

## Impact of Green Transformational Leadership on Green Work Engagement with Mediating Role of Green Intrinsic Motivation

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*In today's rapidly changing business landscape, the importance of sustainability has obtained exceptional significance. Organizations are increasingly adopting green initiatives that benefit the environment and contribute to long-term success. This study explores the concept of GTL and its impact on GWE among employees. GTL is described by leaders who inspire and motivate employees to engage in sustainable practices. This research proposes a mediation model wherein GIM mediates the relationship between GTL and GWE. While the impact of GTL on sustainability is widely acknowledged, the mechanisms through which it affects GWE remain underexplored. This study addresses this gap by exploring the role of GIM as a mediator. Empirical results support the hypothesized model, demonstrating that GTL is positively associated with GWE and exerts an indirect effect through GIM. The findings underscore the vital role of transformational leaders in encouraging a sense of meaning and purpose in green work, leading to higher levels of GWE. Practical implications suggest that organizations should promote green leadership and instill green motivation among employees to achieve sustainable production. Theoretical contributions include the elucidation of GTL's influence on GWE through GIM, advancing understanding in the context of cleaner production. Limitations and future research directions are discussed, emphasizing the need for longitudinal studies, industry-specific validations, and consideration of cultural factors. By encouraging employees to adopt eco-friendly practices, this study emphasizes the critical role that green transformational leaders play in promoting environmental sustainability within businesses. This helps to clarify the relationship between motivation, leadership, and GWE.*

## 1. Introduction

In today's globalized and environmentally conscious business landscape, the concept of sustainability has become increasingly crucial, and organizations are recognizing the need to foster green initiatives that not only benefit the environment but also contribute to their long-term success (Ashfaq et al., 2024; Ashfaq et al., 2022; Abid et al., 2023; Ilyas et al., 2020; Rank et al., 2022). The legal, social and environmental factors are inspiring the organization to accept and practice the sustainability standards (Ashton et al., 2017; Patwary, 2023) due to climate change, environmental awareness of the people and government are imposing more challenging targets not only to the societies but also to the business as they are the main contributors towards the global decarbonization efforts. Businesses are now pushing for the inclusion of environmental goals in their policies (Chung, 2020).

Creating sustainable business practices will be the duty of every corporation (Contreras & Abid, 2022; Lanzen et al., 2018). Consequently, companies are finding it difficult to engage their workforce in environmental projects. The achievement of fundamental green behavior may not be achieved by adding environmental goals in these tactics, as eco-friendly conduct is a complicated phenomenon (Patwary et al., 2023). In the quickly changing corporate environment of today, organizations are increasingly adopting sustainable practices and green initiatives (Sengers et al., 2019). The main objective is to reduce their environmental impact and gain a competitive advantage. To achieve these goals, leaders play a crucial role in driving the adoption of green practices and motivating employees to actively engage in environmentally friendly behaviors. However, while the roles of green practices and transformational leadership in achieving the vision of sustainability are widely accepted. GTL is an emerging theory with regards to sustainable business management.

While firms strive towards making their operations less damaging to the environment, leaders' involvement in championing green endeavours becomes more critical. GTL, which entails setting an example by the leaders in the organizations to encourage the employees to act in eco-friendly ways has been deemed necessary in enhancing the levels of GWE among employees ((Zhang et al., 2020). In addition, it has been established that employees' voluntary desire to participate in environmentally responsible practices has been referred to as a crucial moderator in this association (Hameed & Jebali, 2020). Researchers have pointed out that previous literature has highlighted the importance of GHM to advance environmental outcomes and employees' green concern (Muhammad et al., 2020).

These studies have laid emphasis on the need for cultivating the green behavioral processes and environmental satisfaction as a way of attaining set organizational objectives. Moreover, based on the tenet of the theory of conservation of resources, employees' green motivational resources can become source of idea generation and employee engagement to result in a better organizational environmental performance (Al Shammre et al., 2023). Therefore, this study posits a moderated mediation model where GIM is envisaged to mediate between the relation of GTL and GWE.

Nevertheless, there are gaps in knowledge regarding the processes by which exactly GTL impacts GWE. Thus, this research intends to fill this gap by exploring the position of GIM as a mediator in the link between GTL and GWE.

