



Green Training and Development and Green Employee Empowerment Influencing Employee Green Behavior: The Mediating Role of Employee Green Attitude and Intentions in Lebanese Small and Medium-sized Enterprises

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ABSTRACT

This study investigates how distinct green HR practices, namely green training and development (GTD) and green employee empowerment and participation (GEE), affect employee green behavior (EGB) through attitudes and intentions within Lebanese SMEs. Guided by the AMO framework and the Theory of Planned Behavior, data from 367 employees were analyzed using PLS-SEM. Results indicate that GTD significantly influences employees' attitudes toward green behavior, while GEE does not exhibit a direct effect. Employee attitude strongly predicts behavioral intention, which in turn drives green behavior. Notably, green transformational leadership did not significantly moderate the hypothesized relationships in the full sample; however, multigroup analysis suggests a marginal age-related variation in the empowerment–attitude relationship. The findings underscore the importance of cognitive and deliberate mechanisms in fostering sustainable employee behaviors in resource-constrained environments. Practical implications suggest targeted green training is vital for advancing organizational sustainability.

Keywords: Attitude, Green Training and Development, Employee Green Behavior, Green HRM, Green Behavioral Intention, Green Employee Empowerment and Participation

JEL Classifications: M12, M14, Q56, D91

1. INTRODUCTION

Despite the growing adoption of green human resource management (GHRM), empirical findings remain inconsistent regarding how specific green practices influence employee green behavior, particularly in small and medium-sized enterprises (SMEs). Many prior studies conceptualize GHRM as an aggregated system, which may obscure the distinct psychological mechanisms through which individual practices operate. Addressing this limitation, the present study disaggregates green training and development and green employee empowerment and participation to examine their unique attitudinal and intentional pathways using the AMO framework and the Theory of Planned Behavior.

According to current high-impact evidence, aggregated GHRM systems may not always influence employee attitudes. Indicatively, Fawehinmi et al. (2024) found no significant correlation between the composite GHRM measures and the employee attitudes toward the environmental policy, even though they found indirect relationships between these measures and the perceptions of behavioral control. Weak or even null attitudinal effects have been found in other studies that use bundled GHRM constructs. These results bring about a crucial theoretical issue, namely, when GHRM is considered a system in its own right, particular mechanisms of how individual practices lead to employee-level outcomes might be obscured, resulting in inconclusive or misleading conclusions.

One reason for these inconsistencies is the tendency to view GHRM as a single construct rather than as a collection of diverse practices that operate through different psychological mechanisms. Based on the Ability-Motivation-Opportunity (AMO) framework, the green HR practices are theoretically heterogeneous (Gull and Idrees, 2021; Li et al., 2022; Mehrajunnisa et al., 2021). Green training and development are ability-enhancing practices that are aimed at forming knowledge frames and evaluative beliefs of employees, and green employee empowerment and participation are opportunity-enhancing practices that depend more on the assumed discretion and structural support. Considering the practices as interchangeable can dilute their relevance as attitudes and obscure practice-specific effects (Tay et al., 2017).

Therefore, this paper aims to establish the hypothesis that separating internal GHRM practices will reveal distinct attitudinal and intentional processes through which green training and development, as well as green employee empowerment and participation, positively relate to employee green behavior in small and medium-sized enterprises (SMEs). With these two theoretically different practices, the research evaluates their relationship with the attitude of the employees towards green behavior (ATTGB). Testing these practices independently allows the study to move beyond system-level assumptions and provides a more accurate understanding of how green HR practices translate into positive employee attitudes in the context of resource-constrained organizations.

By focusing on practice-specific psychological mechanisms rather than system-level effects, this study contributes to a more precise understanding of how green HR interventions translate into employee green behavior. The findings emphasize that cognitive and intentional pathways play a more decisive role than structural participation alone, particularly in resource-constrained organizational settings. This approach responds to recent calls for greater theoretical granularity in green HRM research and offers implications for both scholars and practitioners seeking to design effective sustainability-oriented HR practices.

2. LITERATURE REVIEW

2.1. Underlying Theory

The current research is based on the Ability-Motivation-Opportunity (AMO) framework and the Theory of Planned Behavior (TPB), which are complementary theories explaining how organizational green practices are connected with employee green behavior by means of psychological processes within the body.

The AMO conceptual framework understands human resource management practices to impact employee outcomes in three different but interdependent pathways, namely ability, motivation, and opportunity (Appelbaum et al., 2000). Ability-enhancing practices will provide employees with the knowledge and skills needed to carry out certain behavior; motivation-enhancing practices motivate them by rewarding and assessing their actions, and opportunity-enhancing practices afford them discretion, independence, and also a chance to participate in the decision-

making process. Such practices are commonly subsumed as one system-level construct in green human resource management (GHRM) research. Nonetheless, even AMO theory suggests that these practices are functionally dissimilar and can engage various psychological processes.

Specifically, the theorized ability-enhancing practices include green training and development, which are meant to influence the cognitive structure of employees by raising environmental awareness and making behavioral expectations and evaluative beliefs regarding environmental responsibility stronger (Azizie et al., 2025). These are practices that would thus have a greater impact on how the employees consider green behavior. Conversely, opportunity-altering strategies, including green employee empowerment and participation, are mainly based on the perceived discretion and structural facilitation rather than explicit cognitive contribution (Tariq et al., 2016). Whereas empowerment can enable behavioral enactment to be facilitated in certain circumstances, its applicability in enabling attitudinal formation can be less or context-specific, particularly in organizational contexts where participation is informal or symbolic.

This paper will use the Theory of Planned Behavior to explain the psychological processes involved in the operation of these practices. TPB assumes that behavior is mostly preceded by behavioral intention, which is influenced by attitudes toward behavior, perceived behavioral control, and subjective norms (Ajzen, 1991). In this context, attitude refers to an individual's overall evaluation of performing a behavior, while intention represents the immediate precursor to that behavior. Although the Theory of Planned Behavior proposes that attitudes influence behavior primarily through behavioral intention, Ajzen (1991) acknowledges that the attitude-behavior link may operate both directly and indirectly, depending on contextual constraints and model specification. In organizational settings, particularly within SMEs characterized by informal structures and weak enforcement mechanisms, attitudinal activation may exert both intentional and direct behavioral effects. Therefore, the present study tests the TPB components without imposing a strict serial mediation constraint, allowing the attitudinal-intentional-behavioral relationships to emerge empirically rather than structurally predetermined.

TPB has been widely referred to in GHRM studies, but it is only partially operationalized. Attitudes and intentions are typically excluded, combined, or thought of as secondary variables, while GHRM practices are thought to have direct effects on employees' behavior. The recent empirical data confirms this concern by indicating that aggregated GHRM systems often fail to reveal significant relationships with the attitude of employees, indicating that attitudinal activation is conditional upon the experience of specific practices and not on the existence of GHRM in general.

A combination of AMO and TPB will provide the opportunity to explain these patterns in a more accurate way. In this view, GHRM practices will not always produce consistent effects on attitudes or behavior; instead, their impacts will vary in relevance based on employees' cognitive judgments and voluntary preparedness. The ability-enhancing practices are theoretically expected to have

a stronger influence on attitudes, while the opportunity-enhancing practices may follow different or conditional pathways. Attitude and behavioral intention, therefore, are the core mechanisms connecting the chosen green HR practices and the green behavior of the employees. Such an integrated approach will allow this study to go past the system-level assumptions and offer a practice-specific description of how green HR interventions will be translated into the green behavior of employees within small and medium-sized enterprises.

Building on these theoretical foundations, the proposed hypotheses are derived from the combined logic of AMO and TPB. From an AMO perspective, green training and development (GTD) represents an ability-enhancing practice expected to shape employees' evaluative judgments, thereby influencing attitudes toward green behavior (H_{1a}), whereas green employee empowerment and participation (GEE), as an opportunity-enhancing practice, may exert a more conditional or context-dependent influence on attitudes (H_{1b}). In line with TPB, attitudes are theorized to predict behavioral intention (H_2), which in turn predicts employee green behavior (H_3), forming the mediating sequence tested in H_4 – H_6 . By disaggregating GTD and GEE rather than treating GHRM as a single construct, this study addresses prior inconsistencies in the literature and clarifies the distinct psychological mechanisms through which green HR practices operate. Additionally, green transformational leadership is theorized as a boundary condition that may strengthen or condition the influence of green HR practices on employee attitudes (H_{7a} – H_{7b}).

2.2. Hypothesis Development

2.2.1. GTD and ATTGB

Green training and development have a significant role in the formation of environmental awareness, values, and evaluative orientations of the employees towards the behavior of the sustainable workplace. Green training helps to explain the topicality and predictability of the results of environmentally responsible behavior, and behaviors that make it easier to form more positive attitudes towards green behavior (Azizie et al., 2025). In line with the Theory of Planned Behavior, the attitude is determined by the beliefs of the consequences of a behavior and the appraisal of the consequences (Ajzen, 1991).

The previous study shows that training-based GHRM practices stimulate the internalization of environmental values and reinforce the cognitive frames of employees to assess the environmentally responsible conduct (Bangwal et al., 2025). Empirical research also indicates that green training equips employees with the knowledge and skills on the environment to be able to identify the priorities of sustainability and ensure that their work practices align with the environment (Odhiambo et al., 2023). Green training also influences the way employees perceive and judge environmentally responsible behaviors in the workplace due to heightened awareness and knowledge.

