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The Green Advantage: Leveraging Leadership and Employee Ownership for Sustainable Business Strategy in Emerging Markets

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ABSTRACT

This research investigates how Green Transformational Leadership (GTL) influences Employee green behavior (GEB), with Green Psychological Ownership (GPO) as a mediator and Green Identity (GI) as a moderator, thereby aligning the study with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 and SDG 13. Using a quantitative, cross-sectional design, data were collected from 347 employees and managers of Small and Medium Enterprises (SMEs) in India via structured questionnaires and analyzed through PLS-SEM. Results revealed that GTL significantly predicts EGB. while GI strengthens this relationship. GPO partially mediated the GTL-EGB link while GI strengthens the GPO-EGB relationship. This study highlights how green transformational leadership fosters employee green behavior through psychological ownership, offering managers a roadmap to design eco-focused leadership and participative practices. By nurturing employees' green identity, organizations can ensure consistent pro-environmental actions, thereby enhancing performance, reducing resource waste, and embedding sustainability into daily operations.

1 | Introduction

As governments, organizations, and communities face the grave issues of climate change, resource depletion, and environmental degradation. Environmental sustainability has become one of the most important concerns for companies in the twenty-first century. By aligning corporate strategies and workplace employee behaviors with the Sustainability Development Goals. Firms can not only mitigate environmental risks but also contribute meaningfully to global sustainability targets (Starik and Rands 1995; Etzion 2007). Sustainability has evolved into a strategic necessity for corporate survival and competitiveness, beyond regulatory compliance and reputational concerns (Ambec et al. 2012). Employees are at the heart of this endeavor, as their daily choices and actions have a big impact on whether sustainability goals are met. Businesses increasingly understand that workers are active change agents who have the power to promote or impede green practices, rather than just carrying out environmental policies (Ones et al. 2018; Stern 2000). As a result, research focus has shifted to comprehending the identity-based leadership and psychological elements that influence employee green behavior (EGB)- described as individual workplace behaviors that reduce damage or improve the environment (Steg and Vlek 2009; Ones and Dilchert 2012; Norton et al. 2015). Businesses depend on workers at all levels of the organization to embrace environmentally friendly practices including recycling, cutting back on waste, conserving energy, and taking part in sustainability projects (Ones et al. 2018). According to earlier studies, adopting environmentally conscious practices enhances financial performance (Orlitzky et al. 2003), staff commitment (Erdogan et al. 2015), corporate reputation

(Brammer and Pavelin 2006), and ecological consequences (Jabbour et al. 2010). Therefore, knowing how to promote and maintain EGB is important from a theoretical and practical standpoint. Psychological ownership (PO) is one intriguing psychological process that explains why workers participate in certain behaviors. Psychological ownership is a condition when people feel connected to and possessive of a target, making them feel as though it is "mine" (Pierce et al. 2003). PO has been extended to work domains where people sense ownership over their jobs, ideas, or projects (Brown and Robinson 2011; Baer and Brown 2012; Brown et al. 2014; Zhao et al. 2025). PO was first researched in relation to tangible property and organizational resources (Furby 1978; Dittmar 1992). This study presents the idea of Green Psychological Ownership (GPO), which applies the logic of psychological ownership to environmental circumstances. It shows the degree to which workers feel personally accountable and in control of the sustainability and green activities of their company. As such may help in promoting pro-environmental behavior (Aukhoon et al. 2024). While GPO shares conceptual space with constructs like Green Organizational Commitment and Green Psychological Climate, it remains distinct. Green psychological climate refers to employees' shared perceptions of the organization's policies and procedures, representing an external contextual factor (Shah et al. 2021). In contrast, GPO is an internal psychological state of "mineness" and possession. Similarly, while green commitment reflects an affective attachment to the organization, GPO implies a stronger sense of personal agency and right to influence (Elshaer et al. 2024). Finally, personal norms represent the feeling of moral obligation ("I ought to do this") (Krettenauer and Lefebvre 2021), whereas GPO represents the sense of possession that triggers this obligation (Kim et al. 2021; Morewedge 2021). Although earlier studies have looked into psychological ownership in connection to leadership and employee behavior (Dawkins et al. 2017; Chang and Hung 2021), the concept of GPO has not yet been developed or put to the test. Therefore, this research contributes to the body of literature.

