



Perceived ethical leadership, corporate social responsibility, and employee pro-environmental behavior: evidence from Bangladesh

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Abstract

The purpose of this empirical study is to reveal the relationship between perceived (by lower-level managers/supervisors and non-management employees) ethical leadership (PEL) and employee pro-environmental behavior (EPB), considering the mediating role of corporate social responsibility (CSR) within the green garment industry of Bangladesh based on Theory of Planned Behavior (TPB). The independent variable, PEL, is further divided into three constructs: perceived fairness (PF), perceived integrity (PI), and perceived ethical guidance (PEG). The study adopted a deductive research approach using a cross-sectional survey based on purposively selected 190 lower-level managers/supervisors and 200 non-management employees ($n=390$) of 26 Bangladeshi green garment organizations that achieved certification in the “Platinum Category”. We used IBM SPSS 29 for conducting descriptive statistics and PLS-SEM (SmartPLS 4.1.0.3) to test the research hypotheses. First of all, two independent constructs, PI and PEG, were found to have significant positive relationships with the dependent construct, EPB, while PF was found to have a statistically insignificant relationship with EPB. Second, all three independent constructs were found to have significant positive relationships with the mediator, CSR. Third, the mediator itself was found to have a significant positive association with EPB. Finally, CSR was found to have a full mediation in the relationship between PF and EPB, while it was found to have partial mediations in the other two direct relationships (between PI and EPB; and between PEG and EPB). This study is expected to contribute to the upcoming research attempts investigating the role of ethical leadership in motivating positive behavior toward environmental aspects through the sense of CSR within the manufacturing organizations. Further, this research can aid manufacturing organization-related policymakers in motivating their employees toward creating and maintaining an environmentally friendly atmosphere.

Keywords Perceived ethical leadership · Perceived fairness · Perceived integrity · Perceived ethical guidance · Employee pro-environmental behavior · Corporate social responsibility · Theory of Planned Behavior · Green garments

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1 Introduction

Environmental preservation and pro-environmental concerns within the business environment have become the two key issues among researchers, policymakers, and other related stakeholders, such as government monitoring agencies, non-government organizations (NGOs), and donor organizations (Hosain, 2021a). Academics, through their continuous research investigations, and organizational policymakers, through their constant policy-making attempts, are constantly trying to attain corporate environmental performance (CEP) from organizational perspectives (Hosain and Mustafi, 2025). However, among academics, the discussion is still continuing on how to achieve CEP, since no ultimate consensus has yet been empirically established in this regard. Environmental and business experts have so far adopted the issue of pro-environmental business practices from the viewpoints of CEP's indicators in several ways. For instance, Wei et al., (2023) and Iftikar et al., (2022) investigated the effects of environment-concerned workforce management on CEP through employee pro-environmental behavior (EPB).

The most notable and powerful argument for CEP is that the deterioration of ecology has become an alarming worldwide concern (Hosain, 2021a). Consequently, organizations are integrating ecological performance with their formal policies, actions, and practices (Wang et al., 2025; Habib, 2024; Duan et al., 2024; Asiaei et al., 2022; Rehman et al., 2022). Business enterprises worldwide are now adopting and implementing strategies to enhance their pro-environmental performance by inspiring and motivating their employees to contribute to greening the environment (Darvishmotevali & Altinay, 2022). Therefore, EPB has become an indispensable and rising field of academic exploration within the greater management domain (Naz et al., 2023). Besides, EPB is a kind of environment-friendly behavioral attitude performed within an organizational context referring to a particular type of action in employee work settings (Guan et al., 2023). Farrukh et al., (2022) argue that pro-environmental behavior, particularly displayed by the senior managerial employees (such as top-level and mid-level managers), substantially influence other employees (such as lower-level managers/supervisors and non-managerial employees) through positive leadership influence. According to Kim and Lee (2022), EPB may not entirely assist organizations in achieving sustainable improvement of CEP, but it can obviously accelerate organizational efficiency and workforce motivation.