On the same note, Aziza et al. (2023) contend that green training helps to improve the awareness that employees have about the practices of sustainability and environmental control,

which subsequently influences their cognitive judgments about environmental responsibility. These studies are not measuring attitude directly, but the findings of such studies are conceptually relevant in that green training as an ability-enhancing practice is part of the evaluative judgments that underlie the attitude of employees to green behavior. In this regard, the hypothesis presented below is offered:

H_{1a} : Green training and development positively influence employee attitude toward green behavior.

2.2.2. GEE and ATTGB

There is a theory that green employee empowerment and green employee participation are successful ways of promoting positive environmental attitudes; nevertheless, empirical evidence demonstrates that this does not work everywhere, but instead in certain situations. According to several studies, empowerment is not always associated with employee attitudes toward green behavior, especially when the environmental tasks are delegated without providing proper training, resources, and organizational support. As an example, Nguyen et al. (2025) established that green employee empowerment undermined the association between green human resource management and voluntary green behavior, indicating that empowerment can induce strain or role overload in poorly endorsed circumstances.

On the other hand, an increasingly accumulated body of evidence confirms the positive influence of empowerment and involvement in the formation of the environmental analysis of employees. Empowerment is found to increase the evaluative orientations of employees towards green behavior due to psychological involvement in environmental initiatives (Ojo and Fauzi, 2020; Veerasamy et al., 2024). Similar evidence in Pakistan, Jordan, and Lebanon also suggests that it makes empowerment mechanisms more efficient to experience participation as autonomy and meaningful instead of imposed (Aloqaily, 2023; Chreif and Farmanesh, 2022; Martins et al., 2025).

Similar to this argument, Aziza et al. (2023) conceptualize green employee empowerment and involvement as the participation of employees in environmental programs, decision-making processes, and accountability for environmental consequences. According to them, this kind of involvement leads to psychological attachment, which leads to the internalization of environmental responsibility by employees and the perception of environmentally responsible activities as being meaningful. The attitude of employees is not directly gauged, but their results show that the perception and understanding of environmental responsibility among employees is mediated by the empowerment and participation, which are fundamental to the evaluative decisions that constitute the foundation of attitude development. Green employee participation and empowerment can be considered as opportunity-creating practices according to an ability-motivation-opportunity perspective since employees can control their autonomy, voice, and involvement in the decision-making process regarding the environment (Jiang et al., 2012; Saeed et al., 2019). These evaluative orientations are considered the key antecedents of the attitudes to environmentally responsible behavior in accordance with the Theory of Planned Behavior (Ajzen, 1991; Renwick

et al., 2013). On this background, the hypothesis stated below is presented:

H_{1b}: Green employee empowerment and participation positively influence employee attitude toward green behavior.

2.2.3. *ATTGB and GBI*

The literature will be consistent and supportive of a positive association between the attitude of employees towards green behavior and green behavioral intention. In the Theory of Planned Behavior (TPB), attitude is one of the determinants of the behavioral intention and is the favorable or unfavorable appraisal of a particular individual to engage in a particular behavior (Ajzen and Fishbein, 1980; Ajzen, 1991). In case employees are willing to assess positively environmentally responsible behavior and feel that its results are advantageous, they will tend to develop intentions to behave in this way (Ajzen, 1991; Ateş, 2020).

The relationship is highly supported by empirical evidence in various contexts. Zhang et al. (2021) indicated that the attitudes developed during the environmental knowledge-sharing processes had a significant impact on the green behavioral intention of Chinese employees, which then transferred to employee green behavior. Likewise, by using an extended TPB framework, Sabri et al. (2022) found that, when applied to the Malaysian public sector, the attitude of employees was a significant predictor of the green behavioral intention and an indirect cause of the green behavior. Katz et al. (2022) conducted a meta-analysis involving 135 independent samples that once again supported the idea that pro-environmental attitudes strongly predict green behavioral intention, which, in turn, positively correlates with green behavior. Khalid et al. (2022) also presented consistent results and confirmed the positive effect of attitude on the green behavioral intention as stipulated by TPB assumptions.

Newer studies are still supporting the attitudinal-intentional correlation. Trivedi et al. (2025) demonstrated that organizational commitment reinforced the pro-environmental attitudes of hotel employees who had a strong desire to adopt green practices, as evidenced by their intention to do so. In a more general social psychological view, Manstead (2001) pointed out that attitudes are a reliable predictor of behavioral intentions; they are contextually consistent, and they are measured at the right degree of specificity. All of these results suggest that positive attitudinal assessments can be viewed as a leading mental tool, which converts organizational and personal values into a premeditated willingness to practice green behavior. Although there is considerable empirical evidence that supports the relationship within a context, there is limited empirical evidence on SMEs in Lebanon, which highlights the importance of investigating the relationship in an organizational context that is resource-constrained. Therefore, the hypothesis is stated as follows:

H₂: Employee attitude towards green behavior positively influences green behavioral intention.

2.2.4. *GBI and EGB*

Studies that have been carried out in similar settings to Lebanon show mixed evidence on the relation between green behavioral intention and green behavior of employees, with some studies

showing that there is an intention-behavior gap. The study by Al Zaidi et al. (2023) on UAE public-sector employees showed that green behavioral intention alone was not enough to predict green behavior unless supported by habitual green practices. These gaps have been reported in a wide variety of areas, such as agricultural practices (Yang et al., 2024), waste recycling (Zhang et al., 2023; Zhou et al., 2023), sustainable consumption (Park and Lin, 2020), and household energy-saving behavior (He et al., 2023), which suggests that the strong intentions do not necessarily translate into action.

Although there is this debate, empirical research has an extensive amount of evidence that shows a strong positive correlation between green behavioral intention and green behavior among employees. As the evidence of many studies reveals, intention is the closest psychological predeterminant of environmentally responsible action that brings goal-oriented green behavior into the context of the organizational environment (Klößner, 2013). Additional evidence provided by meta-analytic and cross-national studies also indicates that green behavioral intention is a strong predictor of employee green behavior in different fields and nations (Katz et al., 2022; Hasebrook et al., 2022; Fawehinmi et al., 2024).

Other studies also focus on intention as the process by which attitudinal, normative, and control-related antecedents are transformed into behavior. Green behavioral intention by Trivedi et al. (2025) and Khalid et al. (2022) has a positive impact on mandatory and voluntary green behavior, which is in line with the fundamental assumptions of the Theory of Planned Behavior. On the same note, Guerra-Lombardi et al. (2025) established that even though contradictions have been occasionally reported in the literature, green behavioral intention is still a strong predictor of employee green behavior. In the view of AMO-TPB, the last psychological step involves the green behavioral intention, wherein organizational practices are converted into actual green behaviors. In this context, the hypothesis is stated as follows:

H₃: Green Behavioral Intention positively influences Employee Green Behavior.

2.2.5. *Mediation of ATTGB between GTD and EGB*

Green training and development (GTD), in an environmental context, provides employees with skills and knowledge necessary to facilitate the organizational environmental management agenda (Daily et al., 2012). Empirical studies continue to reveal that there is a positive association between GTD and employee green behavior because trained employees have a higher level of environmental awareness, ownership, and interest in the activities that are environmentally friendly (Judeh and Khader, 2023; Ramus, 2002; Renwick et al., 2013).

In addition to direct relationships, the literature of the past indicates that the effect of GTD on green behavior takes place through the evaluation orientations of the employees. Environmental training has been associated with a more positive outlook on organizational environmental policies, including pollution prevention and waste management (Aragon-Correa, 1998; Veerasamy et al., 2024). On the Ability-Motivation-Opportunity model, GTD is an ability-enhancing practice, and employee attitude is the psychological

process that transforms knowledge and skills acquired into environmentally responsible behavior. GTD facilitates the internalization of values and the social modeling of developmental aspects of the self-concept of the environment, emphasizing the central role of attitudes in bridging the gap between training and behavior (Tian et al., 2020).

The research also indicates that pro-environmental attitudes are predictors of required and voluntary green behavior and mediate between green leadership and employee green behavior (Nawaz Khan, 2023; Tian et al., 2020). Even though the increase in awareness and motivation is also provided by GTD, attitude is the main cognitive and affective connection between training and behavior in an integrated AMO-TPB view (Fawehinmi et al., 2022). This phenomenon is especially relevant in the Lebanese SMEs, where there is a lack of formal systems in the environment, which increases the importance of internalized attitudes over structural controls (Amini et al., 2024). In this context, the hypothesis is stated as follows:

H_{4a}: Employee attitude toward green behavior positively mediates the influence of green training and development on employee green behavior.

2.2.6. Mediation of ATTGB between GEE and EGB

Green employee empowerment and participation (GEE) by engaging employees in environmental policies and decision-making processes promotes the sense of autonomy, competence, and perceived discretion and could enable employees to internalize environmental values (Daily et al., 2012; Rashid et al., 2023). Empowered employees can develop a higher level of intrinsic motivation and a pro-environmental identity, making empowerment a crucial opportunity-enhancing practice in corporate-level environmental efforts through participation, information sharing, and delegated authority (Lee, 2009; Tariq et al., 2016).

