our preliminary analyses, we identified 9 responses with missing values, which were subsequently removed, following the guidelines from Hair et al. (2010). Additionally, we eliminated 11 responses due to extreme values, as determined by the Mahalanobis Distance test at $p < 0.000$, as suggested by Kline (2016). Subsequently, the final dataset for analysis consisted of 466 responses.

We assessed data normality following the approach outlined by Byrne (2010). The values of skewness and kurtosis were observed to meet the standard criteria, with skewness falling within the range of ±1 and kurtosis within the range of ±3. Furthermore, we examined the correlations among all the variables, and the values were observed to be well below 0.85 (see Table 2). As a result, we did not detect any issues of multicollinearity, following the guidance of Tabachnick and Fidell (2007).

Reliability and validity of measures

This study employed the AMOS software and utilized maximum likelihood estimation. This choice was made based on the absence of multicollinearity issues and the normal distribution of the data, as confirmed by Islam et al. (2021). As highlighted by Hair et al. (2010), AMOS is a robust analytical tool, especially suited for assessing model fit. Our analysis consisted of a confirmatory factor analysis for two primary reasons. First, the scale used in this study was adapted from previous research, as described by Hair et al. (2010). Second, this study aimed to ascertain the alignment of these measurement items with our operational definitions of the constructs, following the guidance provided by Byrne (2010).

In evaluating the model fit, we employed a range of fit indices, including the chi-square/degrees of freedom ratio ($\chi 2$/df), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean residual (SRMR), aligning with the guidelines recommended such as Brown (2015), Hooper et al. (2008), and McDonald & Ho (2002). Furthermore, we adhered to the criterion of factor loadings exceeding 0.50 (see Table 1), as proposed by Hair et al. (2010).

Table 1: Confirmatory Factor Analysis

Model	**x^2**	**df**	**x^2/df**	**CFI**	**SRMR**	**RMSEA**
Standard values			≤3.0	≥0.90	≤0.08	≤0.08
Model 4: Four-factor model	1072	366	2.93	.91	.075	.064
Model 3: GL, GIC and GHRM combined	695	149	4.66	.87	.097	.089
Model 2: GL-GIC and GHRM -OCBE	3152	376	8.35	.64	.232	.126
Model 1: All variables combined	3929	377	10.42	.54	.20	.14

This study evaluated the scale's reliability by using Cronbach's alpha, adhering to the accepted criterion of 0.70, as outlined by Cronbach (1951). All scales exhibited satisfactory reliability, as detailed in (Appendix A1). Furthermore, we assessed convergent validity by examining composite reliability (CR) using a criterion of 0.60 and average variance extracted (AVE) with a criterion of 0.50. This approach aligns with the recommendations of Bagozzi and Yi (1988) and Raza et al. (2020). The results confirmed that the scales demonstrated convergent validity.

To assess discriminant validity, we compared the maximum shared variance (MSV) with the AVE. In line with the guidelines proposed by Fornell and Larcker (1981), our findings indicated that the AVE was greater than the MSV. Consequently, there were no concerns regarding the reliability or validity of the measures.

Descriptive statistics

The descriptive statistics results, as presented in Table 2, reveal the following mean values for the studied constructs: green leadership (M = 3.32), GIC (M = 3.30), GHRM practices (M = 3.22), and OCBE (M = 3.48). Importantly, the standard deviations for

all these factors were less than 1, indicating minimal variability within the sample for each construct (refer to Table 2).