A key element in influencing the attitudes and behaviors of employees toward the workplace is leadership. Green transformational leadership (GTL), out of all the other types, has become a particularly useful indicator of sustainability results. According to Bass and Bass Bernard (1985), and Mittal and Dhar (2016) transformational leadership entails expressing a compelling vision, motivating followers, encouraging critical thinking, and offering tailored support. In the environmental sphere, GTL represents leaders who prioritize green principles, provide an example of eco-friendly behavior, and inspire followers to work toward sustainability objectives (Robertson and Barling 2013; Shah et al. 2021; Ramus and Steger 2000). The mechanism of internalization is an important theoretical question that has not been addressed despite the established connection between green behavior and leadership. The majority of the literature currently in publication sees workers as reactive followers who obey orders from leaders. It does not, however, explain how an internal sense of "mineness" and personal accountability is converted from external leadership. Although ownership and leadership account for a large portion of the tale, employees' perceptions of sustainability as being essential to their self-concept vary. The significance of green identity (GI), or how much employees define themselves in terms of pro-environmental ideals, is highlighted by this (Farrukh et al. 2022; Stabell 2021). With its roots in social identity theory, green identity GI is an interpretive framework that directs behavior by coordinating individual identification with the environmental objectives of the organization (S. J. Schwartz 2001; Van der Werff et al. 2013; Panda 2023). Because eco-friendly actions align with their self-definition, employees who have strong green identities are more likely to transfer feelings of ownership into tangible behaviors. On the other hand, even personnel who feel a sense of psychological ownership over green efforts could not always take action when GI is weak. According to research, green identity is shaped by organizational culture and leadership (Albert et al. 2000; Chen 2011; Chang and Chen 2013), and pro-environmental behavior and intention are positively correlated with GI (Iqbal et al. 2025). However, there is still a lack of empirical research examining GI as a moderator, therefore it is unclear if it enhances the GPO → EGB route.

By combining these viewpoints, the current study creates and evaluates a model of moderated mediation in which GI moderates the mediating connection and GTL predicts EGB through GPO. According to this paradigm, GTL serves as a contextual motivator that gives workers a feeling of pride in their environmental projects. In turn, GPO functions as the psychological process that may help leadership to inspire environmental actions. It is anticipated that GI will increase this indirect effect by making sure that, when in line with employees' self-concept, sentiments of ownership are manifested as behaviors. The literature benefits from this integrated viewpoint in a number of ways. By bringing psychological ownership into the environmental sphere and establishing it as a crucial mediator between employee outcomes and leadership, it first advances research on psychological ownership. In contrast to general ownership notions, GPO emphasizes how environmental responsibility plays a special role in influencing employee behavior. Second, by elucidating the ways in which GTL impacts sustainability outcomes—going beyond direct consequences to pinpoint the psychological mechanisms underlying this influence—it enhances the leadership literature. Third, it advances identity research by examining GI as a border condition, emphasizing that identity centrality is necessary for the conversion of ownership into behavior. Lastly, the study offers useful information for businesses, especially small and medium-sized businesses (SMEs), which rely mostly on employee-driven projects but frequently lack official sustainability structures (Jabbour et al. 2019). The study provides useful advice for managers looking to improve environmental performance by demonstrating how ownership, identity, and leadership work together to promote GEB. The conceptual model is presented in Figure 1.

2 | Theoretical Underpinning and Literature Review

The current study explains how leadership, psychological ownership, and identity work together to promote employee green behavior (GEB) using the Norm Activation Model (NAM) (S. H. Schwartz 1977). NAM holds that moral standards

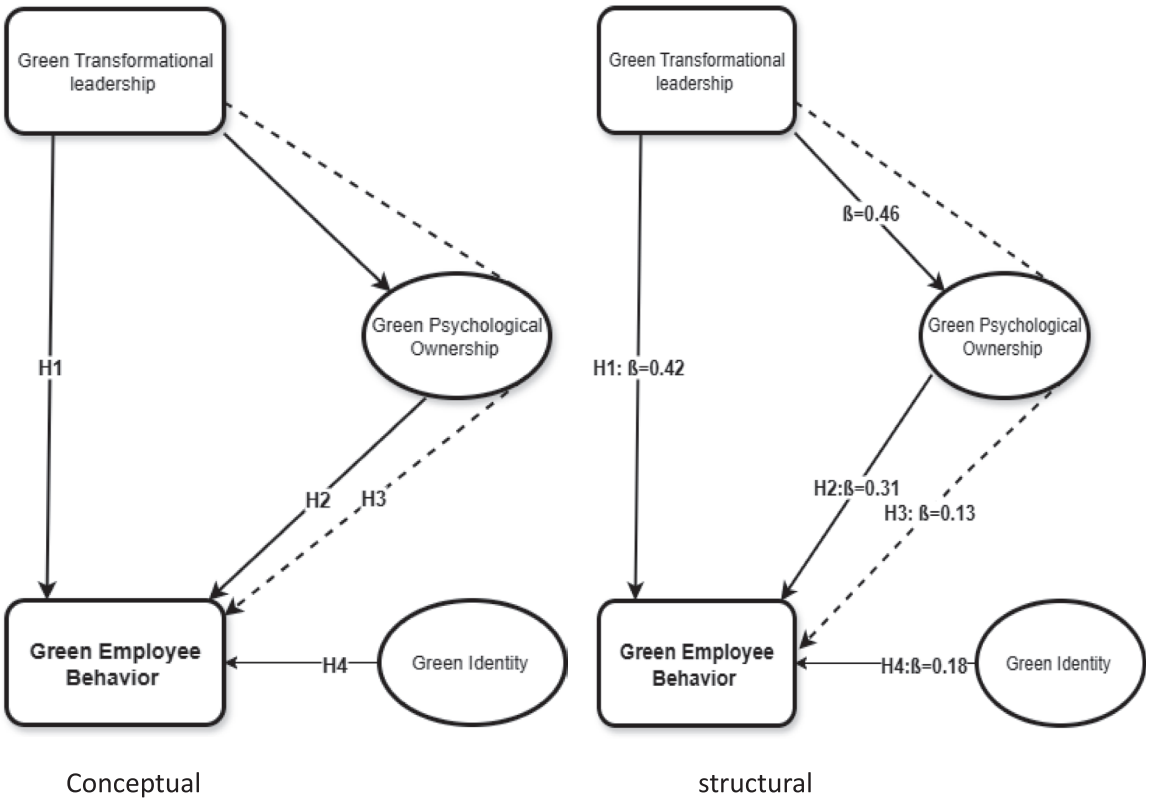

FIGURE 1 | Conceptual and structural model.

