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Article

The employee green behavior of green transformational leadership, green human resource management on the sustainable performance

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Abstract: This research explores the impact of employee green behavior on green transformational leadership (GTL) and green human resource management (GHRM), and their subsequent effects on sustainable performance within organizations. Utilizing a sample of 482 environmental quality promotion departments across Thailand, the study employs stratified random sampling to ensure representative data collection. Analysis was conducted using SPSS software, applying Ordinary Least Squares (OLS) regression to test the hypothesized relationships between the variables. The findings reveal a positive and significant influence of employee green behavior on both GTL and GHRM. Additionally, both GTL and GHRM are found to positively correlate with sustainable performance, indicating that enhanced leadership and management practices in the environmental domain can lead to better sustainability outcomes. This research utilizes the Ability-Motivation-Opportunity (AMO) theory as its theoretical framework, illustrating how organizations can leverage strategic HRM practices to promote environmental consciousness and action among employees, thereby enhancing their long-term sustainability success. Implications of this study underscore the importance of integrating green practices into leadership and HRM strategies, advocating for targeted training programs and energy conservation measures to boost environmental awareness and performance in the workplace. This contributes to the literature on sustainable performance by providing empirical evidence of the pathways through which green HRM and transformational leadership foster a sustainable organizational environment.

Keywords: employee green behavior; green transformational leadership; green human resource management; sustainable performance

1. Introduction

Environmental sustainability is a critical concern globally, affecting both developed and developing nations. Currently, the United Nations recognizes 193 member states along with two observer states, totaling 195 countries. These nations, categorized by varying Human Development Index (HDI) scores, are witnessing significant environmental challenges, including rising pollution levels, biodiversity loss, and resource depletion. Ahmad et al. (2021) pointed out that customers, employees, suppliers, the government, and trading partners all encourage modern firms to embrace and implement green human resource management (GHRM). In light of recent swift economic advancements, the escalation of resource consumption and environmental challenges has grown markedly severe. Consequently, environmental preservation has emerged as a paramount social imperative globally (Dilchert and Ones, 2012; Nichols and Imbrogiano, 2021).

Numerous industrialized nations are actively pursuing environmental policies aimed at amending energy-intensive manufacturing processes, which are notorious for

their contribution to severe pollution (Hong et al., 2020; Young et al., 2019). A plethora of scholars have dedicated their efforts to advancing technologies geared towards environmental preservation, including waste and water reuse, and the utilization of eco-friendly energy sources (Aboramadan, 2022; Kim et al., 2019). This pursuit encompasses the development of renewable energy sources, environmental modernization, carbon emission reduction, and enhanced environmental outcomes. Moreover, governmental bodies focused on policy implementation, embodying green transformational leadership (Chang, 2022; Samir, 2020), are evolving, thereby bolstering the overall effectiveness of environmental initiatives.

According to Yong et al. (2019), GHRM represents a novel organizational concept devised to preserve and safeguard natural resources. GHRM entails aligning an organization's human resource management strategies with its environmental objectives. As delineated by Benevene and Buonomo (2020), GHRM encapsulates all facets pertinent to the adoption, awareness, and execution of human resource practices fostering sustainability. It involves methods aimed at improving an organization's environmental, financial, and sustainable outcomes.

In a broad sense, "employees' green behavior" describes actions taken by workers with the goal of preserving natural resources and preventing environmental degradation. Reducing environmental deterioration and improving environmental quality are the goals of these efforts (Norton et al., 2015). Amidst an ongoing discourse regarding the societal role of businesses and the degree to which environmental concerns should be prioritized, numerous companies are initiating measures to incorporate sustainability into their strategic implementation processes. This prevailing trend is anticipated to persist in the forthcoming years (Dmytriyev et al., 2021). Although some may argue that this strategy is expensive and will reduce profits in the near term, many businesses have found that it increases efficiency, decreases risk, and boosts reputation and brand value. Companies that show they are committed to sustainability also attract more investors and customers (Sciarelli et al., 2021), giving them a competitive advantage in the market.

Managers and researchers alike have recognized that many factors influence how far companies may go in their pursuit of sustainability (Jeronimo et al., 2020). Both internal and external forces, including regulations, market forces, and stakeholder expectations, play significant roles in these considerations. Internal factors include organizational culture, leadership styles, and staff attitudes. According to Gallego et al. (2022), GHRM is essential in assisting employees in developing their sustainable skills through the use of performance assessment methods. However, the exact mechanism by which GHRM encourages eco-friendly behavior among employees to improve long-term ecologically friendly outcomes remains unclear (Ninga et al., 2023; Yu et al., 2021).

Numerous scholars posit that leadership serves as a mediating factor in the correlation among GTL, GHRM, and employees' environmentally responsible behaviors within environmental initiatives (Farrukh et al., 2022). As a result, this influences long-term efficiency. Consequently, research into the connections between environmentally conscious actions at work is becoming increasingly important for establishing the mediating roles of GHRM and GTL in fostering long-term success.