Table 2: Descriptive Statistics, and Normality

Variables	Mean	SD	Skewness	Kurtosis
GL	3.32	0.98	-0.48	-1.037
GIC	3.30	0.93	-0.47	-1.085
GHRM	3.22	0.85	-0.35	-.975
OCBE	3.48	0.83	-0.97	-.462

Correlational analyses

The correlational analyses show significant positive associations that are consistent with the overarching theme of our study, which focuses on the influence of green leadership on environment-specific citizenship behavior, taking into account the mediating impact of green intellectual capital and the moderating impact of GHRM. Specifically, green leadership exhibited positive correlations with green Intellectual Capital ($r = 0.224$, $p < 0.01$), green human resource management ($r = 0.577$, $p < 0.01$), and OCBE ($r = 0.513$, $p < 0.01$). Additionally, GIC demonstrated a positive correlation with OCBE ($r = 0.311$, $p < 0.01$). These results support the initial hypotheses of our study.

Table 3: Correlation and Reliability

Variables	1	2	3	4
1-GL	(.86)			
2-GIC	.224**	(.88)		
3-GHRM	.577**	.460**	(.87)	
4-OCBE	.513**	.311**	.527**	(.93)
Green Leadership= GL, Green Intellectual Capital= GIC, Green Human Resources Capital= GHRC, environment-specific citizenship behavior = OCBE, N=466. **p < 0.01; *p < 0.05.				

Hypothesis testing

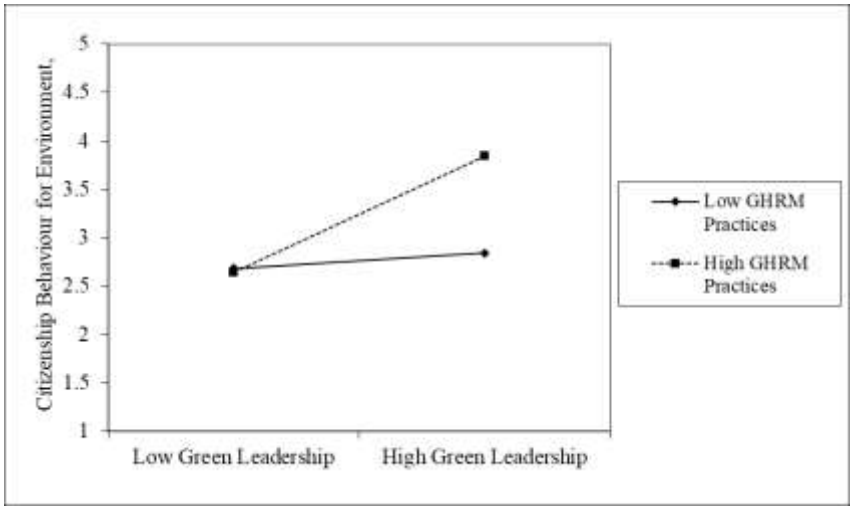
To evaluate our hypotheses, we conducted a regression analysis with 5000 bootstrapping iterations at a 95% confidence level, following the approach outlined by Cheung and Lau (2008). Our analysis revealed several significant findings that support the initial hypotheses of our study. Firstly, we found that green leadership had a positive influence on OCBE ($\beta = 0.24$, $p = .000$, $t = 12.87$, 95% CI [0.359, 0.517]), as well as a positive effect on GIC ($\beta = 0.21$, $p = .000$, $t = 4.96$, 95% CI [0.122, 0.305]). Additionally, GIC was found to positively predict OCBE ($\beta = 0.28$, $p = .000$, $t = 7.04$, 95% CI [0.196, 0.362]). These results demonstrate the significance of the first three hypotheses of our study (H1, H2, and H3, respectively).

The mediating influence of green intellectual capital was assessed using the Hayes process (2012). Our findings indicate that green leadership positively influences green intellectual capital (β = 0.21, p = 0.000, 95% CI [0.1286, 0.2973]), green leadership also positively impacts OCBE (β = 0.24, p = 0.000, 95% CI [0.3316, 0.4649]), and GIC has a positive impact on OCBE (β = 0.28, p = 0.000, 95% CI [0.1152, 0.2559]). Furthermore, green leadership's impact on subordinates' OCBE through GIC was significant (β = 0.52, p = 0.000, 95% CI [0.3711, 0.5047]). The studies' indirect effect (β = 0.29, p = 0.000, 95% CI [0.195, 0.645]) was larger than the direct effect between green leadership and OCBE (β = 0.24), with no overlap between the upper and lower limits, as confirmed by Hayes and Rockwood (2020). Therefore, green intellectual capital was noted to amplify the impact of green leadership on OCBE, thereby Hypothesis 4 is also supported (see Table 4).