However, indicating the contributory outcomes of EPB, scholars are focusing on revealing its influencing factors, such as perceived organizational support (Ashraf et al., 2022; Hossin et al., 2021), environment-oriented ethical leadership (Mansour et al., 2022; Saleem et al., 2020), green HRM practices (Iftikar et al., 2022), employee enthusiasm, familiarity, and consciousness regarding the environment (Safari et al., 2018; Bissing-Olson et al., 2013); and organizational policies regarding the environment (Ramus & Steger, 2000). Pertinently, based on the evaluation of existing literature, we have identified that there are theoretical and empirical research gaps in revealing the relationship between organizational leaders'/managers' ethical practices and EPB exercised by all employees, both managerial and non-managerial (Nwanzu & Babalola, 2024; Soni, 2023; Fatoki, 2023; Norton et al., 2015). Additionally, there are scarcity of studies regarding the theoretical evidence of how leadership ethics, such as perception of fairness, integrity, and ethical guidelines are connected to EPB (Kim et al., 2024; Nwanzu & Babalola, 2024; Fatoki, 2023; Norton et al., 2015). In this regard, the decision-making employees (top-level and mid-level man-

agers) can have crucial roles in stimulating and inspiring other organizational employees to be committed to protecting natural environment, since organizational leaders/managers are able to delegate emotional and ethical guidelines to their subordinates and colleagues (Wang et al., 2025; Habib, 2024; Duan et al., 2024; Kim et al., 2024; Nwanzu & Babalola, 2024; Fatoki, 2023; Afsar et al., 2016; Barnett et al., 2005). According to Hartog and Hoogh (2009), perceived fairness (PF), perceived integrity (PI), and perceived empowering behavior are three major dimensions to measure PEL.

Following Hartog and Hoogh (2009), we argue that PF, PI, and perceived ethical guidance (PEG) are three dimensions of PEL influencing EPB. However, although, PEG was not originally considered in Hartog and Hoogh's (2009) work, this construct is included as an extension of PEL in our empirical study. In this regard, Rafiq et al., (2024); Afsar et al., (2018); and Robertson & Barling (2013) argue that current studies are unable to explain how immediate leaders can persuade their followers or subordinates to exhibit EPB. Moreover, there is a growing necessity for empirical studies on how ethical leadership can communicate to followers regarding EPB in an organizational context (Ko et al., 2018). Thus, the purpose of this research is to highlight the influence of three dimensions of PEL through which employees (particularly, lower-level managers/supervisors and non-managerial employees) are encouraged to participate in environment-friendly actions and several mechanisms to act in eco-friendly behavioral actions. In addition, we propose that PEL notably encourages EPB through superior corporate social responsibility (CSR) for protecting environment. Supportively, Guan et al. (2023) argue that employees' voluntary, humane, and CSR activities are regarded as factors influencing their pro-environmental actions. However, despite such scholarly outcomes, the quantity of theoretical papers and empirical research studies on the antecedents of EPB is still in a scanty stage in the context of emerging developing countries like China, India, and Bangladesh (Rafiq et al., 2024; Saeed et al., 2019; Afsar et al., 2018). Therefore, the first objective of this research is to assess the relationships between the three constructs of PEL (PF, PI, and PEG) and EPB.

Behavioral scholars (Mansour et al., 2022; Islam et al., 2021; Afsar & Umrani, 2020) also identified that PEL has a significant positive influence on employee behavior through CSR. Even though ethical leaders may influence CSR-based attitudes of their adherents, specifically in relation to EPB, such an argument remains insufficiently proven in the existing literature (Latif et al., 2022; Wu et al., 2021). There are several scholars who highlighted the importance of top-level and mid-level leaders to encourage EPB through CSR (Ren et al., 2021; Khan et al., 2019); although their study outcomes were found inconclusive (Wu et al., 2021), since their findings did not provide any strong evidence due to several methodological limitations and they called for additional empirical research studies to be conducted. As a result, there is an academic and managerial necessity to conduct further empirical studies in this regard. Despite the existence of several studies that examined the impact of CSR efforts on employee behavior and consequences, a notable number of such studies had primarily concentrated on the direct relationship between CSR and employee-based behavior (Guan et al., 2023; Latif et al., 2022), or the association between CSR and organizational productivity (Mansour et al., 2022; Ikram et al., 2020). This study considers CSR, in the nexus between PEL's constructs and EPB, as a mediator rather than an independent variable. Thus, the second objective of this research is to evaluate the mediating roles of CSR in the relationships between three constructs of PEL and EPB.