Green transformational leadership exerts influence by fostering self-motivation

among employees to achieve organizational objectives and unite them in a cohesive manner. Through these behaviors, green transformational leaders can cultivate novel ideas and innovations within their organizations, inspiring team members to tackle challenges creatively (Bass and Waldman, 1991).

Building upon the frameworks of Sensemaking Theory (SA), Ability-Motivation-Opportunity (AMO) Theory, and Social Identity Theory (SIT), and guided by recent systematic reviews (Huang et al., 2021), this study adopts a quantitative research strategy. Specifically, the research employs statistical analyses to investigate the role of these theories in explaining green employee behavior. According to Brown et al. (2008), sensemaking involves a narrative and communicative process that includes verbal articulation and emotional engagement, making it suitable for examining how employees interpret and respond to ambiguous environmental challenges.

In this context, the AMO Theory is hypothesized to enhance employee skills and environmental awareness, thereby increasing their psychological resilience and alignment with organizational sustainability goals (Ercantan and Eyupoglu, 2022). Social Identity Theory suggests that a company's future success hinges on employees' adherence to evolving societal norms. Supporting this, Kim et al. (2019) found that enhanced corporate reputation and status can boost employees' self-esteem and identity, aligning their actions with corporate environmental strategies.

Regarding green transformational leadership, this study quantitatively assesses how leaders interpret environmental challenges and implement Green Human Resource Management (GHRM) programs to promote sustainable practices. The effectiveness of these initiatives is measured by the extent to which employees adopt sustainable behaviors, reinforcing a long-term commitment to environmental stewardship.

In brief, in recent years, the focus on sustainable organizational practices has intensified, driven by escalating environmental concerns and societal expectations. While numerous studies have explored the impact of green transformational leadership (GTL) and green human resource management (GHRM) on organizational performance, a significant gap remains in understanding the direct link between these practices and employee green behavior (EGB) within the framework of sustainable performance. Recent literature suggests that while associations have been made between GTL, GHRM, and organizational sustainability, the mechanisms through which these practices influence individual employee behaviors remain underexplored (Ahmad et al., 2021; Imbrogiano and Nichols, 2021).

This study aims to fill this gap by examining how GTL and GHRM foster sustainable performance as well as, how EGB effect GTL and GHRM. The research questions addressed in this study are: How does green transformational leadership and green human resource management influence sustainable performance? How does employee green behavior influence green transformational leadership and green human resource management?

These questions are vital as they explore the underlying processes that contribute to a sustainable organizational culture, an area that has not been sufficiently addressed in previous studies. By focusing on these dynamics, this study contributes to a deeper understanding of the strategic implementation of GTL and GHRM within corporate

sustainability agendas.

2. Theoretical framework and research hypotheses

Many theories in academic discourse consistently highlight GHRM and employee green behavior across diverse organizational settings. For example, Appelbaum et al. (2000) and Ferrarini and Curzi (2023) put forth the AMO Theory. Scholars are interested in this theory because it has the potential to shed light on many aspects of the connection between companies and their workers. Social Identity Theory states that when people follow social norms, it's because the company is trying to be more productive, which makes them feel good about themselves (Ali et al., 2022; Kim et al., 2019). Similarly, the AMO Theory can help workers become more proficient and environmentally conscious, which in turn increases their mental toughness to participate in actions that help the company reach its goals (Ercantan and Eyupoglu, 2022). Green HRM is important because it fosters sustainability by encouraging environmentally conscious actions and results from employees (Shen et al., 2018; Song et al., 2021). A number of studies have examined how GHRM relates to other concepts; however, there are still certain gaps in our understanding. Research investigates the relationship between GHRM, GTL, and EGB in relation to sustainable performance (Aboramadan, 2022; Chaudhary, 2019).

In the academic community, the AMO theory, which stands for ability, motivation, and opportunities, is becoming more prevalent. It appears that these three characteristics can be utilized together to forecast an individual's or team's performance. This paradigm is one of several that have recently gained traction in the quest to comprehend GHRM linkages (Paauwe, 2008; Muthuswamy, 2023). "Physiological and cognitive competences that enable an individual to efficiently execute a task" (Blumberg and Pringle, 1982) or "knowledge, skills, competencies, and proficiencies possessed by employees" (Kim et al., 2015) are two broad definitions of capability. According to studies conducted by Nwagwu and Nwankwoala (2020) and Van Iddekinge et al. (2017), motivation can be conceptualized as either the willingness and readiness to complete tasks or as a driving force that directs, motivates, and sustains behavior. Opportunity, in the end, is defined as "the field of forces surrounding a person and their tasks that enables or constrains that person's task performance," which are external conditions over which an individual has no influence (Apex-Apeh et al., 2020). The objectives of this endeavor are twofold: to enhance GHRM practices and to delve into the elusive "black box" representing the linkage between high-performance work systems and tangible organizational performance. Improving employees' skill sets is one objective of ability-enhancing GHRM. Some studies have used the term "skill-enhancing GHRM" to describe this type of GHRM (Chuang et al., 2016; Jaškiene and Buciuniene, 2021; Subramony, 2009). Motivating GHRM aims to boost employees' intrinsic motivation. Providing employees with additional opportunities to flourish is the main objective of opportunity-enhancing green HRM (Alshammari et al., 2023; Jiang et al., 2012).