influence people's behavior when they (a) understand the repercussions of their actions (awareness of consequences, AC), (b) feel personally accountable for those repercussions (ascription of responsibility, AR), and (c) feel compelled to act (personal norms, PN) (Schwartz and Howard 1981). In this way, NAM sets itself apart from rational-choice viewpoints like the theory of planned behavior by emphasizing the moral forces that shape behavior. When it comes to workplace sustainability, NAM contends that eco-friendly behaviors are the result of employees. It realizes that the effects their actions have on the environment, which accepts the responsibility for reducing those effects, and internalizing a moral commitment to adopt green practices. This reasoning is supported by empirical research. For instance, Zhang et al. (2024) discovered that employees' energy-saving behavior was predicted by their personal norms. Which were mediated by their awareness of the consequences and their attribution of responsibility. Therefore, NAM offers a strong foundation for comprehending how psychological and contextual elements influence GEB. We chose the norm activation model (NAM) over frameworks like social exchange theory (SET) or self-determination theory (SDT) because employee green behavior (EGB) is essentially a pro-social, altruistic behavior rather than a transactional exchange. SET may not adequately convey the moral imperative that underpins sustainability, even though it explains behaviors based on reciprocity. Our model operationalizes the NAM logic, despite not directly measuring awareness of consequences (AC) and ascription of responsibility (AR). While green psychological ownership captures the internalized responsibility and personal norm, green transformational leadership acts as the external stimulus that raises awareness. We propose that GPO is the mechanism by which the employee experiences the moral obligation outlined in NAM on a psychological level.

2.1 | Green Transformational Leadership (GTL) and Employee Green Behavior (EGB)

Green transformational leadership (GTL), a transformational style that is specifically focused on environmental goals, has long been recognized as a strong predictor of employee green behavior (EGB) zion (Egri and Herman 2000). It is also a strong antecedent of prosocial and discretionary workplace behaviors. GTL promotes voluntary green actions including recycling, energy saving, and involvement in eco-initiatives by communicating organizational values and establishing a motivating environment for sustainability initiatives (Robertson and Barling 2013; Ones and Dilchert 2012; Barling et al. 2002). The favorable GTL–EGB relationship across sectors and measuring methodologies is supported by an expanding body of empirical research (Wang et al. 2018; Robertson and Barling 2015; Graves et al. 2013). Environmentally-specific transformational leadership raises employees' pro-environmental intents and behaviors, according to fundamental research by Robertson and Barling (2013). Reviews and meta-analyses support this effect: A meta-analysis by Ren et al. (2024) demonstrates a constant, favorable correlation between different pro-environmental results and transformational leadership aimed at environmental aims. Furthermore, field studies show that GTL predicts specific behavioral outcomes, such as increased recycling rates, more eco-improvement recommendations, and better engagement in sustainability initiatives, frequently through contextual and psychological mediators (Liu and Yu 2023; Perez et al. 2023).

Three main processes are identified by research as the ways in which GTL affects EGB. First, sense-making and meaning: GTL increases employees' moral and motivational engagement with green practices by elucidating the environmental effects of actions and framing sustainability as a shared, meaningful purpose (Robertson and Barling 2013). In the second area, social learning and role modeling, employees pick up and imitate eco-friendly behaviors from leaders who exhibit them (Ramus and Killmer 2007). Third, enabling and support: transformational leaders break down barriers by giving green action resources, recognition, and autonomy. This is a crucial route in environments with limited resources, such as SMEs (Jabbour et al. 2019; Perez et al. 2023). Both separately and as mediated chains (e.g., GTL → green climate/motivation → EGB) have been found for these pathways. The GTL–EGB relationship's strength is influenced by contextual factors. Since leaders have a direct impact on norms, priorities, and resource allocation, SMEs—which frequently lack institutional sustainability infrastructures—seem particularly vulnerable to leadership influence (Jabbour et al. 2019). The translation of leadership signals into behavior can also be enhanced or diminished by individual-level elements as psychological ownership of environmental projects (Chang and Hung 2021) and green identity (Farrukh et al. 2022). Given the consistent positive associations across studies, contexts, and measurement methods, it is theoretically and empirically justified to posit the following hypothesis.