It should be noted that EPB refers to employee behavior or attitudes that are conducive to conserving the natural environment by practicing lessened energy use, particularly energy produced from fossil fuels, cutting less tress, and recycling the existing wastes. Several theories have been used so far to explain EPB, including Theory of Norm Activation (TNA) (Schwartz, 1968), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1977); and Theory of Planned Behavior (TPB) proposed by Ajzen (1985a, 1985b). One of the most studied theories in the domain of EPB is TPB, which explains the intricate process by which individual intentions are transformed into actual actions (Wu et al., 2021). Besides, Wu et al., (2021) propose this theory as an expanded version of the TRA, whereby individuals' behavioral tendencies are shaped by their attitudes and the normative influence of others. While conducting this study, we were mainly influenced by Ajzen's (1985) TPB, assuming that PEL has an affirmative influence on EPB. Pertinently, in explaining this concept, we argue that individuals (in this study, lower level managers/supervisors and other non-management employees) acquire appropriate behavioral patterns using role modeling and emulating organizational or societal exemplars (in this study, top-level and mid-level managers). Ethical leaders can act as the legitimate exemplars of normative conduct through their deliberate decision-making adherence to principles, attitudes, and moral actions (Saleem et al., 2020). Based on the concept of TPB, we assume that three dimensions of PEL (PF, PI, and PEG) have positive relationships with EPB mediated by CSR.

The garment sector of Bangladesh is making significant economic and social contributions within the country and ultimately to the world economy, which is being witnessed to be growing steadily over time (Islam, 2021; Rahman & Chowdhury, 2020). Consequently, ensuring the practices of EPB is of the utmost concern. The Bangladeshi garment industry substantially contributes to the countrywide economy, generating job opportunities for almost four million citizens (Islam & Halim, 2022). As this sector is the second-largest contributor to the country's revenue and the largest one to generate employment, it is presumed that conformity with the environmental concern is indispensable, particularly considering the sector's ongoing growth in terms of employment (Chowdhury et al., 2023). Additionally, it is worth noting that Bangladesh is having significant advancements in its development, placing itself as a promising growing economy, particularly within Southeast Asia. However, we believe, such a reputation and performance will be sustainable and competitive if the environmental concerns are maintained. The findings of this research is expected to contribute to the existing reservoir of knowledge and facilitate an understanding of the dynamics and obstacles present in the labor-intensive manufacturing sector, specifically in the context of the green garment businesses in a developing country. Based on the existing literature and arguments made so far, the following research questions are expected to be answered by this empirical study:

RQ1: What are the relationships between three constructs of perceived ethical leadership (PEL) [perceived fairness (PF), perceived integrity (PI), and perceived ethical guidance (PEG)] and employee pro-environmental behavior (EPB) within the Bangladeshi green garment industry?

RQ2: Does corporate social responsibility (CSR) mediate (and to what extent: partial or full) the direct relationships?

This empirical paper has eight sections with multiple sub-sections. The first section (Introduction) introduces study background, research objectives, research gap, and expected contributions. Section two (Literature review) presents a critical review of the related existing literature to conceptualize, simplify, and understand all constructs' interrelationships with hypotheses assumed in their foundation. The third section (Research method and methodology) outlines the research methodology used in performing this study. The fourth section (Findings and interpretation) includes a comprehensive analysis and reporting of the data, while the fifth one (Discussion) outlines and compares the present research outcomes with the earlier ones. The sixth section (Implications) of the paper provides theoretical and practical implications, while the seventh section (Limitations) highlights the limitations of this study with further scope for additional research. Finally, the last section (Conclusion) concludes the paper with a brief recap.

2 Literature review

2.1 Underlying theory

The current study assumes that TPB, developed by Ajzen (1985a, 1985b), is the predominant framework employed to elucidate employees' EPB. Additionally, TPB illustrates the intricate behavioral traits exhibited by individuals. Besides, TPB also stands as an expanded version of "Theory of Reasoned Action (TRA)", which states that an individual's behavior is mainly influenced by his/her attributes and norms. In this indicated context, the term "behavior" pertains to an individual's personal attributes, including subjective norms, ethical standards, integrity, leadership abilities, and social affiliations. Due to its robust predictive capacity, this theory (TPB) has emerged as a pioneering concept that operates as a model for forecasting influential factors and behavior across various domains. In environmental management research, the current study proposes that the perception of ethical leadership and CSR significantly influence an individual's inclination toward his/her pro-environmental behavior. According to Wu et al. (2021), the above-mentioned process can be strengthened by an individual's ethical commitment to pro-organizational behavior. In this regard, we argue that within an organizational framework, an employee's pro-organizational behavior is influenced by the prevailing organization's ethical standards, such as CSR, PF, PI, and PEG by his/her superiors, particularly those who hold top-level and mid-level managerial positions (Mansour et al., 2022). These factors serve to encourage ordinary workers to participate in various environment-friendly actions actively.