2.1. Sensemaking theory

Organizational contexts naturally contain sensemaking systems. Weick et al.

(2005) discovered that commonly acknowledged individual sensemaking actions constitute the cornerstone of the process. People adjust to signals from their surroundings and from within the business, sort relevant data, spot opportunities and threats, and act appropriately (Azodo et al., 2020). Engaging with the environment and having some control over one's activities and their consequences are two benefits of these time-honored sensemaking practices. Consequently, there exists an ever-evolving mental model (Mohammed et al., 2000) and a dynamic "narrative" (Weick et al., 2005) endeavoring to foster situational awareness across all echelons of an organization, encompassing individuals, teams, and leadership.

Organizational sensemaking systems, both team and individual, can be fostered and developed with the help of these narratives through a number of critical mechanisms (Cristofaro, 2022). Ourick (1993) and Weick et al. (2005) list the organization's processes and structures, selection and training procedures, stresses and workload variables, and resources and systems that enable sensemaking systems as mechanisms. In particular, the organization has a great deal of influence on its members' sensemaking systems through creating a welcoming safety culture, offering work and training programs, deciding on staffing levels, creating societal norms and pressures, implementing policies, setting up organizational structures, strategizing, and establishing goals and tools for coordination (Casey et al., 2022).

According to conventional sensemaking theories, an organization's language plays a crucial role in assessing events and building narratives. The way people express themselves and the words they use can significantly affect the ideas, beliefs, and actions that emerge. Furthermore, as issues develop over time, the language used can become embedded in the ongoing narrative and impact retrospective assessments. Diverse stories come together and find common ground at the group level. Presenting individual tales is just the beginning; this process also includes gathering and sorting remote stimuli, as well as prioritizing them. This method gives various groups a chance to have a collective influence on organizational transformation. One example is the "democratic decision-making" process mentioned by Maes and Von Hootegen (2019) in their research on organizational change. This method emphasizes members' active participation and empowerment during change projects, rather than relying on a formal voting procedure or guaranteeing equal say in the final product.

2.2. Employee green behavior and green transformational leadership

The relationship between employee green behavior and green transformational leadership (GTL) is central to understanding how environmental initiatives within organizations translate into actionable outcomes. Green employee behavior, as defined in the literature, encompasses a wide range of actions that employees undertake, both formally and informally, to support the organization's environmental goals. These actions include routine energy-saving measures, such as turning off unused lights, to more proactive efforts like spearheading recycling programs or suggesting innovative green policies (Campbell and Wiernik, 2015; Yuriev et al., 2022).

Green transformational leaders play a pivotal role in shaping these behaviors by modeling and reinforcing the environmental values of the organization. These leaders are not just figureheads but active participants in the environmental stewardship of the

company. They inspire and engage employees through intellectual stimulation, driving innovation in sustainability practices (Hameed et al., 2021). This type of leadership is characterized by its ability to motivate employees beyond standard expectations, fostering an organizational culture that deeply values sustainability (Chen and Chang, 2013).

Furthermore, the theory of green transformational leadership suggests that such leaders enhance the self-efficacy of their employees, empowering them to undertake environmentally beneficial actions. By setting high environmental standards and visibly meeting them, these leaders cultivate a sense of shared responsibility among the workforces. This phenomenon aligns with the Social Identity Theory, which posits that individuals derive part of their identity from the groups to which they belong. When an organization's leadership exhibits strong environmental values, employees are more likely to adopt these behaviors as part of their identity, thus promoting a green organizational culture (Tajfel and Turner, 1979).

This relationship is further supported by empirical research showing that green transformational leadership is directly linked to improved sustainable practices within organizations. Studies by Afzal et al. (2017) and Mittal and Dhar (2016) demonstrate that when leaders consistently prioritize and communicate the importance of environmental values, they significantly influence employees' behaviors towards sustainability. Therefore, the alternative hypothesis H1 is proposed as per the literature review given above:

Hypothesis 1: Employee green behavior is positively related to green transformational leadership.