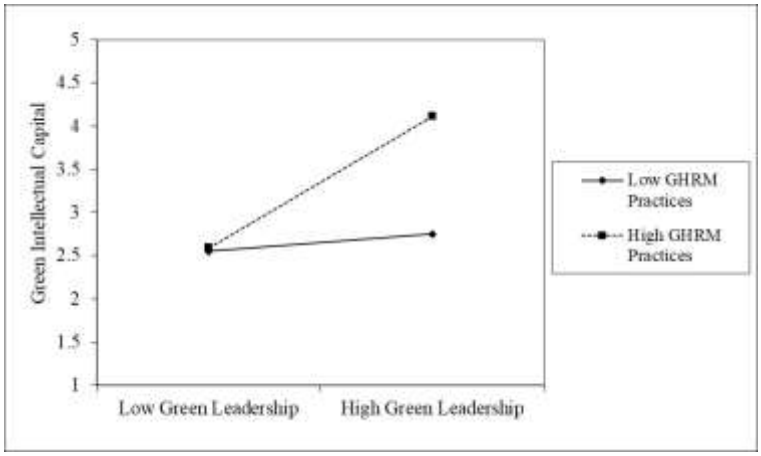
Table 4: Regression and Mediation Analysis

Hypotheses	**β**	**t**	**p**	**Bootstraps at 95%** **LL** **UL**
GL → OCBE	.24	12.87	.000	.359 .517
GL → GIC	.21	4.96	.000	.122 .305
GIC → OCBE	.28	7.04	.000	.196 .362
EL → GHRM → OCBE Indirect effect .29			.000	.195 .645
Green Leadership= GL, Green Intellectual Capital= GIC, Green Human Resources Capital= GHRC, environment-specific citizenship behavior = OCBE. N=466				

The moderating role of GHRM practices on the link between green leadership and OCBE was assessed using the Hayes process (2012). The study analysis revealed a significant impact of GHRM practices on OCBE (β = 0.24, p = 0.000, 95% CI [0.596, 0.137]). Similarly, we found that the interactional term (GL * GHRM) had a significant impact (β = 0.26, p = 0.000, R^2-chng = .024, 95% CI [0.234, 0.085]), indicating a moderating role. To further elucidate this interaction, we examined the slope, which indicated that high GHRM practices are likely to enhance OCBE in the existence of green leadership, thus supporting Hypothesis 5 (See Figure 2).



Additionally, we explored the moderated mediation of GHRM practices in the connection between green leadership and GIC. This study results show that GHRM practices had a significant impact on GIC ($\beta = 0.35$, $p = 0.642$, 95% CI [0.266, 0.324]). Furthermore, the interactional term (GL*GHRM) exhibited a significant impact ($\beta = 0.33$, $p = 0.000$, R^2-chng = .013, 95% CI [0.221, 0.383]), indicating a moderating role. To gain a deeper understanding of this interaction, we examined the slope, which revealed that high GHRM practices are expected to foster GIC in the manifestation of green leadership, thereby supporting our study's hypotheses (H5, See Figure 3).



Finally, this study explores the moderated mediation of GHRM practices in the association between GIC and OCBE. The study analysis revealed a significant influence of GHRM practices on OCBE ($\beta = 0.37$, $p = 0.000$, 95% CI [0.472, 0.046]). Similarly, the interactional term (GIC*GHRM) demonstrated a significant impact ($\beta = 0.29$, $p = 0.000$, R^2-chng = .01, 95% CI [0.177, 0.031]), indicating moderation. This study also examined the slope of interaction, which indicated that high GHRM practices are likely to promote OCBE in the existence of green intellectual capital, in alignment with our study's hypotheses (H5, see Figure 4).