H1. *Green transformational leadership is positively related to employee green behavior.*

2.2 | Green Psychological Ownership and Employee Green Behavior

PO is partially caused by an emotional bond with the target that surpasses the target's cognitive assessment. Additionally, despite possible overlap, PO is very different from legal ownership (Pierce et al. 2003). Legal ownership, for example, is acknowledged by others and supported by the law, whereas PO is typically thought of as an internally generated perception and is therefore largely acknowledged by the individual. Since PO is experienced by the individual and the borders of ownership are established by them, there is no official recognition of PO from others. Others have proposed that PO expresses a perceived feeling of obligation toward the object, which is different from Pierce et al. (2001), who conceptualize PO as reflecting sentiments linked to possessiveness and psychological connection to an object (or portion of an object). People who care about and feel responsible for the target have a stronger sense of ownership, according to Parker et al. (1997). Furthermore, Pierce et al.'s understanding of PO was expanded by Avey et al. (2009) to incorporate the accountability dimension. Lerner and Tetlock (1999) define accountability as "the implicit or explicit expectation that one may be called upon to justify one's beliefs, feelings, and actions to others." In particular, Avey et al. (2009) argued that Psychological Ownership appears when people experience the following: (1) a sense of belongingness and personal identification with the object of ownership; (2) accountability for the object of ownership; and (3) efficacy in working with the object of ownership. According to (Pierce et al. 2001). Psychological Ownership and perceived responsibility are in fact two different states, and a feeling of responsibility or care for an object stems from psychological ownership (PO) rather than constituting a component of it. This conceptualization differs slightly from their theory.

Organizational environments are built more on psychological ownership than legal or actual ownership because psychological ownership is crucial in helping employees adopt particular attitudes and actions (Pierce et al. 2003; Jackson et al. 2011). For example, even though there is no equity in their working organizations, employees may have grown to develop a sense of ownership toward them (Van Dyne and Pierce 2004). Employee stewardship behavior (Avey et al. 2009) and commitment and loyalty (Han et al. 2010) are positively correlated with psychological ownership in corporate settings. Employees' efforts to accomplish organizational goals and cultivate pro-environmental attitudes are also positively impacted by a sense of ownership (Kamleitner and Rabinovich 2010; Jussila et al. 2015). Additionally, psychological ownership helps workers comprehend their roles and duties inside the company. Additionally, it results in their extra-role conduct (Mustafa et al. 2015), encompassing employee green behavior (Dumont et al. 2017), and citizenship behavior (Anwar et al. 2020; Kim et al. 2021). According to Süssenbach and Kamleitner (2018), psychological ownership is a useful instrument that could encourage environmentally friendly behavior and counteract structural barriers to sustainable development. Even while prior research has established an empirical connection between psychological ownership and employee green behavior (EGB), little is known about it, particularly when it comes to the employees of SMEs' particular green psychological ownership. The aforementioned argument contributes to the following hypothesis:

H2. *Green Psychological ownership is positively related to employee green behavior.*

2.3 | Green Transformational Leadership and the Mediating Role of Green Psychological Ownership

Green transformational leadership (GTL), focused on environmental objectives, engages staff in sustainability decision-making, models pro-environmental behavior, and communicates corporate priorities (Bass and Bass Bernard 1985; Robertson and Barling 2013). According to Pierce et al. (2003), Avey et al. (2009) and (Avey et al. 2012) these leader behaviors increase employees' perceived influence over green initiatives, clarify environmental consequences, and foster shared responsibility—conditions that promote feelings of psychological "Mineness" toward environmental targets. The relationship between GTL and GPO is rooted in the "routes to ownership" framework proposed by Pierce et al. (2001), which identifies control, intimate knowledge, and self-investment as the key drivers of psychological ownership. Green Transformational Leaders actively facilitate these routes. First, by intellectually stimulating employees and involving them in eco-decision making, GTL provides the control and autonomy necessary for ownership to emerge (Maitlo et al. 2022). When leaders ask for input on saving energy, employees feel they "own" the resulting solution. Second, by communicating a clear green vision, leaders increase employees' intimate knowledge

of the organization's environmental goals, making the distant corporate target feel familiar and personal (Afsar et al. 2020). Third, by encouraging "green crafting" and recognizing individual efforts, leaders allow for self-investment, where employees see their own identity reflected in the organization's success (Snyder and Cistulli 2021). Thus, GTL is not just an antecedent; it is the architect of the environment that allows psychological ownership to flourish. Employees internalize accountability for sustainability objectives and form emotional and cognitive bonds with green initiatives and practices when psychological ownership is tailored to the environmental domain (e.g., green psychological ownership; GPO) (Chang and Hung 2021). There are two stages to the mediation argument. First, by offering vision, role modeling, inclusion, and acknowledgment for environmental activities, GTL establishes the relational and contextual antecedents of PO (Robertson and Barling 2013; Fatoki 2023). According to empirical research, employees have more ownership over green efforts when their leaders support and participate in them (Jussila et al. 2015; Chang and Hung 2021). Second, PO encourages stewardship and voluntary green behaviors since workers are more inclined to devote time and energy to preserving and enhancing environmental projects when they see them as "theirs" (Pierce et al. 2003; Dumont et al. 2017; Süssenbach and Kamleitner 2018). According to recent field data, PO is also associated with greater rates of recycling, energy conservation, and involvement in sustainability initiatives (Chang and Hung 2021; Dumont et al. 2017). Combining these results, leadership-induced ownership provides a tenable psychological mechanism via which GTL results in green behavior from employees Accordingly, we predict the following mediation:

H3. *Green psychological ownership mediates the positive relationship between green transformational leadership and employee green behavior.*

2.4 | Moderating Role of Green Identity on the GPO → EGB Link

It is important to clarify why Green Identity is theorized to moderate the GPO → EGB link. The conditions for ownership are established by GTL, which acts as an external, distal trigger. However, it is a self-regulatory process that depends on the employee's self-concept to translate that psychological state (GPO) into observable behavior (EGB) (Tung et al. 2017; Rupp et al. 2013). During this stage of enactment, Green Identity serves as a filter. Even if an employee has a strong sense of ownership (high GPO), they might not act in an overtly green manner if it goes against or is unrelated to their basic identity (Xu and Ma 2016). Therefore, GI plays a crucial role in determining whether the internalized sense of possession is strong enough to manifest as action, but it does not necessarily alter how one perceives the leader. Green identity (GI) is a measure of how much a person's self-concept revolves on pro-environmental ideals (Farrukh et al. 2022). According to identity theory and empirical research on environmental self-identity, identity enhances the conversion of psychological states and attitudes into behavior since self-congruent behaviors are more likely to be carried out and sustained (Aquino and Reed II 2002; Van der Werff et al. 2013). For two reasons, GI should increase the impact of GPO on behavior in the ownership context. According to Van der Werff et al. (2013), motivational consistency is first enhanced by identity–behavior congruence. When "being green" is a part of an individual's identity, ownership feelings provide cognitive–affective pressure to act in ways that support that self-definition. Second, GI increases moral motivation and norm salience, which is consistent with NAM logic. As a result, high-GI personnel have greater personal norms and obligations when they have environmental goals (S. H. Schwartz 1977; Van der Werff et al. 2013). Research indicates that environmental self-identity strengthens the conversion of concern and efficacy into observable pro-environmental acts and moderates attitude–behavior linkages (Van der Werff et al. 2013; Conchie and Donald 2009). This study uses the self-consistency principle to combine NAM and Social Identity Theory (SIT). SIT explains the strength of the behavioral enactment, whereas NAM explains the creation of a moral obligation through ownership (GPO). People try to match their behavior with their fundamental self-concept, according to SIT. Green identity thus serves as a boundary condition for the NAM process: when "being green" is central to the employee's self-definition (SIT), the moral norms activated by GPO (NAM) are most potent. By establishing Identity as the owner-norm's validator, this integration closes the gap between "feeling ownership" and "taking action." Thus, when employees have a strong sense of their green identity, the same level of ownership will more consistently result in green behavior. Therefore, we posit:

H4. *Green identity moderates the relationship between green psychological ownership and employee green behavior such that the relationship is stronger when green identity is high (vs. low).*

3 | Research Methodology

This study employs a quantitative research approach to investigate the mediating role of Green psychological ownership (GPO) in the relationship between Green Transformational leadership (GTL) and employee green behavior (EGB) within small and medium enterprises (SMEs) in India. The research design incorporates a cross-sectional survey methodology to collect data from employees and managers across various SME sectors in the region.

3.1 | Sampling Strategy

The study targets employees and managers of Small and Medium Enterprises (SMEs) operating across the manufacturing and service sectors throughout India. The sampling frame is constructed using official data sources, including the Ministry of MSME's Udyam Registration Portal, regional Chambers of Commerce and Industry databases, and state-level industry department listings. These sources provide comprehensive and up-to-date information on registered SMEs across different regions of the country. A stratified random sampling technique is employed to ensure balanced representation across key dimensions. Specifically, the population is stratified based on industry type (manufacturing versus service) and enterprise size (10–50 employees versus 51–250 employees). This stratification enhances the diversity of the sample and improves the generalizability of the findings across the broader Indian SME landscape.

The sample size is determined using Krejcie and Morgan's table for sample size estimation, targeting 300–350 respondents at a 95% confidence level, assuming a medium effect size. To ensure consistency and relevance of responses, the study includes only those SMEs that have been officially registered and operating in India for at least 3 years, are actively engaged in environmental or sustainability initiatives, and employ full-time workers or managers with a minimum tenure of 1 year. These inclusion criteria ensure that the participants possess adequate organizational experience and familiarity with workplace sustainability practices, thereby contributing to the reliability and depth of the data collected.

3.2 | Measurement Scales

The study employs validated scales to measure key constructs, adapted to align with the research context. Green psychological ownership (GPO) was assessed using a modified version of Van Dyne and Pierce's (2004) psychological ownership scale, grounded in Pierce et al.'s (2003) conceptualization of ownership as a sense of possession and responsibility. This adaptation incorporates environmental-specific items to capture employees' attachment to sustainability practices. Employee green behavior was measured using Roy and Sia's (2024) scale, which evaluates eco-conscious actions in workplace settings. For green transformational leadership (GTL), Robertson's (2018) Environmentally Specific Transformational Leadership scale was adopted, assessing leaders' ability to inspire green values and behaviors. Finally, green identity was operationalized using Chen's (2011) scale, which examines the extent to which employees integrate environmental values into their self-concept. All scales utilized 5-point Likert responses (1 = Strongly Disagree, 5 = Strongly Agree), ensuring consistency and enabling quantitative analysis of the hypothesized relationships.