2.3. Employee green behavior and green human resource management

As green human resource management (GHRM) develops, it addresses not only environmental issues like waste reduction but also societal and economic ones, such as better work-life balance and higher profitability for individuals and businesses. According to Bahuguna et al. (2022), GHRM is a theory and framework for sustainable human resource management that prioritizes the three bottom lines: social responsibility, environmental responsibility, and financial viability. Using this method ensures that your company can operate smoothly without negatively impacting the environment, society, or the bottom line.

The complex nature of GHRM necessitates evaluation along several aspects. GHRM includes hiring individuals with specific criteria, providing them with training to improve their environmental management abilities, and evaluating their performance and incentives based on their contributions to environmental sustainability (Yong et al., 2019). Environmental performance may be enhanced by collaboration, training, goal-setting, non-monetary incentives, and the promotion of corporate cultures (Jabbour and de Sousa Jabbour, 2016). Companies may improve their environmental performance and contribute to sustainable growth with the help of GHRM's system, which integrates both external and internal environments.

According to Ahmad (2015) and Peerzadah et al. (2018), GHRM is becoming more popular in today's corporate world as 'going green' and adopting sustainable practices are important parts of organizational policies. Human resource

management's impact on businesses and employees is a growing field of study, particularly in developing nations (Yong et al., 2019, 2020). The development of environmentally conscious habits among workers is one way in which GHRM helps businesses meet their green performance goals. Therefore, the alternative hypothesis H2 is proposed as per the literature review given above:

Hypothesis 2: Employee green behavior is positively related to green human resource management.

2.4. Green transformational leadership and sustainable performance

Aspects of transformational leadership include goals and vision, organizational structure and culture, intellectual stimulation, coaching and mentoring, and performance-based compensation (Bazo and Luyten, 2019). Transformational leaders inspire their followers to work both together and independently to achieve the organization's objectives. According to Waldman and Bass (1991), transformational leaders encourage creativity by taking these steps, which in turn motivate team members to approach problems in new ways.

Sustainability in the construction sector is positively and subtly affected by managers' evaluations of their firms, according to research by Chang et al. (2018). Likewise, GTL entails using knowledge and tools to control building sustainability, which is critical for protecting both human health and the planet's natural resource base (Esmaeel and Sukati, 2015; Shahab et al., 2020). As a result, corporate performance reviews are starting to include non-financial metrics such as social and environmental impacts (Malik et al., 2020).

Similarly, due to increased environmental regulations, scarce human and natural resources, and ever-changing competition, relying solely on financial indicators as performance metrics has become insufficient (Xian, 2015). Hence, alongside traditional financial and economic indicators of productivity and profitability, businesses face increasing demands to integrate sustainable performance metrics, such as measures of stakeholder satisfaction and environmental awareness (Zarte, 2019). Therefore, the alternative hypothesis H3 is proposed based on the literature review given above:

Hypothesis 3: Green transformational leadership is positively related to sustainable performance.

2.5. Green human resource management and sustainable performance

Green Human Resource Management (GHRM) integrates environmentally sustainable management techniques into human resource management while fostering environmental awareness among employees (Renwick et al., 2013). Furthermore, GHRM acts as a framework for nurturing environmentally conscious employees, benefiting businesses, communities, and individuals alike (Arulrajah and Opatha, 2014). The implementation of environmentally friendly policies, practices, and strategies across various facets of human resource management characterizes GHRM, as discussed by Rani and Mishra (2014) and Ojo et al. (2022).

Sustainability as a concept has gained traction in recent years, welcoming many interpretations from various domains. A company's "sustainability" may be defined

as its performance in relation to the economy, society, and the environment (Seo and Cho, 2020). Aiming to maximize earnings, promote corporate performance, build social harmony, and maintain the natural environment are all important goals for commercial organizations, according to previous studies (Seo and Cho, 2020; Tsalis et al., 2020).

In light of the increasing attention on sustainable development, businesses are urged to adopt a strategic approach that elucidates how their operations contribute positively to the environment and communities. This strategic thinking entails articulating the ways in which business activities support environmental preservation and community well-being (Erkmen et al., 2020; Mangla et al., 2020). According to Henri and Journeault (2008), economic, environmental, and social responsibility over the long term are all aspects of sustainability that a company must take into account while it works to achieve its short-term goals and increase shareholder value. Therefore, the alternative hypothesis H4 is proposed as per the literature review given above:

Hypothesis 4: Green human resource management is positively related to sustainable performance.