The conclusions suggest that due to the potential of inspiration and direction of the employees' green work, transformational leaders may fill the gap in meaningful work, which in turn would enhance the levels of GWE (Awan & Sroufe, 2022). Therefore, in this study, we explored the impact of GTL on GWE, shedding light on how leaders can inspire and motivate employees to vigorously contribute in environmental sustainability efforts within the workplace. Through an in-depth analysis, this research seeks to reveal the potential benefits and challenges associated with GTL, ultimately contributing to a deeper understanding of its impact on GWE.

### **1.1 Research Questions**

Following are the research questions:

1. How does the GTL influence the GWE?
2. How does the GTL influence the GIM?
3. What role does GIM play in mediating the relationship between GTL and GWE?

### **1.2 Significance of the Study**

Climate variability, pollution, and environmental deterioration are major threats to the survival of all living organisms, including humans. In the fields of management and organizational behavior, leadership is an important and well-known term. GTL promotes a sustainable environment among their staff members and companies. For every firm to survive and grow, its employees must be aware of the assistance that their company offers. Thus, it is essential to concentrate on GWE, GIM, and GTL. This study adds to the body of knowledge on GTL by examining the relationship between green theory leadership and GWE (GTL and GWE). Secondly, it considers the mediation of GIM in the relationship between GTL and GWE, which is a first for the author's knowledge. Previous research has demonstrated that a variety of constructs influence employees' behaviors; however, the impact of GIM as a mediator in the association between GTL and GWE is a growing need for eco-friendly societies.

## **2. Literature Review**

### **2.1 Role of Green Transformational Leadership**

GTL is characterized by leaders who can articulate a compelling green vision, intellectually stimulate employees to think about environmental issues, and provide individualized consideration to foster green-oriented behaviors (Li et al., 2020). Studies have shown that GTL indeed impacts employees' GIM, defined as the inherent motivation derived from jobs that are environmentally sustainable (Li et al., 2020). In particular, green transformational leadership can facilitate the reception of environmental sustainability among the employees, with the outcome of gaining the

employees' personal identification with the organizational goals and concerns as well as the tasks and initiatives in the green agenda (Li et al., 2020). In addition, related to employee engagement, green transformational leaders can mobilize initiative for resolving green-related issues, and let the employees try to find creative solutions that support environmental sustainability (Li et al., 2020). Consequently, the employees have intrapersonal motivation to perform green work behaviors and thus have higher GWE, which is the amount of physical, cognitive, and emotional energy that an employee expends to perform environmentally sustainable work.

## **2.2 Green Transformational Leadership and Green Intrinsic Motivation**

GTL, the Leadership style that encompasses ecological consideration and sustainability has been acknowledged as a key determinant of green practices in organizations (Wright & Nyberg, 2017). Earlier literature has argued that this leadership type promotes employee GIM, in other words, a person's self-generated motivation to act sustainably. As per the Conservation of Resources theory (Al Shammre et al., 2023) the green motivation is individuals' personal resources, which foster innovative green performances and better overall environmental outputs.

Thus, GIM is deemed conducive because it captures the interest and desire of the individual towards preserving the environment and can facilitate creativity and innovation concerning the construction of eco-friendly products as well as services (Shammre et al., 2023). Research examining the interaction of GTL and GIM has produced useful findings regarding their impact on utilization of framed solutions for working towards sustainability in the work setting. The works indicated that when employees pay attention to the leader's environment-friendliness, their GIM will tend to be high (Ma & Jiang, 2018).

When the green transformational leaders articulate the purpose of the green initiatives and ensure that the employees get to engage in the initiatives at some point, then the employees are motivated to be part of the process because they are meaningfully engaging in the pursuits of environmentalism. In addition, GTL implies employees' autonomy and competence which are two psychological requirements for motivation promotion in employees (Elkhwesky et al., 2022). The delegation of decision-making authority by leaders, providing resources and support for opportunities to engage in sustainable actions provides individuals with incentives to be motivated towards the achievement of the organizational environmental goals.

Moreover, the relationship between GTL and GIM is mediated by employees perceived environmental competence and self-determination (Chen & Chang, 2014). Leaders who promote a supportive and inclusive work environment, where employees feel valued for their contributions to sustainability efforts, cultivate a sense of competence and efficacy among employees, which in turn, enhances their intrinsic motivation to engage in green behaviors. Drawing from the self-determination theory, this paper examines how green transformational leaders can motivate the employees' for cultivating their GIM (Wati & Koo, 2012).