Relatively, Molnár et al. (2021) highlighted the role of ethical leadership in shaping workers' behavior within their pro-environmental domain. Hence, it is anticipated that PEL and CSR have significant roles in shaping employees' pro-environmental behavior. From this standpoint, PEL pertains to the individual aspects of an employee, whereas CSR refers to the employees' connections to organizations (Mansour et al., 2022). TPB has emerged as a prominent theoretical framework with substantial predictive capabilities (Wu et al., 2021). It provides a valuable tool for anticipating human intentions and actions across several domains within an organization, management, and employee behavior. Particularly, in the area of environmental management, this theory contends that PEL performs a crucial role in shaping individuals' inclination to engage in EPB. According to Mansour et al. (2022),

the efficacy of a behavioral approach may be enhanced by an individual's sense of PEL and CSR concerning his/her EPB. From an organizational perspective, CSR is an organizational factor while PEL is a combined individual factor (in this study, PEL is assumed to be formed by PF, PI, and PEG) influencing various pro-environmental activities.

2.2 EPB

Employees are one of the most vital elements among all the diverse resources of the organizational atmosphere (Ercantan & Eyupoglu, 2022). Moreover, the decision-making employees, particularly, top-level and mid-level managerial employees can play an indispensable role in shaping, influencing, and determining the organizational culture at the various levels of environment-oriented activities. Besides, they can motivate themselves as well as influence other co-workers and subordinates about environment-friendly activities and pro-environmental behavior inside and outside organizations (Norton et al., 2012). Relatively, according to Molnár et al. (2021), employees practice and promote to preserve the natural environment by implementing reduced energy consumption practices that are represented as EPB. In addition, EPB demonstrates employees' perceptions and evaluations regarding organizational policies, measures, and actions concerning CEP (Norton et al., 2015). Apparently, employees place significant importance on environmental sustainability (Saleem et al., 2020), showing a huge apprehension for preserving the natural environment. Interestingly, environmental preservation is also an ethical issue (Ones & Dilchert, 2012); and ethical leaders believe it is their ethical responsibility to defend the natural environment (Wu et al., 2015). According to TPB, EPB is embedded in ethics, morality, and fairness between the leaders (here, top-level and mid-level managers) and followers (here, lower-level managers/supervisors and non-managers) (Norton et al., 2012). If the general employees perceive that they are being treated fairly, justifiably, and with proper guidance, they will believe that their leaders' actions can benefit their organization. Consequently, the subordinates (here, lower-level managers/supervisors and non-managers) will exhibit proper pro-environmental behavior (Treviño et al., 2014).

2.3 PEL

The proper normative behavior of ethical leaders (here, top-level and mid-level managers) can be understood by their course of actions toward the welfare of their followers (lower-level managers/supervisors and non-management employees) (Hosain, 2019a, 2019b; Brown & Treviño, 2006). Besides, ethical leaders are anticipated to emphasize on the happiness of others (in the current context, lower-level managers/supervisors and non-management employees) within the organization rather than their own interests (Northouse, 2021). This perspective indicates that ethical leaders may appoint themselves to organizational ethical practices. Moore et al. (2019) also emphasized the importance of instructing their adherents about the value of ethical codes of behavior for the well-being of various stakeholders, including society and the environment. Employees are expected to observe those following an ethical approach conducive to their organizations, the wider community and the nature. Several scholars (Saleem et al., 2020; Ahmad et al., 2019; Tu & Lu, 2016) further recognized that the existence of ethical leadership contributes to the enhancement of workers' extra-role performance (such as environment-centric activities). In this study, PEL is divided into three further constructs: PF, PI, and PEG.

2.3.1 PF

Fairness is a pertinent component of ethical leadership (Halbusi et al., 2021). Fairness in the organization includes one's feelings, prejudices, and desires to achieve an appropriate equilibrium between contradictory interests (Etu & Tantua, 2021). However, to generate fairness in perception, employers are required to pay superior wages and benefits; and formulate and implement unbiased organizational policies, provide timely, precise, positive performance evaluations, encourage skilled staffs, and develop them through growth opportunities (Etu & Tantua, 2021). The concept of fairness in the decision-making process has been optimistically recognized with the ethical leadership construct developed by Brown and Treviño (2006). According to them, fair and caring behavior of ethical leaders toward their followers is connected to less counter-productive behavioral actions from the followers (employees). On the other hand, Cremer and Knippenberg (2003) argue that a leader's stable use of procedural fairness conveys a positive message to his/her followers. Thus, ethical leadership is shaped by those individuals who are honest, dependable, fair, and thoughtful of others' (followers' or employees') welfare (Toor & Ofori, 2009).