3.3 | Model Assessment

We employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS for three study-specific reasons. First, in line with Hair et al. (2019), PLS-SEM is favored for studies whose main goals are theory development and prediction, which is in line with our objective of investigating the unique mediating function of Green Psychological Ownership. Second, without imposing strict distributional assumptions, the approach works well for complex structural models involving moderated mediation. Third, because the indicators function as expressions of underlying latent psychological states, we defined all constructs as reflective measurement models. Lastly, we thoroughly evaluated multicollinearity by looking at the Inner Variance Inflation Factor (VIF) values for each predictor. Since all VIFs stayed below the 5.0 threshold, we were able to confirm that lateral collinearity did not skew the structural results.

3.4 | Common Method Variance Assessment

Since data for both independent and dependent variables were collected from a single source, we addressed potential Common Method Variance (CMV) through procedural and statistical means. Procedurally, we assured participants of anonymity and used established, validated scales to reduce ambiguity. In terms of statistics, we used the Full Collinearity Assessment method (Kock 2015), which is thought to be more reliable than the conventional Harman's Single Factor test for PLS-SEM. For every latent variable in the structural model, we looked at the Variance Inflation Factor (VIF) values. As shown in Table 3 the Inner VIF values for Green Transformational Leadership (3.42) and Green Psychological Ownership (3.65) marginally exceeded the conservative threshold of 3.3 suggested by Kock (2015) for common method bias detection, according to our analysis of the collinearity statistics. These values, however, are still well within the 5.0 acceptable threshold for structural model assessment that Hair et al. (2019) and Hair et al. (2017) recommend. A moderate level of correlation is anticipated given the theoretical relatedness of ownership and leadership constructs. We conclude that the model does not suffer from critical collinearity or pervasive common method variance because all VIFs are below 5.0 and our measurement model verified discriminant validity.

TABLE 1 | Instrument reliability results.

Construct	CR	α	AVE	Factor loadings
Green psychological ownership (GPO)	0.92	0.91	0.68	0.72–0.86
Employee green behavior (EGB)	0.94	0.93	0.62	0.68–0.88
Green transformational leadership (GTL)	0.91	0.90	0.65	0.71–0.87
Green identity (GI)	0.89	0.88	0.70	0.76–0.88

TABLE 2 | Correlation matrix.

Variable	M	SD	1	2	3	4
1. GPO	3.82	0.71	1			
2. Green behavior	4.05	0.63	0.52**	1		
3. GTL	3.91	0.68	0.46**	0.58**	1	
4. Green identity	4.12	0.59	0.38**	0.49**	0.42**	1

Note: ** $p < 0.001$.

3.5 | Assessment of Measurement Model

The psychometric properties of all measurement scales were rigorously examined to ensure both reliability and validity in measuring their respective constructs. As shown in Table 1 and Table 2, all scales demonstrated excellent internal consistency, with composite reliability (CR) scores ranging from 0.89 to 0.94, well above the recommended threshold of 0.70 (Hair et al. 2019). Similarly, Cronbach's alpha (α) values between 0.88 and 0.93 further confirmed the high reliability of all scales.

These results indicate that the items within each scale consistently measured the same underlying construct, with minimal measurement error.

TABLE 3 | Model fit, predictive power, effect sizes, and inner VIF values.

Construct/ relationship	R^2	f^2	Q^2	Interpretation
Endogenous variables				
Green employee behavior	0.57	—	0.43	Large explanatory/ predictive power
Green psychological ownership	0.49	—	0.37	Moderate-high power
Effect sizes				
GTL → green behavior	—	0.28	—	Large effect
GPO → green behavior	—	0.15	—	Medium effect
GI × GPO interaction	—	0.06	—	Small but significant
Model fit				
SRMR	—	—	—	0.06 (Good fit)
NFI	—	—	—	0.91 (Good fit)

Inner VIF values		
Predictor construct	**Dependent construct: Green psychological ownership (GPO)**	**Dependent construct: Employee green behavior (EGB)**
Green transformational leadership (GTL)	1.000	**3.42**
Green psychological ownership (GPO)	—	**3.65**
Green identity (GI)	—	1.89

Note: Bold values indicate $p < 0.001$.

Convergent validity was established through two primary indicators. First, the average variance extracted (AVE) for all constructs exceeded the 0.50 benchmark (Fornell and Larcker 1981), ranging from 0.62 to 0.70. This demonstrates that more than 50% of the variance in the observed variables was accounted for by the latent constructs. Second, all factor loadings were statistically significant ($p < 0.001$) and ranged between 0.68 and 0.88, with the majority exceeding the recommended 0.70 threshold (Hair et al. 2017). While one item in the employee green behavior scale loaded at 0.68, it was retained due to its theoretical importance and the scale's otherwise strong psychometric properties. The results meet contemporary standards for scale validation in organizational research (e.g., Podsakoff et al. 2016), demonstrating that the measures are both reliable (producing consistent results) and valid (measuring what they purport to measure). The psychometric evidence supports the robustness of the findings and their potential contribution to the green HRM literature. Future research could build on these measurement approaches while potentially refining specific items to achieve even higher factor loadings across all scales.