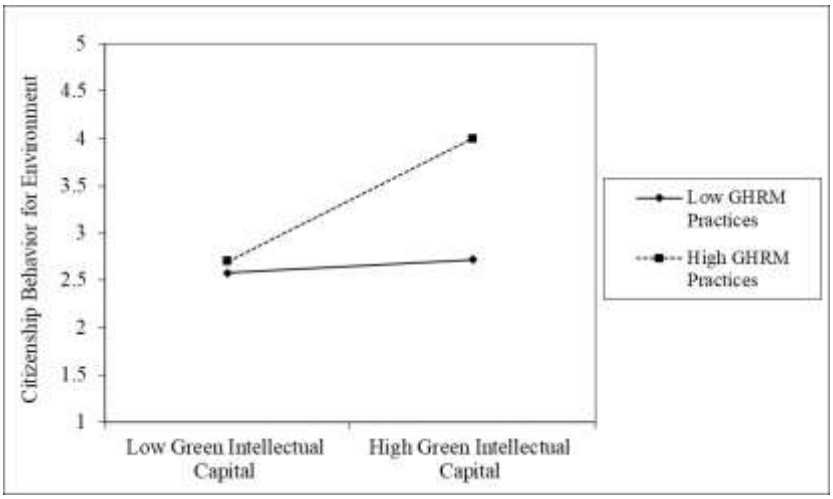


Table 4: Moderation Analysis and Moderated Mediation

Hypotheses	**β**	**R^2-chng**	**p**	**Bootstraps at 95% LL UL**
Moderating role of GHRM GL*GHRM → OCBE	.26	.024	.000	.234 .085
Moderating role of GHRM GL*GHRM → GIC	.33	.013	.000	.221 .383
Moderating role of GHRM GIC*GHRM→ OCBE	.29	.010	.000	.177 .031
Green Leadership= GL, Green Intellectual Capital= GIC, Green Human Resources Capital= GHRC, environment-specific citizenship behavior = OCBE. N=466				

DISCUSSION

In recent years, the urgency of addressing climate change has prompted a significant transformation in the business community's values and priorities (Ahmed, Zehou et al., 2020). A CEO meeting of 200 topmost companies emphasized that revenue and shareholder prosperity enhancement are no longer the sole objectives of businesses (Sandler, 2019). Instead, they have recognized the imperative to prioritize the well-being of personnel, suppliers, society, customers, and the environment (Shah et al., 2019). This concept aligns with the growing challenges posed by global warming and its associated disparities (Latif & Sajjad, 2018; D'Amato & Falivena, 2019). This action-oriented approach not only benefits society and the environment but also proves to be advantageous for businesses in terms of enhanced performance (Blowfield & Murray, 2014; Sarfraz et al., 2019).

Organizations are increasingly recognizing the importance of incorporating environmental considerations into their corporate objectives, driving a shift in business practices and garnering attention from both academics and practitioners focused on workplace dynamics (Khan et al., 2019). The present study delves into this realm by investigating the impact of green leadership in enhancing OCBE of employees, operating through mechanisms at both the organizational and individual levels. It underscores the notion that environmental concerns must extend beyond strategic planning and encompass operational practices (Carroll, 2016;). At this level, the behavior of employees holds greater significance than that of upper management (Robertson & Barling, 2017). employee behavior, particularly OCBE, is deemed as crucial as ecological concerns at the highest echelons of the organization (Leung & Rosenthal, 2019; Peng & Lee, 2019). The study of factors influencing employee behavior towards the environment is an area in need of continued research and exploration (Khan et al., 2019; Yuriev et al., 2020).

