

Green Transformational Leadership and Workplace Pro-Environmental Behaviour in Hotels: The Mediating Role of Green Organizational Support

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Abstract

One of the growing needs of the hotel industry in this respect is environmental sustainability, which nowadays is heavily reliant on pro-environmental behavior (WPEB) in the everyday workplace of employees, but most hotels fail to translate sustainability intentions into operational-level and regular action. Using the Organizational Support Theory and Social Identity Theory as the theoretical backgrounds, the proposed study focuses on determining whether Green Transformational Leadership (GTL) positively impacts the WPEB of hotels employees and whether a relationship between Green Organizational Support (GOS) and the Green Transformational Leadership (GTL) has any mediating effects in the context of Pakistan hotel industry. The survey design used was quantitative and cross sectional and the sample data were obtained among the employees of three-, four-, and five- star hotels in Pakistan. The measurement model based on PLS-SEM (SmartPLS) was found to be acceptable in both the reliability and validity. The results of the structural model suggested that GTL was a positive predictor of GOS and WPEB and GOS is a positive predictor of WPEB. In addition, GOS plays a major role of mediating the GTL-WPEB relationship which means that green leadership has a direct and indirect effect on employees by encouraging pro-environmental behaviour as it reinforces the perception of employees regarding organizational support of environmental initiatives. The results are useful to hotel managers as they highlight the importance of green supporting transformational leadership and any visible organizational support systems (e.g., green training, green resources, and green recognition) in institutionalizing WPEB and achieve better sustainability results in service-intensive environments.

Keywords: Green transformational leadership; Green organizational support; Workplace pro-

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environmental behavior; Hotel industry; Hospitality sustainability.

1 Introduction

Environmental sustainability is no longer a voluntary corporate duty, but a strategic need, which defines competitiveness, legitimacy, and performance over the long-term, in all industries. Companies are being pressured to have smaller ecological footprints in terms of resource efficiency, waste minimization, and responsible operations not just due to the pressure by the regulations and other stakeholders but also due to the increasing risks on the climate that are impacting the supply chain, infrastructure, and the delivery of services. Tourism and hospitality are quite relevant in this debate since the development in this sector is strongly related to increased energy consumption, food intake and material consumption, as well as waste production. On the macro level, it has been evidenced that the global carbon footprint of tourism is enormous and keeps growing with the growing demand, which implies that carbon reduction efforts in tourism have to step up to follow the decarbonization agenda (Lenzen et al., [2018](#)).

Hotels are a very resource-demanding environment in the tourism context since service provision is based on the constant use of electricity and water, a high frequency of laundry processes, food preparation and food garbage, and extensive consumption of materials in housekeeping and guest services. Modern commentaries on sustainability in the hotel operation emphasize that hotels tend to utilize environmental instruments (e.g., standards, reporting systems, and management systems), yet the usefulness of such instruments is largely determined by the quality of implementation and daily practice among employees instead of policy statements (Makoondlall-Chadee & Bokhoree, [2024](#)). This is particularly applicable to the developing economies where the constraints of operation (e.g. cost pressures, haphazard infrastructure, inadequate training systems) can undermine the process of translating the sustainability policies into the real workplace procedures.

The fact that hotels are people-intensive organizations means that sustainability cannot be realized by merely placing the efficient equipment's, but also by the sustainable behaviors of employees, which can minimize the negative effects they have on the environment (Rassiah et al., [2024](#)). They are theorized as workplace pro-environmental behavior (WPEB) which refers to in-role and extra-role behavior of employees that save resources, minimize wastes, encourage recycling, and advertise green measures in the organization (Robertson & Barling, [2013](#); Wesseling et al., [2017](#)). WPEB is particularly relevant in the service environment (e.g., a hotel) since the aggregate impact of small daily decisions (e.g., saving energy, sorting waste, saving water, eco-suggestions) can have a significant impact on the reduction of environmental impact and contribute to the sustainability results.