2.6. Emerging gaps

Table 1 "Summary of key developments and emerging gaps" serves as an analytical summary that highlights the significant advances and identifies gaps within the fields of Green Transformational Leadership (GTL), Green Human Resource Management (GHRM), Sustainable Performance, and Employee Green Behavior. In terms of GTL, research like that of Robertson and Barling (2013) underscores its effectiveness in enhancing organizational sustainability by fostering a culture that motivates and engages employees in green practices. However, there remains a scarcity of studies examining GTL's long-term effects on organizational outcomes such as financial performance and employee retention across different industries. For GHRM, studies like Renwick et al. (2012) demonstrate that eco-friendly recruitment and training are crucial for building sustainable organizations, yet the integration of GHRM with modern digital tools and its effectiveness in diverse cultural contexts remain underexplored. In the realm of Sustainable Performance, the work of Dyllick and Hockerts (2002) links sustainability practices with improved corporate reputation and stakeholder satisfaction, but more research is needed to directly connect these practices to concrete financial metrics in volatile markets. Lastly, regarding Employee Green Behavior, while Ones and Dilchert (2012) have shown the importance of employee participation in sustainability initiatives for achieving environmental goals, there is a lack of understanding on how these individual behaviors lead to broader systemic changes, especially in non-office environments. This table is instrumental in setting the stage for this study, illustrating both where the current research stands and where gaps exist that this work aims to address, thereby justifying the necessity and relevance of the proposed research within the academic discourse on organizational sustainability.

Table 1. Summary of key developments and emerging gaps.

Theory/Development	Key findings	Authors	Identified gaps
Green Transformational Leadership (GTL)	GTL has been shown to influence employee engagement and foster a culture of sustainability within organizations.	Robertson and Barling (2013)	Research is needed on GTL's long-term impacts on financial performance and employee retention in diverse sectors.
Green Human Resource Management (GHRM)	GHRM practices such as eco-friendly recruitment and training positively impact organizational sustainability outcomes.	Renwick et al. (2012)	Limited research on the integration of GHRM with digital HR tools and technologies; effectiveness in emerging economies is underexplored.
Sustainable Performance	Sustainable practices are linked to improved corporate reputation and stakeholder satisfaction.	Dyllick and Hockerts (2002)	Few studies have explored the direct relationship between sustainable practices and market performance metrics in volatile markets.
Employee Green Behavior (EGB)	Employee participation in sustainability initiatives is critical for achieving corporate environmental goals.	Ones and Dilchert (2012)	The influence of individual behavior on systemic sustainability changes remains poorly understood, especially in non-office environments.

2.7. Theoretical framework

Examining how GHRM, GTL, and EGB affect sustainable performance is the aim for this study. **Figure 1** shows the research framework.

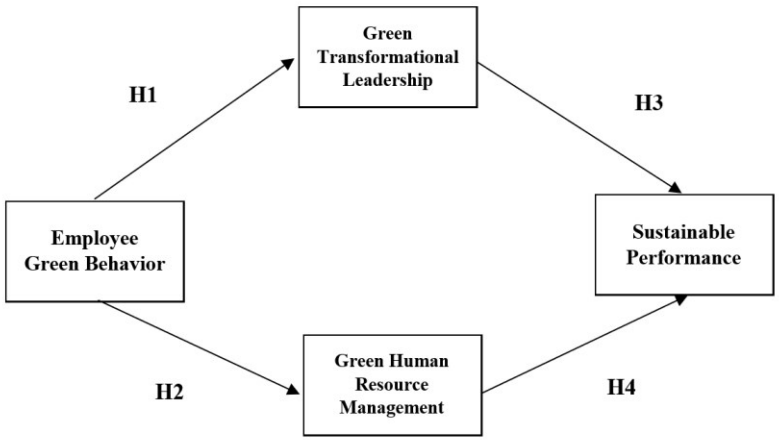

Figure 1. Research framework.

3. Methodology

To advance the research, quantifiable data was systematically collected. The target population comprised managers and owners within the Department of Environmental Quality Promotion, part of Thailand's Ministry of Natural Resources and Environment. This department was chosen due to its pivotal role in promoting environmental quality, making it an ideal context for studying green transformational leadership and green human resource management practices.

3.1. Sampling technique and data collection timeframe

The sampling technique employed was stratified random sampling to ensure representativeness across different managerial roles within the department. This technique was chosen to reduce sampling bias and to enhance the accuracy of the study findings. Data was collected over a three-month period, from January to March 2022,

ensuring that all responses were relevant to current organizational practices regarding environmental sustainability.

3.2. Data collection process

The total target population for the study comprised approximately 150 managers and owners, selected based on their involvement in environmental quality promotion. We initially disseminated 501 survey questionnaires using two main methods: email distribution and in-person (self-administered) delivery during scheduled meetings and workshops.

Email Distribution: 300 questionnaires were sent via email, and 290 were completed and returned, resulting in a response rate of 96.67%.

In-person Distribution: 201 questionnaires were distributed during meetings and workshops, of which 192 were completed and returned, giving a response rate of 95.52%.

The combined response rate from both methods was exceptionally high at 99.17%, indicating a strong engagement level from the respondents. The high response rate also contributes to the robustness of the study's findings.

3.3. Control variables

Control factors such as the age and size of the company were included in the analysis. The size of a firm was assessed using the natural logarithm of its staff count, a method consistent with prior research (Cardinal, 2001). Firm age was calculated as 2022 minus the year of the company's founding, following the approach outlined by Sorensen and Stuart (2000). Hypothesis testing employed ordinary least squares (OLS) regression analysis to examine the relationships hypothesized in the study.