The extant literature emphasizes that employees' environmental behaviors result from a combination of organizational, supervisory, and individual-level factors (Robertson & Barling 2017). While prior research has predominantly concentrated on individual-level factors, investigations that simultaneously address the underlying mechanisms are limited (Saeed et al., 2019). Recognizing this literature gap, the present research aims to explore the interplay of variables across all three levels: green leadership (at the managerial level), GHRM, GIC (at the organizational level), and OCBE (at the employee level). Moreover, this research seeks to examine GIC as an explanatory mechanism for bridging the gap between Green leadership and OCBE. Studies underscore this need, as there is a scarcity of literature delving into the mechanisms (organizational factors) that link leadership and OCBE (Hameed et al., 2022; Awan et al., 2023; Islam et al., 2021). This particular mechanism remains under-explored (Dumont et al., 2016; Shen et al., 2017), particularly given that GIC is a relatively novel concept (Nisar et al., 2021). While recent literature has begun to focus on GIC (Asiaei et al., 2023; Yusliza et al., 2020; Bazkiaei et al., 2022), its determinants and outcomes are frequently overlooked (Marco-Lajara, 2023). Drawing from the social learning theory (Bandura, 1977) and the Ability-Motivation-Opportunity (AMO) framework as underlying mechanisms, present research posits that GIC mediates the association between green leadership and employees' OCBE, while GHRM moderates this relationship.

The study findings unveil a positive association between green leadership and OCBE. This result is theoretically sound, as it aligns with the principles of social learning theory, which postulates that individuals acquire behavior shapes from their environment (Bandura, 1977). Green leaders, who embody and promote environmentally responsible values and actions in pursuit of organizational objectives, serve as role models for their employees, leading to the adoption of environment-specific discretionary behaviors (Asante et al., 2023; Roscoe et al., 2019). Furthermore, the study also establishes a moderating role of green human resource management practices between green leadership and employees' OCBE. This finding is consistent with prior research (Farrukh et al., 2022; Al-Minhas et al., 2020). Chaudhary et al. (2020) posit that GHRM practices serve as signals from leadership, indicating the perseverance and diligence of the organization's efforts. When an organization emphasizes green practices with a focus on environmental sustainability, employees are more inclined to respond with environmentally conscious behaviors. Studies emphasize that employee behavior is not merely the result of overall organizational

performance but also plays a crucial role in influencing goal achievement, particularly when driven by environmentally-oriented HRM practices (Saeed et al., 2019; Emel & Caliskan, 2019).

The findings of this study are similar to those of Asante (2023) and Nawaz Khan (2023), who suggest that other variables might serve as explanatory factors in the association between green leadership and environmental-specific citizenship behavior of employees. Notably, this research investigates the moderating influence of GHRM in the association between green leadership and OCBE. Past research has examined the explanatory power of various factors such as trust, moral identity, well-being and conscientiousness concerning OCBE (Xu et al., 2016; Bavik et al., 2017; Chughtai et al., 2015). Although, this research introduces a novel perspective by employing GHRM as a contextual factor. Green leaders who prioritize environmental concerns not only value the environment as a critical issue but also view the failure to do so as a policy failure. Consequently, these leaders are more likely to establish systems within their organizations that are environmentally focused, with GHRM being one of these practices.

Moreover, employees tend to respond to the initiatives of green leaders by emulating their behavior and actively participating in environmentally responsible activities. This association is consistent with the social learning theory proposed by Bandura (1977), which posits that employees acquire behaviors from their social environment. Both green leaders and GHRM practices represent supervisor as well as organizational factors that emphasize the importance of environmental responsibility, making them bases of learning for employees, and ultimately inspiring them to adopt environment-specific citizenship behavior.