Nonetheless, empowerment is not the only factor that leads to the implementation of green behavior. According to the previous studies, employee attitude towards the environment is an extremely important psychological process by which empowerment is transferred into behavior (Jiang et al., 2012). Employees with positive environmental attitudes will be able to demonstrate green cognition, compliance, and advocacy behavior, but empowerment without positive attitudes will not be fully utilized (Saeed et al., 2019). The Theory of Planned Behavior, which defines attitude as a major cognitive factor that determines whether people develop intentions to engage in and continue taking environmentally supportive behavior, aligns with this rationale (Ajzen, 1991). Favorable attitudes also reinforce the ability of employees to engage actively in green initiatives (Faezah et al., 2022).

In the integrated AMO-TPB view, GEE offers employees a chance to participate in environmental programs, and the attitude of employees is the motivational-cognitive process whereby empowerment can result in behavioral effects (Ramus and Steger, 2000). It has been empirically indicated that the influence of empowerment on sustainable working behavior is

stronger when employees have positive environmental attitudes, and the relationship between empowerment, attitude, and green behavior has a reinforcing effect (Zafar et al., 2025). This process might be especially applicable to the Lebanese SMEs, whereby the hierarchical structure frequently inhibits employee voice, and participatory empowerment could have a significant role in the translation of discretion into significant environmental participation. Based on this, the hypothesis below will be formulated:

H_{4b}: Employee Attitude Toward Green Behavior positively mediates the influence of Green Employee Empowerment and Participation on Employee Green Behavior.

2.2.7. ATTGB and EGB

Although other scholars have cast doubt on the consistent relationship between positive environmental attitudes and their actual green behavior, there is little empirical evidence against the relationship. In their initial work, De Luca and Pegan (2011) hypothesized that employees can have positive green attitudes but fail to act green because of situational constraints. More recently, Miller and Rice (2024) claimed that the attitude-behavior relationship can be undermined by situational and organizational obstacles, especially when the cultural and structural background of environmental action is low.

Despite this controversy, there is a large amount of empirical data that confirms a positive correlation between employee attitude towards green behavior and employee green behavior. The research in the organizational context shows that positive feelings about the environment encourage employees to participate in both task-related and proactive green behaviors (Arshad et al., 2021; Bissing-Olson et al., 2013; Tian et al., 2020; Wesselink et al., 2017). Additional meta-analytic and cross-contextual research confirms that pro-environmental attitudes are sufficiently accurate predictors of employee green behavior, both the mandatory and the voluntary ones (Katz et al., 2022; Khalid et al., 2024). Similar complementary evidence provided by consumer behavior research also sees the environmental attitudes as strong predictors of green action, but also notes that attitude itself does not necessarily result in consistency of behavior (Dhir et al., 2021; Eid et al., 2021).

The most recent studies support the strength of the attitude-behavior relationship and an emphasis on the crucial boundary conditions. Katz et al. (2023) determined that task-related and proactive green behavior are positively predicted by environmental attitudes, and Lathabhavan and Bharti (2024) determined that employee green behavior is mediated by green values. Other findings indicate that favorable leadership and a green psychological climate can reinforce the attitude-behavior translation (Feng et al., 2024). With respect to the Lebanese SMEs, where formal environmental systems are in many ways constrained, employee attitudes toward green behavior can be especially significant in transforming environmental awareness into practical behavior at the workplace. Based on this, the hypothesis is as follows:

H₅: Employee Attitude Towards Green Behavior positively influences Employee Green Behavior

2.2.8. Mediation of GBI between ATTGB and EGB

Even though the Theory of Planned Behavior (TPB) is frequently mentioned in the literature on environmental psychology and green human resource management studies, there are few explicit empirical tests of behavioral intention as an intermediary between attitude and behavior in the workplace setting, and especially in small and medium businesses. Numerous studies will conceptually use TPB but will not treat behavioral intention as a separate construct; instead, they often combine intention and behavior into a single scale, resulting in a lack of alignment between theoretical assertions and empirical operationalization. Consequently, the key sequence of attitudinal, intentional, and behavioral processes that TPB presumes is usually assumed and not tested directly.

Other studies have found other mediating processes, including green organizational culture, affective commitment, or environmental knowledge, which imply that there could be many psychological pathways that work in parallel in organizations (Ahmad et al., 2023; Gomes et al., 2024). The findings do not disprove TPB since only the relative significance of intention might differ in contexts and behavior types. There is, however, strong methodological support for the TPB sequence when using evidence in non-workplace settings. Indicatively, Gkargkavouzi et al. (2019) proved the existence of a strong impact of attitudes on behavioral intention, which, in turn, became the most significant predictor of environmental behavior.

The importance of attitudinal mechanisms in the enactment of behavior is further established by workplace-relevant research, although intention is not directly modeled. Hospitality and nonprofit research indicate that the direct connection between green HRM activities and employee green conduct is mediated by internalized environmental passion, especially when employees have autonomous attitudes instead of externally imposed ones (Perano et al., 2025; Chreif and Farmanesh, 2022). Likewise, studies in small tourism organizations suggest green HRM practices have environmental performance via employee green behaviors, which is also consistent with TPB logic, though behavioral intention is also usually implied but not directly measured (Elshaer et al., 2021).

Behavioral intention, according to TPB, is the direct psychological predictor of behavior, which mediates attitudes and behavior (Ajzen, 1991; Yuriev et al., 2020). The empirical findings always demonstrate that intention is a significant predictor of green behavior and is influenced by attitudes, perceived behavioral control, subjective norms, and environmental knowledge (Ajzen, 1991; Fawehinmi et al., 2024). Green behavioral intention can be of special significance in converting positive attitudes into apparent green behaviors in the context of choosing the Lebanese SMEs, where formal environmental systems and enforcement mechanisms are commonly weak. In this regard, the hypothesis is as follows:

H₆: Green Behavioral Intention positively mediates the influence of Employee Attitude Towards Green Behavior on Employee Green Behavior.

2.2.9. Moderation of GTL between GTD and ATTGB

Green transformational leadership (GTL) refers to leadership activities that may articulate the environmental vision, act as role models in sustainable business conduct within the company and encourage employees to take part in the environmental business operations of the company (Robertson and Barling, 2017). It has also been revealed that environmentally specific transformational leadership can be used to create a favorable green working climate, as it implies the significance of environmental values and can lead to adherence to organizational objectives of sustainability (Robertson, 2018). It can be suitable situational leadership in a hierarchical organizational culture where employees rely on the flows of information disseminated by the leader to know environmental priorities (Peng et al., 2020).

According to the studies, GTL is able to positively influence pro-environmental behavior through promoting environmental goals and innovation and giving environmentally related guidance (Peng et al., 2020). At the same time, green human resource management practices, such as green training and development, can support the environmental behavior and introduce sustainability to the organizational systems and learning processes (Dumont et al., 2016). The growing evidence leads to the assumption that leadership practices and green HRM behaviors may be complementary to each other and that leadership may advance the effectiveness and uniqueness of training messages by modeling sustainable behavior and reinforcing the sustainability-oriented priorities (Peng et al., 2020).

Green transformational leadership, in this perception, can mediate the relationship between green training and development and employee attitude towards green behavior by increasing the consistency and reality of signals of environmental cues regarding training programs. The leaders who demonstrate their dedication to the values of environmental concern will have a higher chance to translate the information in the training into positive employee scores on the practice of green behavior. In that respect, the hypothesis is formulated in the following way:

H_{7a}: Green Transformational Leadership moderates the influence of Green Training and Development on Employee Attitude Toward Green Behavior.

2.2.10. Moderation of GTL between GEE and ATTGB

Some previous studies indicate that leadership actions may contribute to the success of green human resource management practices by shaping the organizational climate, signaling environmental priorities, and facilitating staff participation in sustainability programs. The SMEs' and regional experience evidence indicates that in some circumstances, leadership can make green HRM practices more effective in shaping employee attitudes and behaviors by increasing the level of trust, credibility, and perceived organizational support. Ethical leadership, as an example, heightened the impacts of green HRM on employee green behavior, as demonstrated by Chreif and Farmanesh (2022), due to improved environmental passion and environmental perceived climate, indicating that leadership integrity and value signaling help to prevent the perception of empowerment practices as symbolic. Even though they were not investigating the concept of environmentally specifically oriented leadership but rather

ethically oriented leadership, their results indicate the wider contribution of leadership to the mobilization of attitudinal and behavioral channels related to green HRM practices.

Empirical research also points out that under some conditions, green transformational leadership (GTL) can engage with green HRM practices to emerge as a factor that affects the employee outcomes. Lahbar et al. (2025) established that GTL has provided benefits to environmental performance through green HRM and green innovation, with these effects depending on individual environmental values, which implies that the effectiveness of leadership relies on how well organizational practices align with those of the employees. On the same note, Martins et al. (2025), who were researching employees in the food industry in Pakistan, found that green leadership reinforced the association between green HRM and green empowerment by availing resources, autonomy, and psychological safety. These results suggest that leadership may be a situational factor that determines whether empowerment programs yield positive employee appraisal and participation.

Theoretically, green transformational leadership is an environmentally differentiated version of transformational leadership, which instills sustainability principles in the organizational vision, decision-making, and day-to-day operations (Gumusluoglu and Ilsev, 2009; Azizie et al., 2025). GTL can create a favorable environment to take environmental action by promoting participation, voice, and innovation (Sidney et al., 2022; Saleem et al., 2024). In combination with green practices of employee empowerment and participation, GTL could reinforce environmental cues and enhance the attitudinal alignment of employees with sustainability objectives, especially in hierarchical settings where employee voice is otherwise limited. Based on this information, the following hypothesis is proposed:

H_{7b}: Green Transformational Leadership moderates the influence of Green Employee Empowerment and Participation on Employee Attitude Toward Green Behavior.