### ***H1. GTL has a significant, positive impact on GIM***

### 2.3 Green Transformational Leadership and Green Work Engagement

Past literature has shown that transformational leadership plays a significant role in promoting positive attitudes and behaviors in sustainable organizations (Ashfaq et al., 2021; Ilyas et al., 2021). Similarly, extensive research on the relationship between GWE and GTL has provided important insights into the mechanisms behind this relationship. Numerous research studies have indicated a favorable correlation between GTL and the adoption of environmentally friendly practices by employees. According to the study of Dwivedi et al., (2022), for example, workers find it more motivating and trustworthy when their leaders give priority to environmental issues, which encourages them to undertake green projects (Chen & Chang, 2013).

Additionally, the focus that green transformational leaders place on aligning the vision and shared values fosters a sense of organizational identity and dedication to sustainability objectives. Workers who support sustainable practices both within and outside the workplace are more likely to act in ways that benefit the environment and to identify with their company's environmental goal (Stahl et al., 2020). Some research has shown contextual elements that may mitigate the association between GTL and GWE, despite the majority of the findings being favorable. For instance, the degree to which GTL yields observable results in terms of staff involvement in sustainability projects may depend on company culture, industry standards, and individual values (Bocken & Geradts, 2020). Relationship between GWE and GTL Overall, a number of research investigations have shown that work engagement is a noteworthy facilitator (Aboramadan, 2022; Salama, Nor El Deen, Albakhit & Zaki, 2022).

It is often accepted that a work engagement for their profession has a significant role in influencing their level of productivity (Ashfaq et al., 2023; Contreras et al., 2021; Erum et al., 2021; Salama et al., 2022). Numerous academics have investigated the connection between transformational leadership and work engagement. GTL had a significant favorable impact on GWE, according to an empirical study by Gustiah and Nurhayati (2022). An empirical investigation was conducted in Australia with 530 full-time employees to find out how transformational leadership affected their level of engagement at work. The results showed that workers' work engagement was significantly impacted by transformational leadership (Yasin, et al., 2013). The results of the study demonstrated that employees who worked for transformative managers were more enthused, involved, and committed to their work. The findings of Huang et al. (2021), showed that a change in senior management teams' green involvement was significantly benefited by CEOs' GTL. Similar to the correlation between GTL and employees' environmental performance, only a small body of empirical research examines the connection between GTL and employee engagement within the hotel sector.

Therefore, drawing from the results of previous studies conducted in business contexts other than hospitality, we attempt to examine the effect of GTL on work engagement. In this context, we hypothesize that green transformative leaders—those that inspire and motivate their

followers to achieve environmental goals—may significantly boost and promote employees' participation in green work. As a result, the following hypothesis is examined.

### ***H2. GTL and GWE has a positive and significant relationship***

#### **2.4 Green Intrinsic Motivation and Green Work Engagement**

GIM, is the extent to which employees are cognitively, emotionally, and behaviorally invested in their organization's environmental goals and initiatives (Wright & Nyberg, 2017). Lins, Servaes and Tamayo (2017) have stated that environmental activities are elaborated by engaged personnel, and these personnel sustain extra efforts even in case of providing a variety of obstacles. GHRM has been considered as the set of strategies that include green recruitment, green training, and green performance management, which contribute to the green intrinsic motivation and green work engagement of employees. through the enhancement of green competencies, offering tasks/assignments involving environmental issues and encouraging workers to participate in environmental activities, organizations can create a pool of employee's who have embraced environmentalism and are willing to practice it within their workplaces. On the other hand, GIM stands for the measure of psychological attachment that employees embrace for the organizational environmental aims and processes of their organization (Wright & Nyberg, 2017).

Engaged employees are more likely to go extra mile and push through the difficulties to be environment friendly (Lins et al., 2017). The findings of different researchers have established the fact that GWE and GIM of the employees can be boosted with the application of GHRM strategies like the green performance management, training, and recruitment practices among others. Companies might develop a workforce which is engaged and self-motivated to contribute to the development of employees' green skills, offering them a chance to contribute to sustainability activities and making them willing to do so. Thus, the authors reasonably assume that those employees who are intrinsically motivated to be green are more involved in green work.

### ***H3. There is a positive relation between GIM and GWE***

#### **2.5 Mediating role of Green Intrinsic Motivation**

Given that GWE is the measure of an employee's physical, cognitive, and emotional investment in their work related to sustainability, this leads to a higher possibility of employees being intrinsically motivated to engage in green work behaviors (Zara et al., 2022). This is a positive result for organizations that has the goal of promoting environmental sustainability. Organization's employees who have personal interests in participating clean up exercises or those who innately support environmentally sustainable activities would be more committed toward their work, demonstrate higher vigor/commitment, and would seek ways on how they could contribute to environmental sustainability (Onjewu et al., 2023).