The main question thus becomes how hotels can develop WPEB amongst the employees. It is found that again and again leadership is a lever since leaders set priorities, conventions, resource distributions, and cues as to what is rewarded. Nevertheless, a more significant trend in the sustainability-leadership literature is that there is a general shift to environment-specific leadership where the leader openly aligns vision, motivation and guidance with environmental goals. Green Transformational Leadership (GTL) has become one of the best in alignment of ideas with regards to predicting WPEB due to its adaptation of transformational leadership behaviors to environmental objectives with focus on an environmental vision, environmental role modeling, environmental intellectual stimulation and individual support of eco-initiatives (Chen & Chang, [2013](#)). Empirical research in industries indicates that GTL has a beneficial relationship with the pro-environmental behaviors and green results of employees, which in most cases are psychologically and contextually mediated to enhance the motivation and ability of employees to engage in green practices (Ansari & Khan, [2024](#); Farrukh et al., [2022](#); Zacher et al., [2023](#)).

However, the leadership influence on WPEB does not work in a vacuum. The employees must

also feel that the organization appreciates the value of their contribution to green. This is photographed by Green Organizational Support (GOS): perceptions of employees that the organization encourages, recognizes and provides the necessary resources to facilitate environmentally responsible action. Organizational Support Theory (OST) states that organizational support is formed through the perception of the degree to which the organization appreciates the contribution of employees and is concerned about their welfare and that perception affects the reciprocation and extra-role behavior (Rhoades & Eisenberger, 2002; Kurtessis et al., 2017). Applied to the environmental contexts, the scholars develop the same concept with such constructs as perceived organizational support to the environment (POS-E), demonstrating that the environmentally supportive organizations are better placed to induce employees environmental citizenship and pro-environmental workplace behavior (Lamm et al., 2015; Karatepe et al., 2022).

Besides OST, there is Social Identity Theory (SIT) that is also a powerful explanatory framework: workers identify themselves with salient group identities and norms. Once the environmental responsibility is integrated into the combination of who we are as an organization, the employees will be more inclined to implement WPEB to ensure identity continuity and group-affiliation (Fielding & Hornsey, 2016). One way of achieving this process is through GTL by positioning sustainability as a collective mission and justifying pro-environmental standards in hotel work practices.

Despite the increased interest in sustainability and green HRM in the hospitality sector, a clear gap in terms of more mechanism-centered evidence exists on how the environmentally specific leadership can be translated into WPEB of employees, especially in the context of the developing economy hotel sector. It is worth noting that perceived environmental support and pro-environmental behaviors (Karatepe et al., 2022) and various types of workplace pro-environmental behavior in hospitality have already been investigated in addition to leadership-driven pathways, which combine GTL with green support perceptions yet are to be further tested in different contexts. Consequently, this paper examines the question of whether GTL improves WPEB to hotel workers and whether this connection is mediated by GOS, thus providing a theoretically based description of sustainable behavior in the hotel sector in Pakistan.

Although sustainability is an issue that is relevant to the hotel industry, there remains a big gap in defining how the hotels can dependably develop a workplace pro-environmental behavior (WPEB) in their employees. The available research shows that staff WPEB is vital in achieving the environmental performance in service organizations but most problems hotels have is their inability to transform sustainability intentions in day-to-day operations due to time pressure, role overload, and conflicting service demands among the staff. Although the existing literature reviewed organizational policies, green systems and HR practices, there has been less research on the test of the environment-specific leadership as an upstream predictor of WPEB using psychologically significant organizational processes.

Especially, the extent to which Green Transformational Leadership (GTL), a leadership style that is clearly focused on the vision of the environment, motivation, and green role modeling, makes the WPEB stronger by creating the impressions that the organization is committed to the environmental activities of its own is not clear yet (Aboramadan et al., 2022). Because OST postulates that the perception of support determines reciprocations behaviour and SIT postulates that identity based norms determines value consistent behaviour, this paper will cover this gap by testing GOS as a process that directly connects between GTL and WPEB within the hotel industry. The study is relevant in that it has given empirical evidence based on a developing-economy hospitality setting and elucidated how leaders can implement green strategy into employee practice using organizational support perceptions.