The conceptual framework of the study, illustrating the hypothesized relationships among variables, is presented in Figure 1.

3. METHODOLOGY

3.1. Research Design

This research uses a quantitative, cross-sectional research design because it aims to explore the relationships between the chosen green

human resource management practices and the employee attitude towards green behavior, green behavioral intention, and employee green behavior. The survey-based strategy was used because it is suitable in testing theoretically based relationships among the latent psychological and organizational constructs in the natural organizational contexts. The cross-sectional design is applicable in investigating associations between variables as perceived by employees at any one point in time, as is the case in the earlier studies of green human resource management and organizational behavior.

3.2. Research Context and Sample

The context of the study, which is based on empirical data, is small and medium-sized enterprises (SMEs) in Lebanon. SMEs form a theoretically feasible context in which to study employee green behavior because they tend to have weak formal sustainability frameworks, informal human resource systems, and highly discretionary employee behavior. In this regard, the role of attitudes and intentions among employees should be of specific importance in developing environmentally responsible behaviors.

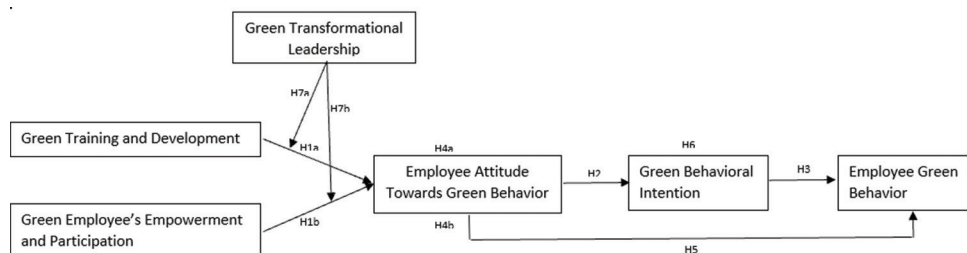
The responses were gathered from employees in various industries, such as services, manufacturing, and trade. The convenience sampling strategy was employed because of the lack of thorough sampling frames of the SMEs and the operational limitations of organizational accessibility. The respondents were voluntary and assured of confidentiality and anonymity to minimize the social desirability bias and induce honest answers. Although convenience sampling may limit the generalizability of the findings, this approach is common in SME research where comprehensive sampling frames are unavailable. The inclusion of respondents from multiple industries and the use of anonymity and voluntary participation help mitigate potential sampling bias.

The screening of questionnaires in terms of missing data and response completeness left a total of 367 usable questionnaires to be analyzed. This is a large enough sample to work with partial least squares structural equation modeling (PLS-SEM) with minimum requirements and is sufficient to test the proposed structural relationships and interaction effects.

3.3. Data Collection Procedure

A structured, self-administered questionnaire was given out electronically and in print version to collect data. The questionnaire had been reviewed before the actual data collection to confirm that it was clear, relevant, and suitable in a contextual manner. The study was said to be academic, and there were no right or wrong answers.

Figure 1: Conceptual framework



To reduce common method bias, it was advised that the respondents provide an answer according to their personal experience, and the phrasing of the items was kept short and simple. The survey comprised both demographic queries and all constructs of the study. Procedural solutions were used to mitigate the common method bias, such as the anonymity of respondents, careful wording of items, and separation of construct measurement. Besides that, post-hoc statistical tests indicated that common method variance was not likely to be a serious issue.

3.4. Measures

All measures for the study constructs were based on already validated scales that were modified to fit the context of Lebanese small and medium-sized enterprises. All scale items were answered on a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The psychometric properties of all constructs were subsequently assessed through measurement model evaluation using reliability and validity criteria prior to structural model testing.

3.4.1. Green training and development (GTD)

Green training and development practice was assessed with five items that were based on the green human resource management scale developed by Masri and Jaaron (2017). The items assess the extent to which organizations train their employees on environmental issues, incorporate these issues into training needs examinations, focus on environmental topics during inductive training programs, utilize online training resources to reduce paper consumption, and value environmental training equally with other training programs within the organization. An increase in the scores means that the perceptions regarding green training and development practices in the organization are stronger.

3.4.2. Green employee empowerment and participation (GEE)

Five items, which were also modified by Masri and Jaaron (2017), were used to measure green employee empowerment and participation. These factors reflect employees' views on their ability to engage in environmental initiatives, including the availability of a green complaint system, opportunities to communicate environmental ideas, chances to participate in discussions and workshops on environmental topics, opportunities to contribute to formulating environmental strategies, and collaboration with top management on environmental issues. The scores are higher, indicating an increase in perceived empowerment and involvement in environmental decision-making.

3.4.3. Employee attitude toward green behavior (ATTGB)

There were four items based on Blok et al. (2015) that were used to assess employee attitudes toward green behavior. These scales assess the evaluative beliefs of employees about the actions of pro-environmental behavior in workplaces, such as personal support of the pursuit of a green behavior, organizational support of the pursuit of a green behavior, personal significance of pro-environmental behavior, and perceptions about the extent of attention the organization pays to the environmental behavior in workplaces. The high scores suggest more positive attitudes towards green behavior.

3.4.4. Green behavioral intention (GBI)

Three items from Mancha and Yoder (2015) were used to measure green behavioral intention. The items measure intentions of the employees to take on environmentally responsible actions in the short run, such as the intention to cut down on carbon footprint, participate in actions that are environmentally friendly, and minimize the abuse of natural resources. Higher scores indicate a greater level of deliberate preparation to engage in green behavior.

3.4.5. Employee green behavior (EGB)

The green behavior of employees was measured on seven items, modified according to Blok et al. (2015). These items gauge the self-reported environmentally responsible actions that are carried out at the workplace, and these include conservation of energy, lessening the use of paper, switching off gadgets that are not in use, and recycling of various materials. The increased scores indicate the increased frequency of employee green behavior.

3.4.6. Green transformational leadership (GTL)

Six items that were based on Chen and Chang (2013) were used to measure green transformational leadership. The items assess how employees perceive their leaders' environmental vision, inspiration, encouragement, role modeling, and the promotion of green ideas. The increased scores suggest more perception of green transformational leadership in the organization.

3.5. Data Analysis Technique

The analysis was conducted with the assistance of the partial least squares structural equation modeling (PLS-SEM) via SmartPLS software. PLS-SEM was selected because it is the best-suited method for prediction-based research; it can handle complex models having many mediators and moderators, and it is strong when the data being analyzed are non-normal. The strategy is also suitable in explorative and theory-expanding studies in the SME setting.

The analysis was done in a two-step manner. To test internal consistency reliability, convergent and discriminant validity, the measurement model was first tested on internal consistency reliability. Second, the structural model was evaluated in order to test the hypothesized relationship, mediation effect, and moderation effect. Significance of path coefficients was tested using bootstrapping where the number of resamples is high.

3.6. Ethical Considerations

The issue of ethics was closely followed during the research. All the respondents were informed that their participation was voluntary, and no identifiable information was obtained. The information was not utilized in any other way but in academics and was processed within the branded research ethics guidelines.

4. RESULTS

4.1. Analysis Procedures

In analysis, GTD represents Green Training and Development (Items = GTD1, GTD2, GTD3, GTD4, GTD5), GEE represents Green Employee Empowerment and participation (Items = GEE1, GEE2, GEE3, GEE4, GEE5), ATTGB represents

Attitude Toward Employee Green Behavior (Items = ATTGB1, ATTGB2, ATTGB3, ATTGB4), EGB represents Employee Green Behavior (Items = EGB1, EGB2, EGB3, EGB4, EGB5, EGB6, EGB7), GTL represents Green Transformational Leadership (Items = GTL1, GTL2, GTL3, GTL4, GTL5, GTL6), GBI represents Green Behavioral Intention (Items = GBI1, GBI2, GBI3). IBM SPSS Statistics version 21 was used to calculate frequencies tables, Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett’s Test of Sphericity. And the hypotheses were tested using SmartPLS software by applying the partial least squares structural equation modeling (PLS-SEM) approach. PLS-SEM analyses were performed in two steps, first the measurement model assessment and then the structural model assessment.

4.2. Respondent Demographic Profile

The survey received 367 valid responses. Gender demographics can be found in Table 1a, where the most common identities were male (n = 194, 52.9%) and female (n = 168, 45.8%). There were also a small portion who identified as nonbinary (n = 1, 0.3%) or selected none of the above (n = 4, 1.1%). Age demographics are summarized in Table 1b where the largest percentages of respondents were between the ages of 40-54 years (n = 156, 42.5%) and 25-39 years (n = 148, 40.3%). There were smaller percentages of respondents who were between 18 and 24 years of age (n = 30, 8.2%), 55-74 years of age (n = 25, 6.8%), under 18 years of age (n = 7, 1.9%), and over 75 years of age (n = 1, 0.3%). Education levels of respondents can be found in Table 1c where most respondents either had a bachelor’s degree (n = 143, 39.0%) or a master’s degree (n = 128, 34.9%). Fewer respondents held doctoral degrees (n = 63, 17.2%) or only had a high school diploma/GED (n = 30, 8.2%). Very few had no diploma (n = 3, 0.8%). As shown in Table 1d, the levels of occupation that respondents held were fairly distributed among the categories. A large number of respondents were managers (n = 145, 39.5%) while senior-level (n = 90, 24.5%), mid-level (n = 68, 18.5%), entry-level (n = 33, 9.0%), and executive (n = 31, 8.4%) employees made up smaller percentages of the sample. Time at current (or most recent) organization is summarized in Table 1e where nearly half of respondents have been at their organization for more than 10 years (n = 174, 47.4%). Other segments of time at organization include 1–3 years (n = 68, 18.5%), 4–6 years (n = 60, 16.3%), 7–10 years (n = 42, 11.4%), and <1 year (n = 23, 6.3%). To enhance representational robustness and avoid sparse industry cells, individual industries were consolidated into broader sectoral categories and reported in Table 1f. Respondents worked in a wide range of industries. The largest percentages were from Trade and Consumer Sector (n = 80, 21.8%), Education (n = 73, 19.9%), Finance and Professional Services (n = 74, 20.2%), and Healthcare and Social Services (n = 75, 20.4%). Other industries included Technology and Innovation (n = 46, 12.5%) and Industry and Manufacturing (n = 19, 5.2%).