Green transformational leaders should encourage employees' sense for contributing to green causes within the organization and target GWE, benefiting from the mediating effect of GIM.

Previous researches have revealed that positive changes with reference to the environment involve the adoption of transformational leadership styles by companies. Such styles are defined by visionary communication, providing direction, intellectual challenge, and employee inspiration (Huang et al., 2021; Li et al., 2020). GIM may be the important mediator that would mediate the relationship of GTL and GWE. The term GIM is an abbreviation for green identity motivation and it means an individual's drive to engage in a number of green activities due to an interest in a certain task or an environmental knowledge and/or an interest in the support for sustainability (Hu et al., 2022).

By integrating corporate objectives with personal environmental values, offering intellectual stimulation, and fostering a feeling of direction and significance in green work, green transformational leaders can cultivate GIM in their followers (Bray, 2021). According to the literature currently in publication, employees who are intrinsically motivated to support environmental sustainability are more likely to actively participate in green initiatives and display behaviors that align with the organization's green goals. This suggests that GIM is a key factor in promoting GWE (Li et al., 2020; Hu et al., 2022). Considering this, the authors assume that when companies implement GTL, it improves employees' GIM, which in turn improves employees' GWE.

#### ***H4. GTL mediates the relationship between GTL and GWE***

### **3. Methodology**

The data was supplied by workers from the manufacturing and service companies. The data was then assessed using PLS-SEM. Here, the dependability of the indicators was used to analyze the measurement model. The internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR). The convergent validity was assessed using the Fornell-Larcker criteria. The validity of the structural model has been evaluated using the path coefficients, T value, confidence interval, and beta value. Once the model was validated, the analysis and results of the hypothesis testing were also made available.

#### **3.1 Data Collection Instrument**

Self-administrative questionnaire was modified by the prior researchers, who also employed quantitative and deductive methodologies. The constructs being studied were measured using trustworthy scales.

#### **3.2 Data collection and Sampling**

Both a printed version and a Google form were created for the survey. In order to get the data, the researcher also pay a visit the various businesses in-person visits. With every questionnaire was a cover letter detailing the purpose of the study and the procedures for maintaining participant confidentiality. After removing any incomplete or invalid responses, 302 surveys were chosen from the 500 that were received, and the statistics were gathered using a

convenience sample method. The Structural Equation Model (SEM) calculator developed by Thakkar, (2020) was used to determine the minimum sample size needed to detect an expected medium effect size (0.25) with a desired statistical power of 0.85 for seven latent variables and thirty observed items at a significance level of 0.05%. The guidelines outlined by Westland (2010) were followed in this process.

### 3.3 Measurements

The Likert scale used to rate the study's constructs ranged from 1 to 5, with 1 denoting strongly disagree and 5 denoting strongly agree. Six-item scale that was modified from a previous study by Chen & Chang (2013) was used to evaluate the GTL. A six-item Aboramdan-adapted scale was used to assess the GWE (2020). Ali, Ashfaq, Begum, and Ali (2020) developed a three-item scale to assess the intrinsic motivation for going green.

## 4. Data Analysis

### 4.1 Details of the Participant

Table 1, shows the detail of the respondents. The majority of the participants were male 68.2%, 292 respondents have 14 years' qualification or higher, 51.3% of the participants have experience 0-5 years while 48.7% have experience more than five years. Age, education level, experience, gender, and marital status are all taken into account in this study. These control variables might have an effect on the relationship between GTL, GIM, and GWE.

**Table No 1: Distribution of Employees by Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	206	68.2	68.2	68.2
	Female	96	31.8	31.8	100.0
<b>Total</b>		<b>302</b>	<b>100.0</b>	<b>100.0</b>	

**Table No 2: Distribution of Employees by Education (in yrs)**

Years of education	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10	1	0.3	0.3
	12	9	3.0	3.4
	14	68	22.5	26.3
	15	1	0.3	26.6





	16	94	31.1	31.6	58.2
	17	5	1.7	1.7	59.9
	18	112	37.1	37.7	97.6
	21	7	2.3	2.4	100.0
	Total	297	98.3	100.0	
Missing	System	5	1.7		
Total		302	100.0		

#### 4.2 Measurement Model

For frequency analysis, descriptive statistics, and correlation analysis, we used IBM SPSS (version 24), due to the nested nature of our data, we employ PLS-SEM (variance-based SEM) version 3 to examine our research model. It is regarded as the "all-inclusive and universal instrument." It is well known and regarded as the most dependable statistical analysis program in the field of organizational research (Elahi et al., 2020). The reliability and validity results are given in Table 4.3. According to Hair et al.'s recommended criterion (2023) CR values must be equal to or more than 0.7.