4. Findings

4.1. The measurement model

A set of twenty questions was used to assess many aspects of green leadership, including sustainable performance, GHRM, and EGB. Contributions to creation these item variables came from both (Dumont et al., 2017; Tang et al., 2018). The survey used Likert scale with five points.

4.1.1. Data analysis and findings

The statistical analysis of the collected data was conducted using SPSS for Windows software, version 25.0, as recommended by Hair et al. (2018). This software is widely recognized for its robust analytical capabilities, particularly in handling complex datasets commonly encountered in management and environmental studies.

For this research, the specific technique employed was multiple regression analysis. This statistical method was chosen to explore the relationships between independent variables and how they impact the dependent variables under study. Multiple regression allows for the examination of direct effects of several independent variables (e.g., green transformational leadership and green human resource management) on a dependent variable (e.g., sustainable performance).

The use of Process 25.0, an add-on module for SPSS developed by Hayes,

facilitated the analysis. This tool is useful for examining relationships within regression frameworks, providing a clear, interpretable output that indicates how changes in predictor variables are related to changes in response variables.

4.1.2. Validity test and reliability test

To determine if the scales based on the conceptual model's stated constructs were valid, this research used factor analysis. The original intent of factor analysis was to try to reduce a huge number of elements to a manageable number of components. According to Nunnally and Berstein (1994), Every one of the factor loadings above the generally accepted threshold of 0.40, indicating statistical significance. Using Cronbach's alpha coefficient, we further evaluated the measurement reliability. All of the scales demonstrated a high degree of reliability with Cronbach's alpha values over 0.70, in accordance with Nunnally and Berstein (1994). We can go on to evaluating them now that we know all measures were consistent according to the findings. **Table 2** includes the findings, factor loadings, and Cronbach's alpha coefficients for the multiple item scales used in this study. Factor loading values ranging from 0.775 to 0.948 were recorded for each variable in **Table 2**. Not only that, but Cronbach's alpha ranged from 0.875 to 0.939 for all of the variables. As a result, we may confidently proceed with the following analysis thanks to the measurement constructs' validity and reliability.

Table 2. The measurement model.

Item	Factor loading	Cronbach alpha
Employee Green Behavior (EGB)	0.862–0.880	0.911
Green Transformational Leadership (GTL)	0.843–0.935	0.938
Green Human Resource Management (GHRM)	0.775–0.847	0.875
Sustainable Performance (SP)	0.782–0.948	0.939

4.2. Results and discussion

Table 3 provides the descriptive statistics and **Table 4** presents the correlation matrix for the variables under investigation. Although the initial analysis suggests no significant multicollinearity, a closer examination of the correlation matrix reveals a high correlation between EGB and GTL (0.938), indicating potential multicollinearity issues. This high correlation suggests that these two variables may measure overlapping aspects, which could influence the reliability of the regression model results.

Descriptive statistics such as mean and standard deviation do not directly indicate multicollinearity; they offer basic insights into the central tendency and dispersion of the data. Instead, correlation statistics are essential for identifying potential multicollinearity among variables. Typically, correlation coefficients above 0.80 or below −0.80 might suggest substantial multicollinearity, warranting further investigation.

To conclusively determine the presence of multicollinearity, it would be prudent to calculate the Variance Inflation Factor (VIF) for each variable. A VIF greater than 10 (or even 5, as used by some researchers) would confirm significant multicollinearity, suggesting that adjustments may be necessary, such as removing one

of the highly correlated variables or employing dimensionality reduction techniques like principal component analysis (PCA). This additional step would ensure the reliability of the results by clarifying the extent to which multicollinearity might affect the interpretations drawn from the regression analysis.

Table 3. Descriptive statistics.

Variable	Mean	S.D (Standard Deviation)
EGB	3.997	0.712
GTL	4.005	0.727
GHRM	4.005	0.673
SP	4.018	0.729

Table 4. Correlation matrix.

	EGB	GTL	GHRM	SP
EGB	1	-	-	-
GTL	0.938	1	-	-
GHRM	0.214	0.205	1	-
SP	0.481	0.549	0.260	1

The regression analyses results are condensed in **Tables 5–8**, demonstrating the relationships between various factors in the context of green GTL, GHRM, and sustainable performance:

Table 5. Regression analysis for EGB and GTL support.

DV	IVs	*β*-value	*P*-value
Green Transformational Leadership	Constant	0.161**	(0.074)
	Employee Green Behavior	0.957***	(0.016)
Adjusted R^2		0.882	

Note: **: $p < 0.01$, means significance level indicating statistical significance at 1%; ***: $p < 0.001$, means significance level indicating statistical significance at 0.1%.