2 Literature Review

2.1 Theoretical background: Complementary explanations of OST and SIT

Organizational Support Theory (OST) is the theory that suggests that employees develop universal beliefs on whether the organization appreciates their contribution and is concerned about their well-being, and the beliefs affect attitude, commitment and discretionary behaviors (Rhoades and Eisenberger, 2002). The perceived organizational support is closely related to positive employee outcomes, which is meta-analytic evidence in support of OST, and the perceived organizational support is significant as an example of a behavioral mechanism (Kurtessis et al., 2017). Notably, this reasoning is relevant to the ecological sphere where the research on environmental sustainability considers that employees would be more willing to show WPEB when they believe that the organization is keen in sustaining environmental responsibility with policies, incentives, training, and provision of resources (Lamm et al., 2015; Karatepe et al., 2022).

This is further enhanced by the Social Identity Theory (SIT) which puts emphasis on identity based motivation: when group identity is salient, individuals engage in the behaving such that it can be said to illustrate group norms. The manner in which individuals identify themselves as well as what people of our type typically do may influence their environmental behavior, i.e. workplace pro-environmental behavior can be motivated by identity alignment, normative fit, and group belonging (Fielding & Hornsey, 2016). Leadership clues can be used to establish environmental identity and norms in hotels where work routines and service culture are shared, which are highly likely to result in WPEB.

2.2 Pro-Environmental Behavior at the workplace in the hotel industry (WPEB)

WPEB is the behavior of employees that has a negative impact on environmental damage or facilitates sustainability results at the work place. Some of the ways of covering WPEB in hospitality involve energy and water conservation, food waste, recycling, excessive printing, and suggesting eco improvements. Researchers note that WPEB is essential since the environmental strategy can only be significant when it is practiced by employee actions in their everyday routines (Robertson & Barling, 2013; Wesselink et al., 2017). Recent studies in the field of hospitality also acknowledge that pro-environmental conduct in the workplace may be of various types (e.g., task-related vs proactive) involving not only adherence to green processes but also voluntary eco-actions that are not directly connected to the professional duties of an employee.

2.3 Green Transformational Leadership (GTL)

Green Transformational Leadership is an expansion of transformational leadership theory to the environmental sphere where the influence of leaders is consistent with the sustainability objectives. It entails the expression of an environmental vision, motivation of employees to environmental intent, arousal of green creativity and resolution and encouragement of employee environmental actions. Two streams, used most frequently, include (a) GTL scales, based on the conceptualization of green transformational leadership developed by Chen and Chang (Chen & Chang, 2013), and (b) environment-specific transformational leadership (ESTL) scales applied in the research of pro-environmental behavior in the workplace (Robertson & Barling, 2013). GTL is also shown to predict pro-environmental behaviors, usually with the help of a mediator: green HRM, intention, green engagement, environmental commitment, and environmental knowledge (Ansari and Khan, 2024; Gunay, 2025; Dumont et al., 2017; Farrukh et al., 2022).

In terms of SIT, GTL facilitates the process of building a collective environmental identity through sustainability being a part of organizational meaning (this is who we are as a hotel). Regarding the OST, GTL will affect the behavior via the creation of perceptions that an organization upholds sustainability in terms of resources, recognition and enabling structures.

2.4 Green Organizational Support (GOS)

Green Organizational Support is a reflection of the organizational beliefs of the employees that the organization appreciates their contribution to the environment, enables sustainable work practices, and offers incentives or resources in support of eco-initiatives. The construct has a close relationship with perceived organizational support to the environment (POS-E) that are introduced to sustainability research (Lamm et al., [2015](#)). The perceptions of support are the key factor of hotel since there is a possibility of employees perceiving that green behavior takes extra effort, thus, the organization signals and support systems lower uncertainty and enhance the chance of consistent WPEB. Hospitality evidence demonstrates that the development of perceived organizational support of the environment is linked to greater work engagement and task-related pro-environmental behavior and can decrease undesirable outcomes, including quitting intentions (Karatepe et al., [2022](#)).

2.5 Green Transformational Leadership and Green Organizational Support

GTL will influence GOS since leaders are regarded as decoders of organizational priorities. As leaders share a green vision, devote some time to sustainability, reward environmental behavior of employees, and promote environment-related initiatives, employees can see that the organization appreciates environmental contributions and will back it. This argument is in line with OST since behaviors of the leader form a major source of information that influences perception of support and tendencies towards reciprocity (Rhoades & Eisenberger, [2002](#)). It also goes along with sustainability-leadership studies that show that environmental leadership correlates with higher green climate perceptions and favorable contexts that support pro-environmental behavior (Robertson & Carleton, [2018](#)).