4.3. Assessing the Model

4.3.1. Measurement model assessment

Robustness of the measurement model was evaluated through assessing sampling adequacy, factorability, reliability, convergent and divergent validity.

Table 1a: Distribution of gender category

Gender Category	Frequency	Percent	Cumulative percent
Male	194	52.9	52.9
Female	168	45.8	98.6
Nonbinary	1	0.3	98.9
Prefer not to say	4	1.1	100.0
Total	367	100.0	

Table 1b: Distribution of age category

Age Category	Frequency	Percent	Cumulative percent
Under 18	7	1.9	1.9
18-24	30	8.2	10.1
25-39	148	40.3	50.4
40-54	156	42.5	92.9
55-74	25	6.8	99.7
75 or older	1	0.3	100.0
Total	367	100.0	

Table 1c: Distribution of educational level

Educational Level	Frequency	Percent	Cumulative percent
High school or equivalent	30	8.2	8.2
Bachelor’s degree	143	39.0	47.1
Master’s degree	128	34.9	82.0
Doctoral degree	63	17.2	99.2
Less than high school	3	0.8	100.0
Total	367	100.0	

Table 1d: Distribution of occupational level

Occupational Level	Frequency	Percent	Cumulative percent
Entry-level	33	9.0	9.0
Mid-level	68	18.5	27.5
Senior-level	90	24.5	52.0
Managerial	145	39.5	91.6
Executive	31	8.4	100.0
Total	367	100.0	

Table 1e: Distribution of years of experience in the current or most recent workplace/organization

Years of Experience	Frequency	Percent	Cumulative percent
<1 year	23	6.3	6.3
1-3 years	68	18.5	24.8
4-6 years	60	16.3	41.1
7-10 years	42	11.4	52.6
More than 10 years	174	47.4	100.0
Total	367	100.0	

Table 1f: Distribution of industry sector

Industry Sector	Frequency	Percent	Cumulative percent
Technology and Innovation	46	12.5	12.5
Healthcare and Social Services	75	20.4	32.9
Finance and Professional Services	74	20.2	53.1
Education	73	19.9	73
Industry and Manufacturing	19	5.2	78.2
Trade and Consumer Sector	80	21.8	100
Total	367	100.0	

Data suitability for analysis was tested via the Kaiser-Meyer-Olkin (KMO) measure and Bartlett’s Test of Sphericity (Table 2). KMO values ranged from 0.768 (GBI) to 0.903 (GTL), exceeding the 0.50 threshold and indicating “good” to “superb” adequacy (Field, 2024; Hutcheson and Sofroniou, 1999). Bartlett’s Test reached statistical significance for all constructs ($P < 0.001$), rejecting the null hypothesis that the correlation matrix is an identity matrix. These results confirm that the data possess a sufficiently patterned correlation structure for factor analysis (Pallant, 2013).

Using Cronbach’s alpha and composite reliability (ρ_a , ρ_c), internal consistency was tested and found to be sufficient (Table 3), with all values exceeding the 0.70 benchmark demonstrating high internal consistency amongst latent constructs (Nunnally and Bernstein, 1994; Hair et al., 2022). The Average Variance Extracted (AVE) was used to establish convergent validity, with all constructs surpassing the 0.5 threshold (Fornell and Larcker, 1981), which indicate that each construct accounts for more than 50% of the variance in its respective indicators (Table 3).

Using the Fornell-Larcker criterion discriminant validity which states that a construct should be empirically distinct from all other constructs in the model has been confirmed (Table 4) as the square root of each construct’s AVE was greater than its correlation with any other latent construct (Fornell and Larcker, 1981). Outer loadings were examined and most were found to be above the commonly recommended value of 0.70 (Hair et al., 2024) (Table 5). Thus, most latent variables explain more than 50% variance in their indicators. Only one indicator had loadings slightly lower than 0.70, and all factor loadings were statistically significant. Composite reliability values ranged from 0.914 to 0.986 and all AVE values exceeded the 0.50 threshold, confirming strong internal consistency and satisfactory convergent validity across constructs.

4.3.2. Structural model assessment

The structural model was evaluated using the coefficient of determination (R^2), the global goodness of fit (GoF) index, standardized path coefficients, effect sizes (f^2), and mediation and moderation analyses based on bootstrapping procedures (Tables 6–11).

4.3.2.1. Model fit and explained variance

The model demonstrated acceptable explanatory power. Employee attitude toward green behaviour (ATTGB) showed a low level of explained variance ($R^2 = 0.068$), whereas green behavioural intention (GBI) and employee green behaviour (EGB) exhibited moderate levels of explained variance ($R^2 = 0.415$ and $R^2 = 0.512$, respectively). Although the explained variance for employee attitude toward green behaviour is relatively low, this result aligns with theoretical expectations in SME contexts where attitudinal formation is influenced by a wide range of informal, social, and value-based factors beyond formal HR practices. The finding suggests that green attitudes are not easily engineered through organizational mechanisms alone, reinforcing the argument that attitudinal activation represents a diffuse and cognitively complex process rather than a directly controllable outcome. The average R^2 across endogenous constructs was 0.331, indicating that the

Table 2: Results of KMO and Bartlett’s test of sphericity

Construct	Kaiser-Meyer-Olkin measure of sampling adequacy	Bartlett’s test of sphericity P-value
GTD	0.890	0.000
GEE	0.879	0.000
GTL	0.903	0.000
ATTGB	0.824	0.000
EGB	0.842	0.000
GBI	0.768	0.000

Table 3: Results of Cronbach’s alpha, composite reliability and AVE

Construct	Cronbach’s alpha	Composite reliability (ρ_a)	Composite reliability (ρ_c)	Average variance extracted (AVE)
ATTGB	0.903	0.940	0.933	0.778
EGB	0.892	0.906	0.914	0.604
GBI	0.942	0.943	0.963	0.897
GEE	0.943	0.960	0.956	0.813
GTD	0.941	0.954	0.955	0.808
GTL	0.983	0.985	0.986	0.920

Table 4: Results of Fornell-Larcker criterion

Construct	ATTGB	EGB	GBI	GEE	GTD	GTL
ATTGB	0.882	-	-	-	-	-
EGB	0.583	0.777	-	-	-	-
GBI	0.644	0.692	0.947	-	-	-
GEE	0.213	0.439	0.368	0.902	-	-
GTD	0.254	0.421	0.331	0.763	0.899	-
GTL	0.212	0.483	0.408	0.749	0.716	0.959

model explains approximately 33.1% of the variance in the dependent variables.

Overall model fit was assessed using the global goodness of fit (GoF) index, calculated as the geometric mean of the average R^2 and the average variance extracted (AVE). The average AVE across constructs (ATTGB, EGB, GBI, GEE, and GTD) was 0.798, yielding a GoF value of 0.448. According to established benchmarks, GoF values above 0.36 indicate a large effect size (Wetzels et al., 2009). Thus, the obtained GoF suggests strong global model fit, reflecting satisfactory measurement quality and predictive relevance.

4.3.2.2. Collinearity assessment (Inner model VIF)

Collinearity among predictor constructs in the inner model was assessed using variance inflation factor (VIF). All VIFs ranged from 1.000 to 3.008, remaining well below commonly accepted thresholds for problematic multicollinearity (O’Brien, 2007).

The lowest VIF was observed for the path ATTGB → GBI (VIF = 1.000) while paths predicting employee green behaviour (ATTGB → EGB and GBI → EGB) showed low VIF values (1.708). For predictors of employee attitude toward green behaviour, VIF values for GEE (3.008), GTD (2.736), GTL (2.666), and the interaction terms (2.693-2.753) indicate only mild shared variance and no evidence of collinearity that would bias parameter estimates.