2.3.2 PI

Another distinguished characteristic of an ethical leader is integrity. According to Brown and Treviño (2006), ethical leaders are believed to be honest, helpful, and moral who make fair, justifiable, and impartial decisions. On the other hand, moral managers are believed to be those individuals who manifestly exchange ethical values with their followers; and utilize reward and punishment methods to ensure those standards. On the other hand, Copeland (2016) compared ethical leadership with authentic, spiritual, and transformational leadership. Transformational and ethical leaders have common features like integrity and a caring attitude toward their followers (Huang et al., 2021). Pertinently, according to Palanski and Yammarino (2009), the explanation of integrity includes the components linked with the ethical leadership constructs. The component of "entirety" in integrity, integrated into their categories, embraced characteristics, such as honesty, compassion, and reliability, all accepted as constructive traits of ethical leadership (Brown & Treviño, 2006). In addition, Lilienfeld et al. (2012) recognized truthfulness, consistency, and reliability as significant traits of leadership authority and success. Similarly, Khuntia and Suar (2004) recommends that ethical leaders should integrate ethical principles into their attitudes, principles, and actions.

2.3.3 PEG

In this study, PEG is an extended dimension of PEL, perhaps less explored in academia. An ethical leader is expected to inspire and guide his/her followers ethically, not just directly, to maximize organizational productivity. However, a proper definition and scope of ethical guidance have not been yet identified. Ethical guidance can take varying forms, have varying forces issued by various organizations or individuals; and be intended for various audiences (Smith et al., 2021). They (Smith et al., 2021) in their study, emphasized the significance of ethical guidance for health and social care professionals in the UK; and reported that it is an important factor of PEL. Similarly, Kalshoven et al. (2011) applied an "Ethical

Leadership at Work (ELW)” questionnaire to survey a wider segment of the Dutch employees concerning ethical leadership, as presented by Brown et al. (2005). They identified a noteworthy association between PEL and seven behavioral dimensions: equality, empowerment, role explanation, people orientation, integrity, ethical guidance, and sustainability concern. Halbasi et al. (2021) identified that the actions, strategies, and guidance of ethical leaders can assist employees in raising the moral tone within the organizations successfully. Particularly, they stressed that ethical leaders (in this study, top-level and mid-level managers) must put additional importance on encouraging an ethical atmosphere for offering justified treatment (interpersonal justice) and truthful information (informational justice) through proper and effective guidance.

2.4 CSR

CSR can be termed as organizational society-centric responsibilities and activities to enhance the greater welfare of the neighborhood and society that may or may not be included in their legal guidelines (Latif et al., 2022; Gatti et al., 2019). Organizations dynamically involved in diverse CSR activities are anticipated to obtain manifold advantages, such as enhanced overall performance (Cho et al., 2019), brand loyalty (Aljarah & Ibrahim, 2020), cost-effectiveness (Moggi et al., 2018), and rising brand reputation image (Hosain, 2020; Ramesh et al., 2019). A good number of academics (Bercovici & Bercovici, 2019; Hameed et al., 2019; Suganthi, 2019) recognized the significance of CSR to encourage their environment-centric performance in the epoch of the Fourth Industrial Revolution (4th IR). CSR efforts of an organization can persuade its staffs to be involved in actions and practices that can lessen environmental damages, for instance, consumption of less electricity, avoidance of unnecessary printing, use of double-sided paper prints, and use of stairs in place of electric escalators (Lee et al., 2013). According to Arnaud and Sekerka (2010), organizations encouraging sustainable ethical values can positively influence employees’ beliefs and behavior. Employees study and follow these ethical practices while carrying out definite tasks at their workplaces to improve their organizations.