H1: Green transformational leadership (GTL) and green organizational support (GOS) have a positive relationship.

2.6 Green Organizational support and workplace Pro-environmental Behavior

GOS ought to encourage WPEB since support perceptions lower the perceived cost of taking action to protect the environment and enhance the desire to give back by engaging in helpful actions. There is evidence that environmental support predicts environmental citizenship and pro-environmental behavior through the facilitation of employees and an indication of value congruence (Lamm et al., [2015](#); Karatepe et al., [2022](#)). Organizational support in hotel settings may be in the form of training, green SOPs, recycling facilities, feedback mechanism and managerial recognition, which helps in WPEB during business periods of peak services (Kerse, [2024](#)).

H2: Green organizational support (GOS) has a positive relationship with workplace pro-environmental behavior (WPEB).

2.7 Green Transformational Leadership and Pro-Environmental Behavior at Work

GTL will have a direct positive impact on WPEB via role model and motivational pressure. Transformational leadership in an environmental context was found to predict the employee workplace pro-environmental behavior, as leaders are the role models of green values and that they establish a shared norm about sustainability (Robertson & Barling, [2013](#); Mi et al., [2019](#)) furthermore, the sustainability literature demonstrates that the outcome can be influenced by leaders even in situations when employees have different attitudes, as pro-environmental workplace behavior become the prediction of leadership and organizational influence in addition to the psychological factors of intention and perceived behavioral control (Wessellink et al., [2017](#)).

H3: There is a positive relationship between green transformational leadership (GTL) and the workplace pro-environmental behavior (WPEB).

2.8 Intermediate effect of Green Organizational Support

Mediation argument is a combination of both OST and SIT. GTL will be able to establish a friendly

green environment by sending a message that environmental responsibility is important and by justifying eco-initiatives. This reinforces the perceptions of employees regarding support (GOS) and this in turn leads to the implementation of WPEB based on reciprocity and norm congruency. This reasoning is aligned to empirical studies that environmentally oriented support perceptions are useful predictors of workplace pro-environmental results (Lamm et al., 2015; Karatepe et al., 2022) and leadership research demonstrating the effects of environmental leadership on voluntary pro-environmental behaviors in certain situational contexts (Robertson and Carleton, 2018).

H4: Green organizational support (GOS) Mediates the relationship between green transformational leadership (GTL) and workplace pro-environmental behavior (WPEB).

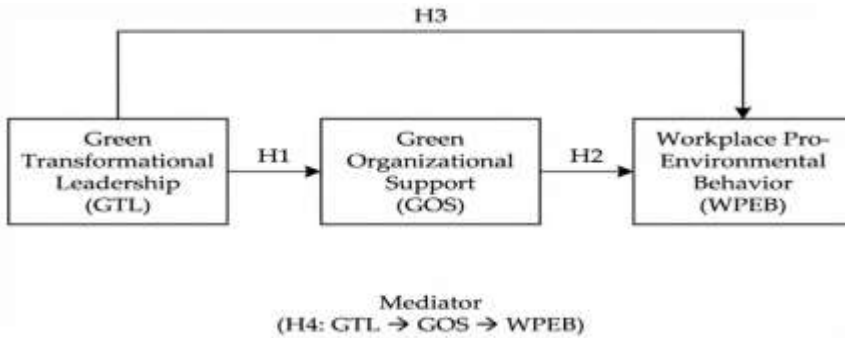


Figure 1: Conceptual Framework

3 Research Methodology

3.1 Research design and setting

A cross-sectional survey design was used in the study as a quantitative design to test the hypothesized relationships between GTL, GOS, and WPEB in the Pakistan hotel industry. In organizational research, the theory testing and explanatory purpose of the study should be using a cross-sectional approach in theory testing and explaining the relationship between latent constructs, especially when the research objective is to use structural modeling to test the patterns of mediation. Nonetheless, as the same time survey design might create common method issues, procedural and statistical solutions were incorporated into the design and analysis phases under methodological recommendations on how to prevent method bias (Podsakoff et al., 2003).