Table 5: Outer loading

Indicator	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P-values
ATTGB1 <- ATTGB	0.910	0.909	0.021	43.726	0.000
ATTGB2 <- ATTGB	0.948	0.948	0.007	138.913	0.000
ATTGB3 <- ATTGB	0.936	0.936	0.008	111.390	0.000
ATTGB4 <- ATTGB	0.714	0.711	0.044	16.280	0.000
EGB1 <- EGB	0.802	0.802	0.026	31.250	0.000
EGB2 <- EGB	0.790	0.789	0.025	31.027	0.000
EGB3 <- EGB	0.822	0.822	0.023	35.826	0.000
EGB4 <- EGB	0.864	0.864	0.014	62.699	0.000
EGB5 <- EGB	0.746	0.744	0.034	22.200	0.000
EGB6 <- EGB	0.717	0.715	0.035	20.255	0.000
EGB7 <- EGB	0.685	0.683	0.037	18.675	0.000
GBI1 <- GBI	0.952	0.952	0.007	135.063	0.000
GBI2 <- GBI	0.936	0.936	0.010	93.284	0.000
GBI3 <- GBI	0.952	0.952	0.007	131.126	0.000
GEE1 <- GEE	0.855	0.852	0.033	26.217	0.000
GEE2 <- GEE	0.918	0.917	0.033	28.229	0.000
GEE3 <- GEE	0.904	0.901	0.032	27.827	0.000
GEE4 <- GEE	0.915	0.914	0.033	27.840	0.000
GEE5 <- GEE	0.917	0.917	0.032	28.983	0.000
GTD1 <- GTD	0.914	0.912	0.022	40.709	0.000
GTD2 <- GTD	0.930	0.929	0.022	42.864	0.000
GTD3 <- GTD	0.930	0.928	0.021	43.810	0.000
GTD4 <- GTD	0.842	0.843	0.033	25.656	0.000
GTD5 <- GTD	0.876	0.874	0.023	37.870	0.000
GTL1 <- GTL	0.952	0.952	0.028	33.574	0.000
GTL2 <- GTL	0.965	0.965	0.028	34.567	0.000
GTL3 <- GTL	0.960	0.960	0.028	34.183	0.000
GTL4 <- GTL	0.959	0.958	0.027	35.219	0.000
GTL5 <- GTL	0.961	0.960	0.027	35.134	0.000
GTL6 <- GTL	0.958	0.957	0.028	34.489	0.000

Table 6: Results of R² and GoF

Measure/Construct	R ²	AVE
ATTGB	0.068	0.778
EGB	0.512	0.604
GBI	0.415	0.897
GEE	-	0.813
GTD	-	0.808
Average	0.331	0.78
GoF	0.448	-

Table 7: VIF

Structural path	VIF
ATTGB -> EGB	1.708
ATTGB -> GBI	1.000
GBI -> EGB	1.708
GEE -> ATTGB	3.008
GTD -> ATTGB	2.736
GTL -> ATTGB	2.666
GTL×GEE -> ATTGB	2.693
GTL×GTD -> ATTGB	2.753

Overall, the inner model demonstrates no multicollinearity concerns.

4.3.2.3. Direct effects

Direct effects were assessed and was found that Employee attitude toward green behaviour had a positive and statistically significant effect on employee green behaviour ($\beta = 0.234, t = 3.758, P < 0.001$) and a strong positive effect on green behavioural intention ($\beta = 0.644, t = 14.381, P < 0.001$). Green behavioural

intention also had a significant positive effect on employee green behaviour ($\beta = 0.542, t = 9.350, P < 0.001$). The large effect size of GBI on EGB ($f^2 = 0.352$) suggests that intentional readiness represents the most practically influential driver of employee green behavior in the model.

Among the antecedents of employee attitude toward green behaviour, only green training and development showed a significant positive effect ($\beta = 0.208, t = 2.619, P = 0.009$). Although statistically significant, the effect size of GTD on ATTGB was small ($f^2 = 0.017$), indicating that while training contributes to attitudinal formation, its practical magnitude remains modest in SME contexts. Green employee empowerment and participation ($\beta = 0.021, P = 0.811$) and green transformational leadership ($\beta = 0.044, P = 0.606$) were not significant predictors. Furthermore, neither moderation effect reached statistical significance (GTL × GEE: $\beta = -0.044, P = 0.563$; GTL × GTD: $\beta = 0.060, P = 0.470$), indicating that green transformational leadership did not condition the effects of empowerment or training on employee attitudes.

4.3.2.4. Effect size analysis

Effect sizes (f^2) were examined to assess the substantive contribution of each exogenous construct to the explained variance of the endogenous variables. The results indicate that explanatory power is highly concentrated within the attitudinal-intentional components of the model. Employee attitude toward green behaviour exhibited a large effect on green behavioural intention ($f^2 = 0.708$) and a small but meaningful effect on employee green behaviour ($f^2 = 0.066$). Green behavioural intention, in turn,

Table 8: Effect size

Constructs	ATTGB	EGB	GBI	GEE	GTD	GTL	GTL×GTD	GTL×GEE
ATTGB	-	0.066	0.708	-	-	-	-	-
EGB	-	-	-	-	-	-	-	-
GBI	-	0.352	-	-	-	-	-	-
GEE	0.000	-	-	-	-	-	-	-
GTD	0.017	-	-	-	-	-	-	-
GTL	0.001	-	-	-	-	-	-	-
GTL×GTD	0.002	-	-	-	-	-	-	-
GTL×GEE	0.001	-	-	-	-	-	-	-

Table 9: Path coefficient

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P-values
ATTGB -> EGB	0.234	0.236	0.062	3.758	0.000
ATTGB -> GBI	0.644	0.645	0.045	14.381	0.000
GBI -> EGB	0.542	0.540	0.058	9.350	0.000
GEE -> ATTGB	0.021	0.019	0.086	0.240	0.811
GTD -> ATTGB	0.208	0.216	0.079	2.619	0.009
GTL×GEE -> ATTGB	-0.044	-0.037	0.077	0.578	0.563
GTL×GTD -> ATTGB	0.060	0.054	0.084	0.723	0.470

Table 10: Specific indirect effect

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P-values
GEE -> ATTGB -> EGB	0.005	0.005	0.021	0.230	0.818
GEE -> ATTGB -> GBI	0.013	0.012	0.056	0.239	0.811
GTD -> ATTGB -> EGB	0.049	0.051	0.024	2.023	0.043
GTD -> ATTGB -> GBI	0.134	0.139	0.052	2.563	0.010
ATTGB -> GBI -> EGB	0.349	0.348	0.043	8.106	0.000

Table 11: Hypothesis summary

Hypothesis	Result
H _{1a} : Green training and development positively influence employee attitude toward green behavior	Supported
H _{1b} : Green employee empowerment and participation positively influence employee attitude toward green behavior	Not Supported
H ₂ : Employee attitude toward green behavior positively influences green behavioral intention	Supported
H ₃ : Green behavioral intention positively influences employee green behavior	Supported
H _{4a} : Employee attitude toward green behavior positively mediates the influence of green training and development on employee green behavior	Supported
H _{4b} : Employee attitude toward green behavior positively mediates the influence of green employee empowerment and participation on employee green behavior	Not Supported
H ₅ : Employee attitude toward green behavior positively influences employee green behavior	Supported
H ₆ : Green behavioral intention positively mediates the influence of employee attitude toward green behavior on employee green behavior	Supported
H _{7a} : Green transformational leadership moderates the influence of green training and development on employee attitude toward green behavior	Not Supported
H _{7b} : Green transformational leadership moderates the influence of green employee empowerment and participation on employee attitude toward green behavior	Not Supported

showed a large effect on employee green behaviour ($f^2 = 0.352$), confirming its role as the most influential predictor of behaviour.

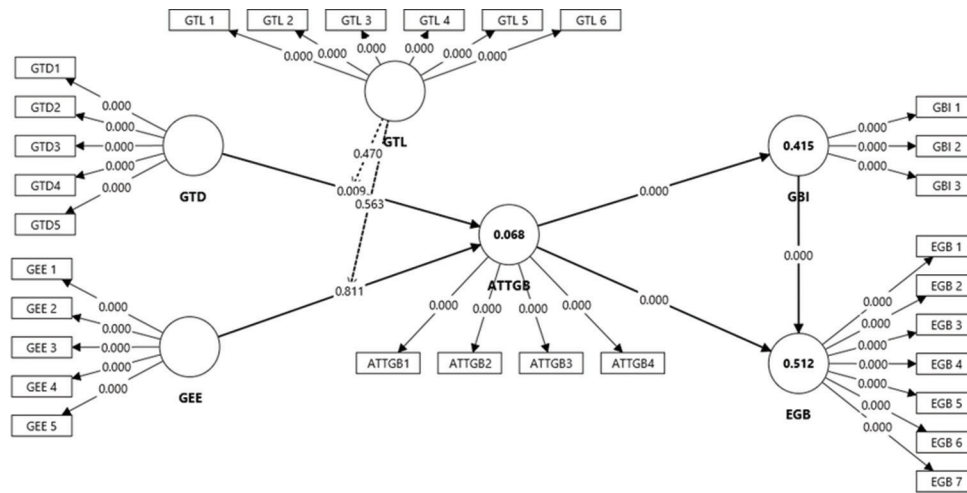
By contrast, organizational antecedents of employee attitude toward green behaviour demonstrated minimal substantive impact. Green training and development had a small effect on ATTGB ($f^2 = 0.017$), while green employee empowerment and participation showed no effect ($f^2 = 0.000$). Green transformational leadership exhibited a negligible effect ($f^2 = 0.001$). Similarly, the interaction terms representing moderation effects were substantively insignificant (GTL × GTD: $f^2 = 0.002$; GTL × GEE: $f^2 = 0.001$). Overall, the effect size analysis indicates that the model’s explanatory strength resides almost entirely within the attitudinal-intentional pathway.

4.3.2.5. Mediation analysis

Mediation was examined through direct and specific indirect effects using bootstrapping (Tables 9 and 10). Results show that green behavioural intention (GBI) partially mediates the relationship between employee attitude toward green behaviour (ATTGB) and employee green behaviour (EGB), where ATTGB exhibited a strong and statistically significant total indirect effect on EGB through GBI ($\beta = 0.349$, $t = 8.106$, $P < 0.001$) and a significant direct effect on EGB ($\beta = 0.234$, $P < 0.001$). Consistent with TPB logic, behavioral intention partially mediated the relationship between employee attitude and employee green behavior.