The Ordinary Least Squares (OLS) regression analysis indicates a significant positive association between employee green behavior and green transformational leadership support ($\beta = 0.957$, P-value < 0.01), thereby confirming Hypothesis 1.

Table 6. Regression analysis for EGP and GHRM.

DV	IVs	*β*-value	*P*-value
Green Human Resource Management	Constant	3.165***	(0.195)
	Employee Green Behavior	0.201***	(0.042)
Adjusted R^2		0.041	

Note: **: $p < 0.01$, means significance level indicating statistical significance at 1%; ***: $p < 0.001$, means significance level indicating statistical significance at 0.1%.

The results expose a significant positive correlation between employee green behavior and GHRM support ($\beta = 0.201$, P-value < 0.01), supporting Hypothesis 2.

Table 7. Regression analysis for GTL and sustainable performance support.

DV	IVs	*β*-value	*P*-value
Sustainable Performance	Constant	1.857***	(0.178)
	Green Transformational Leadership	0.551***	(0.038)
Adjusted R^2		0.297	

Note: **: $p < 0.01$, means significance level indicating statistical significance at 1%; ***: $p < 0.001$, means significance level indicating statistical significance at 0.1%.

The results show that GTL is positively correlated with sustainable performance support. ($\beta = 0.551$, P-value < 0.01), affirming Hypothesis 3.

Table 8. Regression analysis for GHRM and sustainable performance support.

DV	IVs	*β*-value	*P*-value
Sustainable Performance	Constant	2.867***	(0.221)
	Green Human Resource Management	0.280***	(0.048)
Adjusted R^2		0.062	

Note: **: $p < 0.01$, means significance level indicating statistical significance at 1%; ***: $p < 0.001$, means significance level indicating statistical significance at 0.1%.

The results confirm Hypothesis 4, which states that there is a strong positive correlation between GHRM and sustainable performance support ($\beta = 0.280$, P-value < 0.01). These regression analyses provide empirical evidence supporting the relationships proposed in the hypotheses, thereby contributing to the understanding of the interplay between employee behaviour, leadership styles, HRM practices, and sustainable performance within organizations.

5. Conclusions and discussions

The Department of Environmental Quality Promotion in Thailand has bestowed excellent, very good, and outstanding green office awards to environmentally conscious employees, as demonstrated by green transformational leadership and green human resource management practices that include sustainable performance. In the first part, the positive relationship between employee green behavior and green transformational leadership was analyzed. Heightened environmental awareness has spurred pro-environmental behavior among employees, leading to what is termed employee green behavior, which aims to bolster firms' operations. This increased emphasis on environmental protection has prompted management to ensure employees exhibit green behavior, thereby enhancing firm performance. Employees' efforts to reduce their environmental impact are positively correlated with GTL. When employees act sustainably, it boosts morale, encouraging businesses to develop more environmentally friendly products. Firms' sustainable performance is significantly enhanced by these green efforts, motivating staff to follow sustainability criteria. Consequently, employees' efforts to reduce their environmental impact are strongly correlated with their companies' sustainability policies. This, in turn, encourages workers to develop and use new skills, boosting productivity and long-term viability (Morgan and Rayner, 2019).

Given the growing concern for the environment, businesses are making environmental protection a top priority, highlighting the need to evaluate how sustainability affects GHRM (Cherrafi et al., 2018). In light of the increasing number of green initiatives worldwide, organizations aim to enhance their socio-environmental performance through green transformational leadership techniques. Green business practices reduce waste, which in turn encourages eco-conscious actions from workers and long-term success for the company (Shahid et al., 2020).

Companies rely heavily on GHRM and green transformational leadership to help them expand. By adopting environmentally friendly innovations, companies can take advantage of opportunities to improve their operations, thanks to the increasing credibility of green behavior among employees (Lukitaruna and Sedianingsih, 2018). Businesses have taken a stand for environmental sustainability by encouraging environmentally conscious actions among their staff. Using these measures, they have overcome socio-environmental obstacles, strengthening their long-term performance (Baah et al., 2020). Green corporate activities are critical to addressing emerging environmental problems and achieving better ecological outcomes; businesses perform better in the long run when employees are required to behave sustainably (Zaid et al., 2018). Environmentally conscientious employees improve their firms' long-term sustainability through increased productivity, according to one study (Mousa and Othman, 2020).

Consequently, this study advocates for managers and business owners to adopt and uphold green strategies to cultivate environmentally conscious practices, which ultimately influence firms' sustainable performance. The research underscores the importance of applying green transformational leadership to contribute to the societal well-being of corporations. In the current era of increasing environmental consciousness, organizations should implement GHRM practices (e.g., employee selection based on specific criteria, environmental management training, and performance assessment and rewards) to promote environmental stewardship. Specifically, the study suggests that integrating green transformational leadership involves deploying resources in the form of skills and techniques to advance sustainability, thereby enhancing firms' sustainable performance.