3.2 Sampling and Data Collection Procedures

The targeted employees working in the three-, four-, and five-star hotels in Pakistan were the focus since the formal hotel segment is usually characterised by homogenised service routines and operational systems recorded in documents, which made it an appropriate environment to investigate the leadership-based sustainability behaviours and green working practices in the hospitality sector. The research on hospitality sustainability indicates that hotels have been inclined toward the use of formalized environmental practices and organizational systems to facilitate processes of sustainability, which makes the pro-environmental behavior of employees especially important in this context. The management of the hotels was contacted to seek their consent before data collection and address issues related to anonymity and confidentiality as well as the academic nature of the study, which aligns with the best practices of the procedures that should be safeguarded in conducting research that utilizes surveys (Podsakoff et al., 2003; Hair et al., 2019).

As a result of a lack of a full sampling frame and access limitations common to the hospitality working environment, snowball (chain-referral) sampling was implemented. Chain-referral sampling is a common technique in the situations where the population is hard to reach using

traditional probability techniques and when the response is supported by trusted professional networks and referrals (Biernacki & Waldorf, 1981). In field studies, this strategy is also usually explained by the fact that researchers need to scale up their participation by making initial contacts with qualified respondents in the most effective way (Naderifar et al., 2017). The study has distributed 300 questionnaires (both through in-person and online delivery), and following the process of filtering out the incomplete responses and quality of the response, 200 useful questionnaires were retained, which can be deemed sufficient to estimate PLS-SEM and mediate testing in prediction-based models (Hair et al., 2019; Ramayah et al., 2018).

3.3 Measures and instrument development

Measurement of all constructs was done using already tested scales and measured on a five-point Likert scale of 1 (strongly disagree) to 5 (strongly agree). In order to guarantee the content validity and contextual appropriateness to the hotel environment slight word adjustments were undertaken (e.g., mentioning my supervisor and my hotel) without altering the meaning of items. To decrease the vagueness and pressure of the social desirability, the questionnaire was also checked in regards to clarity and flow.

An existing environmentally oriented transformational leadership scale was used in measuring Green Transformational Leadership (GTL). The pre-existing work makes GTL/ESTL distinctive transformational behaviors, which are specifically aimed at environmental priorities (Robertson & Barling, 2013). The green transformational leadership scale that was created by Chen and Chang (2013) and later modified by other researchers is also often used in empirical research and variations of the six-item method are utilized in other research.

Green Organizational Support (GOS) was assessed as the beliefs of the employees that the organization cares and promotes environmentally responsible practices. This will correlate well with perceived organizational support toward the environment (POS-E), which has been empirically associated with employees being environmentally citizens and associated workplace consequences (Lamm et al., 2015).

The scale used to measure Workplace Pro-Environmental Behavior (WPEB) was the validated workplace pro-environmental behavior scale which describes the environmentally responsible behaviour of employees in organizations. One of the most popular scales in the field is based on the workplace pro-environmental behavior scale by Robertson and Barling that encompasses such behaviors as resource conservation and environmental support (Robertson & Barling, 2013).

3.4 Addressing common method concerns and ethical considerations

Since the self-reported survey measures were used in the study, some measures were done to minimize the risk of the common method bias. Procedural remedies were ensuring anonymity, and that there were no correct or incorrect answers, as well as making items easier to understand, which is in line with suggestions of minimizing method bias (Podsakoff et al., 2003). Common method risk may also be evaluated in the framework of statistical assessment using full collinearity VIF methods that are suggested in PLS-SEM (Kock, 2015). The respondents were informed of the confidentiality and were allowed to do so as participation was on a voluntary basis and their data were to be utilized in the academic research.