3.6 | Structural Model Assessment

The structural model, as presented in Table 4, was evaluated in accordance with the PLS-SEM guidelines proposed by Hair et al. (2019). The inner model assessment as shown in Table 3 involved examining key metrics including collinearity, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), path coefficients (β), inner VIF and their statistical significance.

The structural model demonstrated acceptable fit indices, with a Standardized Root Mean Square Residual (SRMR) of 0.06 and a Normed Fit Index (NFI) of 0.91, indicating a good model fit.

The model exhibited substantial explanatory and predictive power. Specifically, Employee green behavior had an R^2 of 0.57 and Q^2 of 0.43, reflecting strong variance explained and predictive relevance. Similarly, GPO showed a moderate-to-high explanatory power ($R^2 = 0.49$, $Q^2 = 0.37$).

3.7 | Direct, Indirect, and Moderation Effects

As shown in Table 4 and Figure 1 all hypothesized paths were significant. Green Transformational Leadership (GTL) had a strong direct effect on green behavior ($\beta = 0.42$, $p < 0.001$), while Green Psychological Ownership (GPO) also significantly

TABLE 4 | Direct, indirect, and moderation effects.

Type	Relationship	β	p	95% CI	Supported?
Direct	GTL → green behavior	0.42	< 0.001	[0.36, 0.48]	Yes (H1)
	GPO → green behavior	0.31	0.003	[0.22, 0.39]	Yes (H2)
Indirect	GLT → GPO → behavior	0.13	0.012	[0.04, 0.21]	Partial mediation
Moderation	GI × GPO → behavior	0.18	0.023	[0.05, 0.30]	Yes (H3)
High GI (+1 SD)	$\beta = 0.39$, $p < 0.001$		Stronger GPO-behavior link		
Low GI (−1 SD)	$\beta = 0.21$, $p = 0.032$		Weaker GPO-behavior link		

predicted green behavior ($\beta = 0.31$, $p = 0.003$), supporting hypothesis H1 and H2. The mediation analysis revealed a significant indirect effect of GTL on green behavior through GPO ($\beta = 0.13$, $p = 0.012$), indicating partial mediation, supporting hypothesis H3. The moderation analysis showed a significant interaction effect between GI and GPO on green behavior ($\beta = 0.18$, $p = 0.023$). The GPO–behavior relationship was stronger at high levels of GI ($\beta = 0.39$, $p < 0.001$) compared to low GI ($\beta = 0.21$, $p = 0.032$), confirming hypothesis H4.

3.8 | Effect Sizes

The Table 3 shows effect size (f^2) estimates revealed that GTL had a large effect ($f^2 = 0.28$) and GPO a medium effect ($f^2 = 0.15$) on green behavior. The interaction term GI × GPO had a small but meaningful effect ($f^2 = 0.06$).

4 | Discussion of Results

The findings offer strong empirical support for the hypothesized relationships and contribute to the growing body of research on green organizational behavior. The results demonstrate that GTL has a significant positive effect on green behavior ($\beta = 0.42$, $p < 0.001$), which is consistent with previous studies suggesting that transformational leadership is related to environmental values and behaviors among followers (Robertson and Barling 2013; Singh et al. 2020). Transformational leaders inspire employees to transcend self-interest for environmental sustainability, and this influence is particularly crucial in embedding green values into day-to-day organizational conduct. In parallel, GPO was found to be significantly related to green behavior ($\beta = 0.31$, $p = 0.003$), reaffirming the notion that when employees feel psychological ownership toward environmental initiatives, they are more likely to engage in sustainable behaviors (Avey et al. 2009; Pierce et al. 2001). This finding supports the conceptual distinction of GPO as a domain-specific extension of psychological ownership and underlines its practical relevance in promoting eco-friendly behaviors in organizational settings. Moreover, the partial mediation effect of GPO ($\beta = 0.13$, $p = 0.012$) suggests that GTO enhances employees' identification with environmental values, which in turn encourages green behavioral engagement. This aligns with identity theory (Ashforth and Mael 1989) and prior findings where GPO served as a mechanism through which psychological and contextual factors are related to behavior (Van der Werff et al. 2013). The moderation analysis revealed that GI significantly strengthened the relationship between GPO and green behavior (interaction $\beta = 0.18$, $p = 0.023$). Under high GI, the GPO–behavior link was stronger ($\beta = 0.39$), whereas under low GI, the effect was weaker ($\beta = 0.21$). These results suggest that when employees strongly identify with environmental values, their sense of green psychological ownership is more effectively related to green behaviors, as acting sustainably aligns with their self-concept. Conversely, when green identity is weak, ownership feelings alone are insufficient to drive consistent eco-friendly actions, resulting in a weaker effect. The model's strong explanatory and predictive power ($R^2 = 0.57$, $Q^2 = 0.43$ for green behavior) and good model fit indices (SRMR = 0.06, NFI = 0.91) further reinforce the robustness of the proposed framework. The effect sizes (f^2) also confirm the practical significance of GTL and GPO, with f^2 values of 0.28 and 0.15, respectively, while the interaction effect had a small but meaningful effect ($f^2 = 0.06$). This moderation's effect size ($f = 0.06$) is significant in the context of non-experimental field research, despite being statistically categorized as small (Cohen 1988). According to Aguinis et al. (2005), because of measurement error and the loss of residual variance, moderation effects in field studies are often hard to find and produce small effect sizes. Practically speaking, this "small" effect translates into a significant difference in organizational outcomes: the slope analysis shows that the influence of ownership on behavior is almost twice as strong for employees with a strong Green Identity as it is for those with a weak identity. Therefore, managers can identify specific employee segments where their leadership efforts will yield the highest return, even with a modest interaction effect. Collectively, these findings highlight the importance of both leadership and employee psychological constructs in fostering green behavior. They also extend the theoretical understanding by empirically validating a moderated mediation model grounded in norm activation theory and social identity theory. Importantly, the results suggest that organizations aiming to promote sustainability should not only focus on structural changes but also invest in leadership development and mechanisms to foster psychological ownership and green identity among employees.