Green training and development (GTD) demonstrated a significant indirect effect on EGB via ATTGB ($\beta = 0.049$, $t = 2.023$, $P = 0.043$)

Figure 2: Conceptual framework



and a significant indirect effect on GBI via ATTGB ($\beta = 0.134$, $t = 2.563$, $P = 0.010$) all while having a significant direct effect on ATTGB ($\beta = 0.208$, $t = 2.619$, $P = 0.009$).

Finally green employee empowerment (GEE) did not demonstrate any mediated effects neither on EGB nor GBI via ATTGB ($P = 0.818$ and $P = 0.811$ respectively), all while having a non-significant direct effect on ATTGB ($\beta = 0.021$, $t = 0.240$, $P = 0.811$).

4.3.2.6. Moderation analysis

Bootstrapping was used to test the moderation effects of green transformational leadership (GTL) on the relationship between A: green training and development (GTD) and employee attitude toward green behaviour (ATTGB) and between B: green employee empowerment and participation (GEE) and ATTGB. The interaction between GTL and GTD was non-significant ($\beta = 0.060$, $t = 0.723$, $P = 0.470$). Likewise, the interaction between GTL and GEE was also non-significant ($\beta = -0.044$, $t = 0.578$, $P = 0.563$) indicating that GTL had no moderation role in the overall model. Additionally, consistent with the non-significant results, the effect sizes of the interaction terms were trivial ($f^2 \leq 0.002$) showing that none of the interaction terms added explanatory power regarding employees' ATTGB. Overall, the moderation hypotheses were not supported. These findings indicate that moderation effects are not generalizable across the full sample and should be interpreted as context- and subgroup-specific tendencies rather than stable structural relationships. None of the interaction terms reached conventional levels of statistical significance ($P < 0.05$) in the full sample. The age-based multigroup effect for $GTL \times GEE$ approached marginal significance ($P = 0.077$), suggesting a weak exploratory tendency rather than confirmatory evidence of moderation.

4.3.2.7. Hypothesis testing summary

Hypotheses H_{1a} , H_2 , H_3 , H_{4a} , H_5 , and H_6 were supported, establishing the direct and indirect influence of green training and development, employee attitude toward green behaviour, and green behavioural intention; however, hypotheses H_{1b} , H_{4b} , H_{7a} , and H_{7b} were not supported. The model is represented in Figure 2, and a summary of the hypotheses results is tabulated in Table 11.

Table 12: Bootstrapping results – low age group

Path	Original	Mean	Standard deviation	t-value	P-value
ATTGB -> EGB	0.155	0.161	0.073	2.119	0.034
ATTGB -> GBI	0.595	0.595	0.074	8.056	0.000
GBI -> EGB	0.635	0.631	0.065	9.703	0.000
GEE -> ATTGB	0.005	0.007	0.124	0.037	0.970
GTD -> ATTGB	0.313	0.307	0.107	2.928	0.003
GTL -> ATTGB	-0.083	-0.073	0.117	0.707	0.479
GTL×GEE -> ATTGB	0.087	0.087	0.120	0.725	0.468
GTL×GTD -> ATTGB	0.041	0.034	0.127	0.323	0.747

Table 13: Bootstrapping results – high age group

Path	Original	Mean	Standard deviation	t-value	P-value
ATTGB -> EGB	0.363	0.363	0.094	3.851	0.000
ATTGB -> GBI	0.697	0.697	0.050	13.872	0.000
GBI -> EGB	0.405	0.406	0.093	4.336	0.000
GEE -> ATTGB	0.124	0.128	0.131	0.949	0.342
GTD -> ATTGB	0.110	0.136	0.120	0.917	0.359
GTL -> ATTGB	0.099	0.073	0.138	0.721	0.471
GTL×GEE -> ATTGB	-0.202	-0.194	0.114	1.770	0.077
GTL×GTD -> ATTGB	0.138	0.131	0.126	1.093	0.274

4. MULTIGROUP ANALYSIS

Bootstrapping results indicate both commonalities and age-based differences in the structural relationships (Tables 12 and 13). For both age groups, employee attitude toward green behaviour (ATTGB) had a positive and statistically significant effect on employee green behaviour (EGB), with the effect being stronger among older employees (high age: $\beta = 0.363$, $P < 0.001$) than among younger employees (low age: $\beta = 0.155$, $P = 0.034$). ATTGB also positively and significantly influenced green behavioural intention (GBI) in both groups (low age: $\beta = 0.595$, $P < 0.001$; high age: $\beta = 0.697$, $P < 0.001$). In addition, green behavioural intention significantly predicted employee green behaviour for both younger ($\beta = 0.635$, $P < 0.001$) and older employees ($\beta = 0.405$, $P < 0.001$), although the effect was stronger in the low-age group.

With respect to antecedents of employee attitude toward green behaviour, green training and development (GTD) had a positive

and significant effect only among younger employees ($\beta = 0.313$, $P = 0.003$), whereas this relationship was not significant among older employees ($\beta = 0.110$, $P = 0.359$). Green employee empowerment and participation (GEE) and green transformational leadership (GTL) did not significantly influence employee attitude toward green behaviour in either age group. Interaction effects involving green transformational leadership were also largely non-significant; however, the interaction between GTL and GEE approached statistical significance among older employees ($\beta = -0.202$, $P = 0.077$), suggesting a weak tendency for leadership to condition the effect of empowerment on employee attitudes in this group. Given the marginal significance level and the absence of corresponding effects in the full sample, this result is interpreted as an exploratory indication rather than confirmatory evidence of moderation.

5. DISCUSSION

The relationship between the chosen green human resource management practices, more specifically green training and development, green employee empowerment and participation, and employee green behavior in terms of employee attitude toward green behavior and green behavioral intention, with the potential boundary role of green transformational leadership, has been examined in this study. Based on the Theory of Planned Behavior (TPB) and the Ability-Motivation-Opportunity (AMO) model, results would provide an understanding of psychological processes regarding employee green behavior in small and medium enterprises. This discussion will be limited to theoretical as well as practical implications from empirical findings.

5.1. Implications

5.1.1. Theoretical implications

One of the main theoretical contributions of this study is showing why aggregated green human resource management systems frequently do not yield consistent attitudinal effects. By disaggregating green training and development and green employee empowerment and participation, the findings indicate that not all green HR practices trigger the same psychological mechanisms. Ability-enhancing practices seem to be more directly related to evaluative judgments, while opportunity-enhancing practices function in a more conditional and context-sensitive way. This distinction helps to understand why previous studies based on bundled GHRM constructs have found weak or inconsistent attitudinal outcomes.

The results support the functional differentiation between practices that enhance ability and those that enhance opportunity from the perspective of AMO. The significant effect of green training and development supports the argument that cognitive capability-building mechanisms are more directly associated with evaluative judgments, whereas opportunity-enhancing mechanisms such as empowerment may require complementary motivational or structural conditions to influence attitudes. In parallel, the TPB framework is empirically affirmed, as attitudes and intentions emerged as the most proximal determinants of behavior, confirming that psychological readiness rather than structural participation alone explains green behavioral outcomes in SMEs.

The results add to the green HRM and organizational sustainability literature, as they help explain the various roles of green HRM practices in the development of psychological mechanisms at the employee level that are differentiated. One of the practices that has been explored is green training and development, which comes out as the only practice that is closely linked with employee attitude towards green behavior. The outcome supports AMO-based arguments that the ability-enhancing practices are significant factors influencing the evaluative orientations of employees, especially within the SME settings that can be defined by a weak formal sustainability framework.

On the contrary, green employee empowerment and participation fail to show a strong relationship with employee attitudes toward green behavior. This outcome may mirror the contextual characteristics of Lebanese SMEs, which frequently function within hierarchical and owner-centered decision structures. In such contexts, empowerment initiatives may remain symbolic or procedural rather than substantively discretionary. Without clear environmental responsibilities, resources, and structural reinforcement, participation mechanisms might not translate into meaningful evaluative change. This indicates that empowerment in resource-constrained SMEs does not automatically trigger the formation of attitudes unless perhaps supported by, e.g., training, leadership credibility, or institutionalized sustainability systems—issues for future scholars to address. The observation also implies that empowerment efforts will not lead to desirable environmental ratings without adequate decision power, resources, or environmental roles and responsibilities. The outcome suggests that a distinction between nominal participation and substantively meaningful empowerment is crucial in the conceptualization of green HRM.

This study is also a contribution to the TPB literature by showing that both the employee's attitude toward green behavior and green behavioral intention have direct relationships with the employee's green behavior. This trend predisposes a flexible meaning of TPB in organizational contexts, where attitudes and intentions provide supplementary psychological variables instead of factors of a strictly linear cause-effect progression. The mediating effects of the employee attitude in the relation between green training and development and the green behavior of employees further underline the importance of evaluation processes in translating organizational practices into behavioral outcomes.

The results help to answer the question about how rigidly or flexibly one should apply the Theory of Planned Behavior in organizations. Indeed, although the attitudinal-intentional-behavioral sequence was empirically supported (ATTGB \rightarrow GBI \rightarrow EGB), employee attitude had a direct effect on green behavior as well; thus, it is a partial mediation and not strictly sequential. In SME settings with more behavioral discretion and less formal enforcement, employees may act on their evaluative judgment even when behavioral intention has not fully crystallized. These findings imply that TPB should be viewed as a context-sensitive framework rather than one that applies rigidly in mechanistic sequences in organizational sustainability contexts.