5.1. Theoretical implications

This research significantly advances several facets of Green Human Resource Management (GHRM) theory, particularly in the context of environmental sustainability within organizations. First, our findings underscore the critical role of green recruiting practices. By demonstrating that recruitment strategies incorporating environmental consciousness and expertise can profoundly influence employee behaviors, this study echoes and extends the current discourse on the strategic integration of sustainability into HR practices, aligning with the principles outlined by Renwick et al. (2012). Second, the necessity for proactive organizational strategies in creating a green workplace environment is highlighted. Our data reveal that such environments not only foster greener employee behaviors but also enhance overall organizational performance, providing a concrete example of the theoretical model proposed by Almarzooqi et al. (2019), which links HRM practices to sustainable

organizational outcomes. Third, the importance of performance evaluation in GHRM is reaffirmed. Our study elaborates on how green performance assessments, which include regular feedback, are essential for cultivating a culture of sustainability. This finding contributes to the literature by demonstrating practical ways in which organizations can implement theory into practice, particularly theories that emphasize continuous improvement and feedback as mechanisms for behavioral change (Paauwe, 2008). Fourth, the impact of recognition and rewards on motivating employees towards green behaviors is significantly supported by our results. The data indicate that when employees perceive their green efforts are valued, their engagement and sustainability behaviors improve. This supports the tenets of Social Exchange Theory, as described by Cropanzano and Mitchell (2005), which suggest that positive reinforcements can enhance employee commitment and loyalty to organizational goals. Fifth, the synergistic effect of employee involvement in sustainability initiatives, particularly when combined with structured green HRM practices such as recruitment and rewards, is detailed. This dual approach not only amplifies the effectiveness of each practice but also fosters a more integrated and systemic adoption of green behaviors across the organization, providing empirical support for the AMO framework (Appelbaum et al., 2000). Sixth, the crucial role of training and development programs in promoting sustainable behaviors is highlighted. By providing employees with the knowledge and skills needed to perform their roles in an environmentally responsible manner, organizations can enhance their overall sustainability performance. This aligns with the findings of Fryxell and Lo (2003), who emphasized the importance of education and training in fostering environmental awareness. Finally, this research introduces and tests a conceptual model that integrates the Ability-Motivation-Opportunity (AMO) framework with Social Identity Theory (SIT) and Self-Affirmation (SA) theory. By doing so, it enriches the GHRM literature and provides a nuanced understanding of how various HRM practices interact to influence employee behavior and organizational outcomes in the context of sustainability.

5.2. Practical implications

The practical implications of this research are clear for managers and policymakers within environmentally focused organizations. Given the demonstrated impact of green HRM on sustainable performance, organizations should consider more targeted investments in HR practices that specifically enhance green skills and environmental awareness among employees. For instance, training programs that focus on sustainability practices can be crucial, as suggested by our findings and supported by the work of Jabbour and de Sousa Jabbour (2016), who highlight the effectiveness of such programs in improving corporate environmental performance. Companies are also encouraged to adopt leadership development programs that embed sustainability into core leadership competencies, effectively preparing leaders to champion environmental initiatives.

5.3. Implications of the research

This study opens several avenues for future research. Firstly, further studies could

explore the long-term impacts of green HRM and transformational leadership on sustainable performance across different industries to generalize the findings. Additionally, research could examine the role of cultural factors in the effectiveness of green HRM practices, as cultural variations may influence the adoption and success of such initiatives. Finally, the interplay between technological advancements and green HRM practices presents a fertile area for exploration, particularly in how technology can enhance or hinder the implementation of green practices within organizations. This suggestion is prompted by the increasing integration of digital tools in management practices.

5.4. Limitations and future research

It is important to keep in mind the study's limitations when interpreting its results. Firstly, the study may have limited generalizability since the conceptual model was only evaluated with managers and company owners from organizations under the Department of Environmental Quality Promotion. Peer groups, familial influence, and overall organizational environmental variables are other potential determinants of employees' eco-friendly actions. Another factor that might impact the relationships being researched is the level of trust and perceived organizational support for the correct implementation of pay and incentive systems.

Because it was difficult to get in touch with managers due to the worldwide pandemic, the sample size is somewhat small. The results would be more convincing if future studies used larger samples. Additionally, when analyzing the results of survey-based research, it is important to keep in mind the inherent social desirability bias. However, as some researchers have proposed, this bias may be reduced by making survey responses anonymous.

Future research might follow several paths proposed by this study. Empirical studies on GHRM are still in the minority compared to qualitative and case-based studies. Possible areas for future research include examining how GHRM differs in industrialized and developing nations. It would also be beneficial to look at how green citizenship actions affect business outcomes. Comparing and contrasting the GHRM policies and procedures of for-profit and non-profit companies could also be instructive.

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