Furthermore, the present research investigates the significance of GHRM in moderating the association between green leadership and organizational citizenship behavior for the environment with a precise emphasis on the mediating influence of GIC. The results reveal that GHRM practices have a more pronounced impact when individuals perceive them as valuable. Consequently, GHRM practices act as crucial catalysts, not only enhancing the direct impact of green leadership on environment-specific green citizenship behavior but also strengthening their influence through the mediation of green intellectual capital, thereby nurturing a more environmentally responsible organizational culture. This observation is in alignment with the ability-motivation-opportunity theory of Appelbaum et al., 2000, which suggests that this amplification occurs by optimizing the "Opportunity" element. GHRM practices create a supportive environment that empowers employees to effectively utilize their abilities and motivation, thereby reinforcing the positive effect of green leadership on OCBE.

This study's findings are also consistent with previous research where GHRM practices were found to have a positive impact on individual-level outcomes. Like, Dumont et al. (2017) reported that GHRM practices amplify the association between a green workplace climate and citizenship behavior. Similarly, Wayne O'Donohue et al. (2019) noted the enhancing moderating impact of GHRM in fostering employees' ambition for environmental issues. Thus, the study results are consistent with existing literature and the theoretical foundation upon which this research is based.

Theoretical Contribution

Given the growing ecological issues and shifts in organizational strategic objects (D'Amato & Falivena, 2019; Sandler, 2019), there is an increasing need for empirical

studies to guide organizations in achieving sustainability and eco-friendly goals (Shah et al., 2019; Islam et al., 2019; Peng & Lee, 2019). A recent study emphasizes the importance of employees in enhancing the green performance of the business (Sarfraz et al., 2019), with a particular emphasis on employees' extra-role green behavior, which goes beyond their formal job duties, a concept that has gained limited attention (Islam et al., 2021; Roscoe et al., 2019).

In this context, the present study presents a novel research model that elucidates the role of supervisors'-level factors (green leadership), organizational factors (green HRM, Green intellectual capital (GIC), and individual-level factors in employees' environmental citizenship behavior. Notably, there is a shortage of academic literature that delves into the mechanisms predicting such behavior concerning the environment (Hameed et al., 2020; Kim et al., 2019; Gilal et al., 2019). Likewise, the connection between leadership and organizational practices, such as Green HRM, in the past has not gained adequate attention (Saeed et al., 2019; Anwar et al., 2020). This study contributes to filling this gap.

However, it's essential to recognize that organizational and supervisor-level interventions alone are insufficient to drive employee adoption of green behaviors (Hameed et al., 2020), hence, individual-level factors are also crucial (Gilal et al., 2019). In light of these considerations, the present research also examines the mediating impact of GIC in the association between green leadership and employees' citizenship behavior concerning the environment. The study is theoretically grounded in social learning theory (Bandura, 1977) and the ability-motivation-opportunity framework (Appelbaum et al., 2000) to predict employees' green citizenship behavior through the interplay of green leadership and green intellectual capital. In line with SLT, the findings demonstrate that when leaders prioritize environmental issues, employees view them as role models and attempt to emulate their behaviors, including OCBE. Similarly, GHRM practices set an example for employees to engage in extra-role green behaviors.

By employing the AMO theory Appelbaum et al. 2000, GHRM practices optimize the opportunity component, creating a supportive environment for followers to leverage their abilities and motivation, thus reinforcing the positive effect of green leadership on green citizenship behavior. Additionally, GHRM strengthens the connection between green leadership and green citizenship behavior by cultivating green intellectual capital, further amplifying the effect of green leadership. In this role, GHRM acts as a pivotal catalyst, enhancing both the positive influence of green leadership on green citizenship behavior and its impact through the mediation of green intellectual capital, thereby fostering an environmentally responsible organizational culture.

Practical Contribution

In addition to its theoretical contributions, present research imparts useful insights for leadership, particularly in the context of fostering green behaviors among employees. Notably, the critical role of leaders in determining followers' green behaviors is highlighted. The study results underscore the positive effect of green leadership on their followers' engagement in green behavior. Therefore, the appointment of green leadership can effectively elicit the desired outcomes from followers. Asante et al. (2023) emphasize that a leader's role is not isolated but representative of the organization, contributing to the alignment of workplace and employees’ values.