5 | Contribution

This study makes several important theoretical contributions to the literature on organizational sustainability and employee green behavior. First, it extends psychological ownership theory (Pierce et al. 2003) into the environmental domain by conceptualizing and empirically testing green psychological ownership (GPO) as a mediating mechanism. While prior studies have linked transformational leadership to pro-environmental outcomes (Robertson and Barling 2013; Ren et al. 2024), the psychological process through which employees internalize sustainability initiatives as "theirs" has been underexplored. By establishing GPO as the conduit between leadership and behavior, this study advances a more nuanced understanding of how employees' felt responsibility for green initiatives translates leadership signals into concrete action. Second, it enriches the leadership literature by demonstrating that green transformational leadership (GTL) not only directly shapes employee green behavior but also operates indirectly through ownership, highlighting the dual motivational and psychological pathways of leadership influence. Third, the study contributes to the identity perspective by positioning green identity (GI) as a boundary condition that moderates the ownership–behavior link. This integration clarifies why ownership does not always lead to prosocial outcomes and shows that identity centrality determines whether ownership translates into sustained green behavior. Finally, by embedding leadership, ownership, and identity within a single framework, the study responds to calls for more integrative models in green HRM and organizational behavior (Ones and Dilchert 2012), thereby offering a richer explanation of the antecedents of employee sustainability practices.

Beyond advancing theory, this study provides actionable insights for organizations seeking to integrate sustainability into daily operations while aligning with the United Nations

Sustainable Development Goals (SDGs). First, the results show that green transformational leadership (GTL) is a powerful lever for encouraging employee green behavior (EGB). Practically, organizations can design leadership training programs that equip managers to communicate a compelling environmental vision, role-model eco-friendly practices, and empower employees in sustainability initiatives. Such practices not only enhance organizational performance but also directly support SDG 12 (Responsible Consumption and Production) by reducing waste and promoting efficient resource use.

Second, by demonstrating the mediating role of green psychological ownership (GPO), the study highlights the importance of involving employees in green decision-making and giving them a genuine sense of responsibility for environmental outcomes. Managers can foster ownership through participative initiatives, recognition of eco-contributions, and autonomy in implementing green projects. These interventions strengthen employee engagement, contributing to SDG 8 (Decent Work and Economic Growth) by creating meaningful work experiences that align individual motivation with organizational sustainability goals.

Third, the moderating role of green identity (GI) suggests that sustainability programs should also address values and identity formation. Organizations can nurture employees' environmental self-concept through awareness campaigns, sustainability-focused HRM practices, and green organizational culture. Such efforts ensure that ownership feelings are more consistently translated into behavior, thereby enhancing the organization's ability to mitigate environmental risks and address SDG 13 (Climate Action).

Fourth, Stakeholders must implement targeted, quantifiable interventions in order to operationalize these conceptual alignments. By incorporating "Green Psychological Ownership" into yearly engagement surveys as a tracked Key Performance Indicator (KPI) and connecting increases in ownership scores to observable decreases in operational waste, managers can further SDG 12. By offering incentives for "Green Leadership" accreditation programs, where government support is linked to quantifiable results—like the adoption of circular economy practices or verifiable carbon mitigation (SDG 13)—rather than passive regulatory compliance, policymakers and SME support organizations can operationalize SDGs 8 and 17. This change guarantees that identity and leadership constructs are viewed as measurable forces behind national sustainability goals rather than merely as soft skills.

Finally, this integrative framework not only improves internal organizational practices but also strengthens cross-sector collaborations. By showing how leadership, ownership, and identity can be mobilized to foster sustainability, the study provides evidence-based strategies that support SDG 17 (Partnerships for the Goals), offering a foundation for governments, industries, and NGOs to collaborate in achieving broader sustainability objectives.

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