All of the constructs' internal consistency is acceptable because it is over the 0.70 threshold. For GTL, GIM, and GWE, the average variance extracted values are 0.666, 0.751, and 0.632, respectively. They exhibit high convergent validity (CV), with values above the 0.5 threshold requirement (Hair et al., 2023) and all constructs' discriminant validity should be below 0.9, as per the standard requirement of HTMT values in the current study (Joseph F, Hair et al., 2013). The discriminant validity (DV) has been predicted using the Fornell-Larcker standard (Table 4.4).

**Table No 3: Results of Reliability and Validity**

Variable	Alpha	Rho_A	CR	AVE
GTL		0.902	0.923	0.666
GIM		0.834	0.900	0.751
GWE		0.885	0.901	0.632

**Table No 4: Results of Discriminant Validity**

Variables	GIM	GTL	GWE
GIM	0.573		
GTL	.0528	0.566	
GWE	0.467	0.716	0.559



### 4.3 Structural Equation Modeling

According to Biddle and Berlinger (2008), education research has shown that identifying and characterizing the connections among an individual, their social and political context, and interventions is the "hardest science". Multivariate statistical tools that predict one or more outcomes in several ways (e.g., mediation) are used in the interpretation of these dynamic interactions. For these reasons, dynamic sequential interactions between various analytic variables have been described using structural equation model analyses in the field of life-science education research ((Rasheed, San, & Kvamsdal, 2020). Structural equation modeling (SEM) can be used in computer simulations to assess various mediated routes, for instance (Williams and MacKinnon, 2008). To evaluate the hypothesis, structural equation modeling is employed. To test the hypothesis, the researchers employed simple regression. According to the results, GTL significantly affects GWE ( $\beta=0.155, p=0.009$ ).

**Table No 5: Direct Effect of GTL on GWE**

Path		Estimates	P-Value
GTL	GWE	0.155	0.009
GTL	GIM	0.566	0.000
GIM	GWE	0.362	0.000

Abbreviation: “Green Transformational Leadership= GTL, Green Work Engagement= GWE, Green Intrinsic Motivation=GIM”

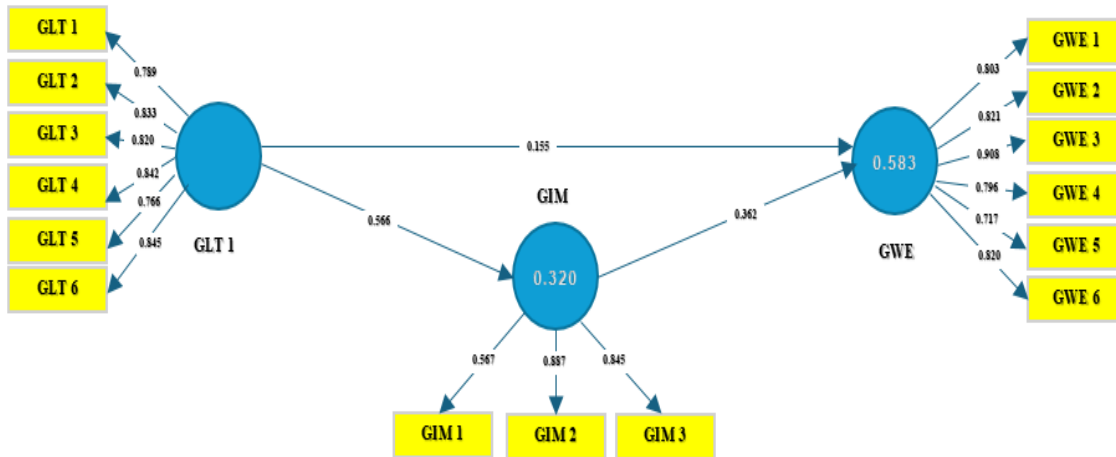
### 4.4 Mediation Test

We bootstrapped the meditation to verify it. Using this method, a large number of new samples are generated from the data by selecting cases at random and replacing them (each case may appear more than once in a sample). Table 4 indicates that GTL had a statistically significant and favorable indirect effect on the GWE through the GIM ( $\beta = 0.205, t\text{-value} = 4.894, p < 0.000$ ). Thus, we agree with H3.