3.5 Data analysis strategy

SmartPLS tested the hypotheses with the help of Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is the best approach when the goals of the study are the predictive ones, the models include the mediated relationships, and the research will have very high estimations of the latent constructs measured in a reflective manner (Henseler et al., 2016; Hair et al., 2019; Wong, 2013). The analysis was carried out in two phases of analysis. Firstly, internal consistency reliability was employed to analyze the measurement model as well as

convergent validity. The evaluation of discriminant validity criterion relied on the criterion of high recommendation that must be used when conducting a variance-based SEM because the conventional methodologies may not indicate any discriminant validity problems (Henseler et al., 2015; Sarstedt et al., 2014). Second, the structural model was tested based on the analysis of path coefficients, explained variance (R^2) and effect sizes. Bootstrapping (e.g., 5,000 resamples) was used to test the significance of direct and indirect effects (e.g. 5000 resamples). The reporting was in accordance with the current PLS-SEM reporting standards (Hair et al., 2019; Hair et al., 2021).

4 Results and Findings

4.1 Measurement Model

In line with the two-step theory provided by Anderson and Gerbing (1988), the analysis has evaluated the measurement model (reliability/validity) first, and then the structural model (hypotheses testing). Following common PLS-SEM reporting recommendations, internal consistency reliability was measured with the help of alpha (α), rho A, composite reliability (CR), whereas convergent validity was measured using average variance extracted (AVE).

CR values of all the constructs (as seen in Table 1) were higher than generally accepted values ([?] .70), which implies good internal consistency. Cronbach alpha of WPEB is less (0.561), but this does not necessarily mean that construct is invalid since in certain practice scenarios alpha may underestimate reliability and must be used in conjunction with CR and AVE (Taber, 2018; Peterson, 1994). WPEB has good convergent validity ($AVE = 0.543 > 0.50$) and sufficient CR (0.777) in this dataset, as PLS-SEM recommends that CR/AVE should be important indices of quality (prediction-oriented models in particular).

Three of the indicators of Green Transformational Leadership (GTL6, GTL7, GTL8) were cut because of low loadings, in the practice of standard measurement model refinement in PLS-SEM to enhance the quality of constructs without changing their conceptual meaning. On the whole, the values of Table 1 indicate that the measures have a satisfactory level of reliability and convergent validity.

Table 1. Reliability and Validity Values

Construct	Cronbach's α	rho_A	CR	AVE
GTL	0.873	0.880	0.907	0.662
GOS	0.911	0.925	0.933	0.737
WPEB	0.561	0.578	0.777	0.543

4.2 Coefficient of Determination (R^2)

Endogenous constructs were evaluated in the model by gauging the predictive power with R^2 and adjusted R^2 values. Table 2 indicates that the model can explain 27.3% of the variance in GOS ($R^2 = 0.273$) and 12.8% of the variance in WPEB ($R^2 = 0.128$). The values of R^2 in PLS-SEM are context-specific; however, the high values of GTL show it to have a significant effect on perceived green support (GOS), but WPEB is probably affected by other organizational and job variables besides GTL and GOS (e.g., green HRM systems, work design, infrastructure and operational constraints).

Table 2. Values of R^2 and Adjusted R^2

Endogenous Construct	R^2	Adjusted R^2
GOS	0.273	0.269
WPEB	0.128	0.119

4.3 Discriminant Validity (HTMT)

Discriminant validity was evaluated using the Heterotrait–Monotrait ratio (HTMT). HTMT is widely recommended as a sensitive criterion for discriminant validity in variance-based SEM. As shown in Table 3, all HTMT values are well below recommended thresholds, indicating that GTL, GOS, and WPEB are empirically distinct constructs.

Table 3. HTMT Values

	GTL	GOS
GTL	—	—
GOS	0.568	—
WPEB	0.385	0.472

4.4 Structural Model

Bootstrapping with 5,000 subsamples and bias-corrected confidence intervals (95%) was applied to test the hypotheses and indirect (mediation) effects, as recommended for PLS-SEM inference. Multicollinearity was assessed using VIF. All VIF values (Table 4) fall within acceptable ranges, suggesting that collinearity is not inflating path estimates.