Moreover, the mediating effect of green behavioral intention on the relationship between employee attitudes towards green behavior and actual employee green behavior highlights the importance of intentional preparedness as a motivational factor. This mediation is understood in isolation and does not mean a sequential or chain mediation design, which makes the theoretical explanation like the empirical model.

The non-significant moderating effects of green transformational leadership should be theoretically reflected upon with great care. Even though green transformational leadership was included as a contextual predictor in the structural model, it did not have any significant impact on employee attitudes toward green behavior or on the relationships between green HR practices and employee attitudes. Previous literature indicated that environmentally specific transformational leadership could reinforce green HR mechanisms; however, the findings of this study suggest that leadership cues alone may not be adequate to develop evaluative attitudes in Lebanese SME environments.

In many Lebanese SMEs, sustainability systems remain informal, resource-constrained, and weakly institutionalized. Under such conditions, leadership may function more as a symbolic or aspirational signal rather than as a structurally embedded mechanism capable of altering cognitive evaluations. From a contingency perspective, leadership effectiveness depends on the presence of reinforcing systems, accountability mechanisms, and formalized environmental practices. Without such structural support, leadership messages may not translate into stable attitudinal change.

Importantly, the marginal age-based tendency observed in the multigroup analysis suggests that leadership effects may be contingent upon employee characteristics and contextual configurations rather than universally applicable. The exploratory variation indicates that GTL influence may emerge under specific demographic or situational conditions, but not as a stable moderating mechanism across the full sample. Thus, the findings point to the context-sensitive and structurally contingent nature of leadership effects in SME sustainability settings rather than to theoretical inadequacy. Future research may examine whether leadership effects become significant in organizational contexts where environmental systems are more formally institutionalized.

The absence of robust moderation effects should not be interpreted as a theoretical failure but rather as evidence that leadership operates as a distal contextual signal rather than a proximal determinant of attitudinal formation. In SME environments characterized by informal structures and limited institutionalization of sustainability practices, leadership cues may influence how employees interpret empowerment only under specific configurations and demographic conditions. This finding supports a contingency-based view of leadership influence rather than a universal moderating role.

5.1.2. Practical implications

In practical terms, the findings have various implications for managers who are interested in promoting green behavior among employees in SMEs. To begin with, the findings indicate

that green training and development is a particularly effective process of forming the environmental attitudes of employees. Training programs that improve the environmental awareness and knowledge of employees should be given priority by organizations that would like to promote green behavior, as these programs seem more persuasive than the structurally framed empowerment practices with respect to influencing the development of evaluative orientations.

Specifically, SME managers should design green training programs that link environmental knowledge to concrete workplace behaviors, use scenario-based learning, and clarify expected sustainability outcomes. Training should not only raise awareness but also shape evaluative beliefs regarding the consequences and organizational value of green actions. Furthermore, empowerment initiatives should be accompanied by clearly defined environmental roles, access to decision authority, and visible managerial support to avoid perceptions of symbolic participation.

Second, the non-significance of the effects of green employee empowerment and participation on employee attitudes implies that any empowerment programs must be developed carefully to ensure they are substantive rather than merely symbolic. In case it is an event that empowerment would affect attitudes and behavior, managers are supposed to offer employees clear environmental responsibilities, access to suitable resources, and significant chances to participate in environmental decision-making.

Third, the results suggest that the attitudes and intentions of the employees (green behavioral intentions) are applicable in explaining the green behavior of the employees. It means that organizations must counteract employees' knowledge, judgments, motivation, and willingness to act. Effective communication of the environmental objectives and expectations can also contribute to enhancing attitudinal commitment and deliberate involvement.

Lastly, the role of green transformational leadership, which is context-specific, for younger workers implies that leadership strategies might require being customized to the employees' demographics. Leaders who confront younger employees can make empowerment programs more effective by connecting leadership behaviors with environmental values and objectives. The implications in general indicate that cognitively oriented and context-sensitive green HRM practices are necessary in the quest to facilitate green behavior of employees in SMEs.

6. CONCLUSION, LIMITATION, AND FUTURE DIRECTION

6.1. Conclusion

This research paper aimed to investigate the relationship between green human resource management practices and employee green behavior, specifically focusing on employee attitudes towards green behavior and their intentions to engage in such behavior within small and medium-sized enterprises (SMEs). Based on the Theory of Planned Behavior (TPB) and the Ability-Motivation-Opportunity (AMO) model, the paper leads to a more sophisticated

insight into the psychological processes that come along with environmentally responsible conduct in organizations with low-level formalization.

The findings indicate that green training and development (GTD) and green employee empowerment and participation (GEE) have limited ability to directly shape employee attitudes toward green behavior (ATTGB). However, once positive attitudes are present, they translate strongly into green behavioral intentions (GBI) and, in turn, employee green behavior (EGB). This suggests that the main challenge for green HRM lies in influencing employee attitudes rather than in converting attitudes into intentions or behavior. The relationships between employee attitude, green behavioral intention, and green behavior are positive, highlighting the importance of evaluative and motivational processes in explaining environmental responsibility behavior in the workplace. Moreover, green training and development and employee green behavior are correlated through employee attitude, and employee behavioral intention mediates employee attitude and employee green behavior. The findings indicate the significance of both cognitive and deliberate processes without showing a predetermined sequence of causality.

The green transformational leadership failed to moderate any significant relationships between green HRM practices and employee attitude in the entire sample. Multigroup analysis suggests that leadership effects may vary across employee age groups; however, such effects remain weak and context-dependent rather than structurally robust. In general, the results indicate that practices of GHRM have the greatest relationship with the employee's green behavior when they trigger the employee's environmental understanding and evaluative orientations rather than structural or participatory mechanisms alone. These findings reinforce the theoretical distinction proposed by the AMO framework between ability-enhancing and opportunity-enhancing practices and empirically affirm the TPB sequence in which attitudes and intentions serve as the most proximal predictors of behavior within SME contexts.

6.2. Limitations

Despite the contribution, this study has several limitations that ought to be recognized. First, the findings should be interpreted as associative rather than causal, as the cross-sectional design does not allow for temporal ordering or causal inference. The study focuses on explaining relational patterns among cognitive, intentional, and behavioral constructs rather than predicting behavior or establishing causality. Second, the research uses cross-sectional survey data, thereby preventing the possibility of drawing a conclusion based on the temporal sequencing of the variables. Although the study hypothesized relationships can be regarded as being theoretically sound, longitudinal designs would be more evidence-based in terms of how attitudes, intentions, and behaviors remain stable and evolve. Third, the data were gathered within one national setting and with respect to SMEs. Although this context is theoretically applicable because employees' green behavior in such organizations is discretionary, the results may not apply to larger companies or those with more institutionalized environmental management systems. Fourth, the measurement

of all variables was done based on self-reported data, which is prone to common method bias and social desirability effects. Even though procedural and statistical solutions were utilized, future studies would have combined objective or supervisor-rated measures of green behavior. Lastly, the conceptual framework was a set of green HRM practices chosen. There were no other organizational variables, namely, the organizational climate, formal environmental management systems, or external regulatory pressures, which could also impact employee green behavior. In addition, although statistical remedies suggested that common method variance was not a serious concern, reliance on perceptual data may still inflate observed relationships. Future research incorporating multi-source data collection would provide stronger validation of the proposed mechanisms.

6.3. Future Direction

It is possible to determine several possibilities for future research, based on the limitations of the current research. Future researchers can use longitudinal or experimental designs to test how the attitude and intention of the employees towards green behavior changes over time, and the correlation of the attitudes to the longer-lasting behavioral patterns. Future studies may also integrate objective behavioral indicators, such as energy-use records, recycling participation data, or supervisor evaluations, to provide stronger evidence of actual behavioral enactment and reduce reliance on perceptual measures. Cross-organizational or cross-national comparative research would also contribute to clearing up the contextual circumstances within which definite green HRM practices can be the most effective.

Qualitative research, such as in-depth interviews or case studies within SMEs, could further clarify how employees interpret empowerment practices and environmental expectations in hierarchical or resource-constrained settings. Such approaches may reveal contextual mechanisms that are not fully captured through survey-based measurement.

Future studies would also help by investigating the green human resource management practices on an individual basis rather than focusing on them as a functional equivalent or a bundle solution. Conducting a test of the various GHRM practices individually would enable the scholars to determine which GHRM practices are more closely linked with employee attitudes towards green behavior, and which could act via other psychological processes. The findings would help in developing a more microscopic insight into the manner in which certain HR interventions influence employee appraisals within various organizational contexts.

Furthermore, other contextual and organizational boundary conditions, like organizational culture, perceived organizational support for the environment, or job-level autonomy, that may moderate the relationship between green HRM practices and employee green behavior, could be investigated in future studies. Following the age-based variations in the role of green transformational leadership, future studies could be conducted on the demographic differences or differences in the career stage of leadership and empowerment signaling interpretation.

Lastly, future studies may take a configurational or mixed methodological approach to elucidate the complexity of sustainability-related behavior in organizations. This may be achieved through these means to acquire further insight into how organizational practices may interrelate with psychological processes at the employee level to support environmentally responsible behavior.

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