**Table No 6: Indirect Effect of GTL on GWE**

Path	Estimates	T Statistics	P value
GTL-> GIM-> GWE	0.205	4.894	0.000

Figure No 1: Theoretical Framework (Analysis)



### 5.1 Contribution

This study contributes to our understanding of the literature on green transformational leadership and the significant implications of GIM between GWE and GTL. GTL encourages and supports adherents in achieving the company's environmental objectives through GWE. The research also shows that GTL drives GIM, which in turn activates GWE. Our hypothesis that GIM plays a significant role as a mediator between GTL and GWE is further supported by the study. When strategically directed towards GWE, the company will gain from the growth of GIM and the changing role of GTL. The comprehensive results are shown below.

First, the findings show that GTL predicts GWE, indicating that this peculiar leadership style encourages and inspires subordinates to promote GWE by involving them in environmentally friendly behaviors. The study also revealed that GTL significantly and favorably affects GIM. This research suggests that by offering green goals for cleaner production, GTL can increase followers' motivation and passion for environmental safety (Li et al., 2020). Employees thereby internalize these principles, objectives, and goals, which activate ecological intrinsic drive to advance environmental welfare. Third, it is evident from the positive correlation between GIM and GWE that GIM is necessary to induce GWE. This research suggests that people gravitate toward GWE because of their GIM and desire to protect the environment.

Fourth, by examining GIM as a potential mediator that controls the link between GTL and GWE, this study makes another original contribution to the literature on GWE. In other words, GIM serves as a catalyst to translate GTL's influence on promoting GWE in the workplace. In short, the idiosyncratic influence of GTL on GWE increases exponentially when subordinates' GIM is triggered to propose green ideas and techniques, which could be the reason for mediation effects. Thus, the addition of GTL, GIM, and GWE makes the investigation's contribution quite substantial.

## 5.2 Practical Implications

We have seen that, as waste and pollution levels rise, more focus is being placed on greening management practices within the framework of cleaner, greener manufacturing. Our results support the relevance of motivational theories and green leadership, and they imply that GTL and employees' GIM are predictive of GWE, which will encourage environmentally friendly actions. Therefore, an organization and its management should instill green motivation in employees and promote green management philosophy at an organizational level in order to shift production from conventional to efficient, sustainable, and cleaner. Furthermore, study advises that specific actions be made to build green regulations that should be implemented to support the development of green information technology in order to minimize the negative effects that companies and goods have on the environment (Ojo et al., 2019).

## 5.2 Theoretical Implications

Current work provides a numeral theoretical insight. It describes how GTL effects GWE both services and manufacturing industries directly and indirectly through the mediation of GIM. Furthermore, by analyzing the link between GIM and GWE, the current study contributes to the literature on GWE. In doing way, the study contributes to our growing understanding of green motivation in the context of cleaner manufacturing. The study's finding that GIM significantly affects employees' engagement in green work within organizational contexts is another noteworthy contribution.

## 5.3 Limitations and Future Directions

While assessing the findings, it is important to consider the study's limitations. First off, as a survey-based cross-sectional study, the study's methodology is constrained because it may not demonstrate a causal association between the constructs. An experimental or longitudinal design may yield a more complete and in-depth understanding of the relationships. Second, the subject of our inquiry is the manufacturing and service sectors in Pakistan. Future investigations could confirm and analyze the findings of studies carried out in certain industries, especially the automotive sector, which is drastically changing due to the electrification of four-wheelers. Furthermore, in sectors of the economy where green-radical innovation is more prevalent, the metrics of GIM may prove valuable. Third, due to time and resource constraints, cultural considerations were disregarded throughout the study's execution when analyzing the relationship between green leadership structure and GWE; yet, more research conducted in various cultures may yield fresh perspectives and conclusions. Thus, caution should be exercised when generalizing our findings to other cultural and environmental settings. Fourthly, GIM was the only factor taken into account by the study as a mediator between GTL and GWE. Future studies could look into additional mechanisms (such green commitment and green trust) that could have an impact on this relationship. Fifth, the information was gathered through a self-administered

questionnaire, allowing participants to honestly reply based on their personal experiences. Future research may benefit from integrating quantitative and qualitative methods for maybe deeper insights. Lastly, our study only looked at the GTL style; future research should take into account the potential effects of the green transactional and ambidexterity leadership styles on employees' involvement with green work.

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