Moreover, leaders would actively participate in shaping the tactical direction of an organization. When an organization adopts green practices through green human resource management, employees are more likely to appreciate this strategic choice and, in response, exhibit green citizenship behavior. In this context, employees are more inclined to willingly follow their leaders and adhere to workplace practices when the role of the leader is in line with the organization's strategic purposes and green performance (Nawaz Khan, 2023).

In light of these results, this study describes that when organizations and leaders embrace pro-environmental behaviors and integrate GHRM practices from the outset, followers are more likely to surpass their conventional roles and engage in environmentally responsible actions. However, such outcomes are not universally common, as organizational dispositional factors, particularly GHRM practices, may significantly influence the effects of individual-level determinants, such as OCBE.

The study's results demonstrate that GHRM practices play a pivotal role in fostering a connection between GIC and employees' engagement in environmental citizenship behavior. Therefore, organizations must prioritize GHRM practices when considering environmental initiatives in the workplace. When recruiting, training, and promoting followers, leadership should take into account the green practices of their workforce as fundamental criteria. Moreover, organizations should openly express their commitment to environmental concerns, as this can attract individuals who share green values, making it easier to identify and nurture high-performing, environmentally conscious employees.

Limitations, and Future Research

While this study suggests valuable theoretical and practical insights, it is important to acknowledge its various limitations. Initially, the data gathering relied on business students who had gained work experience in diverse organizations. Moreover, differences in organizational culture, value systems, and the application of these practices, as well as leadership involvement in green HRM practices, could have had an impact on the results. Furthermore, the study employed time-lagged data, which mitigated issues related to common method variance but may have restricted the ability to establish causal relationships. To mitigate these concerns, future researchers are recommended to perform longitudinal investigations or measure each variable at various time points. Additionally, a multifaceted examination of the downstream impacts of green concerns among upper management and their impact on employees at lower levels would provide valuable insights.

Second, it is worth noting that the concept of GHRM in the context of ecological sustainability is a comparatively recent development (Ahmad et al., 2021) and would require time to affect employee behavior. This study focused on a single explanatory mechanism and a single boundary condition. However, other contextual factors could impact outcomes (Islam et al., 2021) and followers' environmental beliefs as demonstrated by Singh et al. (2020). Future research may study GHRM practices as a mediating variable between leadership styles and follower behavior. Present research studied green leadership, but future studies could explore various positive leadership styles (Saleem et al., 2021; Saeed et al., 2019; Dumont et al., 2017) and may investigate the effects of dark leadership on environmental sustainability.

Moreover, there is potential for further studies to comprise additional explanatory variables such as harmonious environmental passion, as individuals with harmonious

environmental passion may be more inclined to assimilate and pay consideration to workplace green policies. Likewise, ethical attitudes among employees, encompassing factors like moral efficacy, perceived environmental responsibility (Islam et al., 2021), green voice behavior, and moral courage represent critical considerations for future investigations.

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APPENDIX A: Factor Loading, Validity and Reliability

Items	Loading	α	AVE	CR	MSV
GL1	.61	.86	.52	.87	.32
GL2	.65				
GL3	.73				
GL4	.85				
GL5	.71				
GL6	.75				
GIC1	.74	.88	.51	.88	.25
GIC2	.66				
GIC3	.79				
GIC4	.70				
GIC5	.71				
GIC6	.67				
GIC7	.74				
GHRM1	.68	.87	.53	.87	.25
GHRM2	.75				
GHRM3	.76				
GHRM4	.74				
GHRM5	.70				
GHRM6	.74				
OCBE1	.80	.93	.60	.94	.33
OCBE2	.83				
OCBE3	.76				
OCBE4	.81				
OCBE5	.72				
OCBE6	.78				
OCBE7	.79				
OCBE8	.74				
OCBE9	.75				
OCBE10	.78				