Table 4. Variance Inflation Factor (VIF)

Item	VIF
GTL1	2.094
GTL2	2.261
GTL3	1.878
GTL4	2.003
GTL5	2.050
GOS1	2.459
GOS2	2.163
GOS3	3.580
GOS4	4.013
GOS5	2.736
WPEB4	1.049
WPEB6	1.446
WPEB7	1.411

As shown in Table 5, all the direct paths (H1–H3) and indirect path (H4) are significant with *t*-values above 1.96, *p*-values less than 0.001, and bias corrected confidence intervals which do not contain the value of 0. Notably, since both the direct effect (GTL - WPEB) and indirect effect (GTL - GOS - WPEB) are both significant and both point in the same direction, the trend suggests complementary (partial) mediation, a type of mediation focus in current mediation advice, but not complete mediation (Baron & Kenny, 1986; Zhao et al., 2010).

Table 5. Hypotheses Testing

Path	<i>t</i> -value	BCI LL (2.5%)	BCI UL (97.5%)	<i>p</i> -value
GTL → GOS (H1)	7.178	0.377	0.660	0.000
GTL → WPEB (H3)	4.757	0.207	0.448	0.000
GOS → WPEB (H2)	3.806	0.135	0.415	0.000

Path	t-value	BCI LL (2.5%)	BCI UL (97.5%)	p-value
GTL → GOS → WPEB (H4)	3.509	0.072	0.233	0.000

5 Discussion

This study was aimed at testing the hypothesis, which was to determine whether Green Transformational Leadership (GTL) influences Workplace Pro-Environmental Behavior (WPEB) among employees working in a hotel and whether Green Organizational Support (GOS) intermediates the two. The question is timely as employee green behavior is now increasingly being established as a central micro-foundation of environmentally sustainable organizations and integrative reviews have recently highlighted work-context factors (leadership and organizational support) as some of the most implementable leverages to enhance employee green behavior. Hospitality is a sector in which the service delivery relies on the high frequency daily processes (housekeeping, laundry, food services, engineering) and WPEB is especially consequential since minor resource-conserving interventions would translate to significant sustainable changes.

5.1 GTL → GOS (H1)

The finding empowers H1, which suggests that GTL has a positive correlation with GOS. This result agrees with the existing literature on environmental leadership, which proposes that those leaders who create a green vision, promote eco-initiatives, and serve as role models of sustainability priorities send powerful interpretive signals so as to create the impression that the organization cares about environmental contributions. Regarding support, a group of employees deduce green support not merely through official policies but also through leadership focus and reinforcement in personnel day-to-day activities; hence, GTL becomes a meaning-maker, incumbent to shape sustainability as superiority, compensated, and anticipated. This process aligns with the evidence that leadership and sustainability-focused systems co-determine how employees perceived environmental support and latter green behaviours at the workplace.

5.2 GOS → WPEB (H2)

The findings confirm H2, which indicates that GOS is a good predictor of WPEB. This result agrees with the evidence in the hotel sector that organizational support to the environment perceived enhances task-related pro-environmental behavior and positive results. It is also consistent with the recent research that suggests that pro-environmental support by various organizational sources (organizational/supervisor/coworker/senior leader support) predicts pro-environmental engagement and proactive green behavior (Paillé & Mejía-Morelos, 2019). In practice, green behavior is sometimes perceived by hotel staff as hard (because like sorting waste at busy check-ins), and the cost of being green decreases when assistance is provided, which supports the situation and reduces the perceived cost of acting green, thus transforming intent into a habitual behavior. The results of hospitality and the relevant environments also reveal that the favorable attitude towards environmental activities is closely linked to the green behaviour of the employees via motivational and situational channels (e.g., work engagement, environmental commitment).

5.3 GTL → WPEB (H3)

The findings endorse H3, which proves that GTL is linked with increased WPEB. This is theoretically anticipated since GTL is an environmentally tailored variation of transformational leadership that puts the influence of the leader on the sustainability objectives (inspiring green purpose, stimulating green problem solving, and setting an example as green behavior). The result is also consistent with empirical studies that show that GTL predicts pro-environmental behavior of employees in any context, including those that use SmartPLS based SEM. Of specific interest to your case, some evidence was also found in Pakistan indicating GTL to be a significant

contributor to employee pro-environmental behavior, and it is examined through SEM methods equal to the current study. In addition, the recent scholarship of hospitality still focuses on the importance of organizational and leadership conditions in facilitating employee green behavior and the capacity to create organizational sustainability.

5.4 Mediation of GOS between GTL and WPEB (H4)

The results prove H4, which states that GOS has a great influence in mediating the relationship between GTL and WPEB. This is a type of mediation that can be described as complementary mediation since both the direct and the indirect paths are worth paying attention to and they have a direction. This is substantially an indication of two parallel processes. First, WPEB can be directly influenced by GTL, both with the help of role modeling and motivational power (employees follow the leaders and absorb the green vision). Second, GTL enhances the employee perceptions of green support (GOS) which in itself makes it easier to WPEB because employees are reminded that environmental effort is appreciated and backed and is empowered to act with the help of resources and systems. This trend is in line with the evidence in the hotel industry that perceived green organizational support may serve as a core explanatory factor between environmentally oriented leadership/management systems and green behaviors and work outcomes by employees.

All in all, the findings support one of the driving themes of the employee green behavior literature: environmental sustainability in organizations is not implemented by policy per se, but rather through the behavior of the employees that is influenced by leadership cues and organizational support systems.

5.5 Managerial Implications

The results give practical recommendations to hotel managers that want to enhance WPEB. To start with, developing GTL competencies at the level of supervisors and department heads (housekeeping, F&B, maintenance) is to be considered a top priority by hotels. There has been evidence that GTL is a viable leadership tool towards the enhancement of the employee green outcomes and can work in collaboration with supportive systems to enhance sustainability effects. Second, the managers are supposed to transform the intention of green into green routine by enhancing visible green support; green SOPs, eco-infrastructure (segregated bins, signage, energy-saving defaults), micro-training, and recognition systems. The studies in the hospitality industry reveal that the anticipated organizational support to the environment is anticipated to predict task-based pro-environmental conduct and help in desirable employee results. Third, due to the fact that WPEB is sensitive to the additional contextual factors, hotels can enhance their influence by incorporating the GTL with the green HRM and resource systems that facilitate employee engagement and environmental dedication.

5.6 Limitations and Future Research Suggestions

There are a number of shortcomings to think about. The research is confined to the hotel industry in Pakistan first; the generalizability can be enhanced with cross-country replication, and comparative testing on other conditions of regulation and operation may be made possible. Second, the cross-sectional design restricts causal inferences and can be vulnerable to common method bias; the recommended procedures/statistical remedies should be implemented; time-lagged or multi-source designs should be used in the future research. Third, the explained variance in WPEB is relatively low, implying the presence of other more predictors (green HRM, green engagement, environmental commitment, green work climate, and work design constraints) that gain more popularity in the recent supporting literature on hospitality sustainability. Lastly, boundary conditions including tenure of leader, differences between departments (housekeeping and front office) and the green intensity of job, which could enhance or weaken the GTL - GOS - WPEB mechanism, can also be tested in future research.

5.7 Conclusion

The findings support the assertion that the Green Transformational Leadership (GTL) has positive effects on Green Organizational Support (GOS) and Workplace Pro-Environmental Behavior (WPEB). Also, there is a mediating effect between GTL and WPEB with GOS having a complementary (partial) mediation pattern, which means that GTL facilitates WPEB, both directly and indirectly via improved perceptions of green support. These data points emphasize the importance of the leaders of the hotel proclaiming sustainability and the organization engaging in the images of green practices, since employees are more inclined to practice a regular workplace pro-environmental behavior.

Author Contributions

Muhammad Abdullah Tariq, Muhammad Nazim, Lamarana Balde, and Shazia Khurshid contributed to the study conception and design, methodology, data collection and analysis, interpretation of the results, and preparation and critical revision of the manuscript. All authors read and approved the final manuscript and agreed to be accountable for the work.

Conflict of Interest

The authors declare that they have no financial, commercial, professional, institutional, or personal conflicts of interest related to this article.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to participant confidentiality and applicable ethical requirements.

Informed Consent

Informed consent was obtained from all participants before data collection.

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Use of Generative AI

The authors declare that no generative artificial intelligence tools were used to generate the scholarly content, conduct the data analysis, interpret the findings, or formulate the conclusions presented in this article.

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