2.5 PEL and EPB

Ethical leadership supports, encourages, and motivates general employees to achieve their organizational financial, strategic, and environmental objectives. As the role models to their colleagues (or subordinates), ethical leaders (here, top-level and mid-level managers, as assumed) significantly impact the ethical atmosphere inside an organization through the cultivation of fairness and trust; and the alignment of their actions with their stated commitments (Grojean et al., 2004). The identification of ethical leaders by researchers show their ability to foster and instill ethical ideals inside workers; and promote pro-organizational attitudes and behavior while mitigating or reducing negative/unethical pro-organizational behavior (Eva et al., 2020; Naeem et al., 2020; Suifan et al., 2020; Hosain, 2019a, 2019b, 2021b). Justice, sincerity, unselfishness; and moral and communal responsibilities are the basic traits of an ethical leader (Moore et al., 2019; Brown & Treviño, 2006). Particularly, prevailing research outcomes hold the notion that ethical leadership considerably influences an ethical atmosphere (Hansen et al., 2016; Cheng & Wang, 2015; Shin et al., 2015), and pro-organizational behavior (Molnár et al., 2021; Wu et al., 2021; Saleem et al., 2020). To

conclude, existing research studies signify that ethical leadership can psychologically influence EPB regarding green policies and actions, as it can build up and encourage environmental values. Inspired by the arguments made, we propose to test the following research hypotheses:

H1a: PF has a positive relationship with EPB.

H1b: PI has a positive relationship with EPB.

H1c: PEG has a positive relationship with EPB.

2.6 PEL and CSR

The ethical actions of leaders/managers within an organization can influence other workers' opinions and/or activities related to CSR (Nejati et al., 2019; Mostafa & Shen, 2019). Besides, organizational leaders/managers have constant obligations to maintain societal and environmental standards satisfactorily (Pasricha et al., 2018). Numerous academics have further broadened this argument, pointing out that an organization's social responsibilities must be embedded within its moral principles and ethical standards (Zhang et al., 2019; Dabija et al., 2018). A precise leadership style inside organizations can boost employee engagement in CSR actions. Consequently, leaders can significantly involve employees in diverse CSR-related actions (Edinger-Schons et al., 2019). Additionally, the principles and attitudes of the leaders/managers connected to CSR activities can impact their followers' involvement in CSR-oriented activities (Afsar & Umrani, 2020). To accomplish CSR-centric results, organizations require leaders/managers to have strong ethical values and the ability to advocate their followers (here, lower-level managers and non-managers) to engage with additional or voluntary societal and environment-friendly actions. Thus, ethical leaders are branded as the key actors in formulating and implementing organizational CSR activities. They (leaders/managers) can set up standards for their followers (employees) and influence their behavior by establishing organizational standards to preserve social and environmental values (Roeck & Farooq, 2018). CSR is the single mediator in this study. We propose the following research hypotheses to be tested based on the constructed relationships:

H2a: PF has a positive relationship with CSR.

H2b: PI has a positive relationship with CSR.

H2c: PEG has a positive relationship with CSR.

2.7 CSR and EPB

According to Norton et al. (2012), sustainable practices like EPB are anticipated to uphold a constructive organizational image in the industry. Rupp et al. (2013) reported that the insights of CSR make employees concerned about their organizational obligations and perform ethical principles. Consistent with the argument of TPB, CSR conveys encouraging emotional signals to employees. While they learn that their organization is apprehensive about positively influencing the environment with the help of various CSR actions, they feel encouraged and obligated to uphold their organization emotionally (Wu et al., 2021). On the other hand, once employees perceive that their organization is enhancing societal and environmental betterment, they strongly desire to stay with their organization (Hosain, 2020);

and perform diverse optional roles to benefit the environment. In this regard, academics like Aziz et al. (2021); Ates (2020); and Yuriev et al. (2020) also approved the significance of TPB in forming EPB in the context of the 4th IR. Accordingly, in line with TPB, employees tend to evaluate the CSR initiatives of their organization favorably. As a result, these initiatives positively influence many stakeholders, including employees, by enhancing the organization's overall reputation within the community. Therefore, based on the arguments made so far, we propose to test the subsequent research hypothesis:

H3: CSR has a positive relationship with EPB.

2.8 Mediating role of CSR

In this study, we argue that ethical leaders encourage their employees to engage in voluntary and obligatory CSR initiatives. Ethical leadership is quite important for boosting ethical principles as these standards support organizations to be significantly responsive toward societal and environmental performance (Guan et al., 2023; Latif et al., 2022). Ethical leadership may also be CSR-centric and encourage the behavior and actions of their followers to safeguard their society and the nature (Ferreira, 2017). Such ethical leadership is anticipated to bring numerous advantages. One such advantage is that it can encourage employees to demonstrate EPB in the context of the 4th IR (Tian & Robertson, 2019). Ethical leaders emphasize the moral values among their supporters. Consequently, while the general employees view their leaders' (or managers') ethical behavior as constructive, their subjective norms are positive. They further expect to connect themselves with behavioral actions that can optimistically support their organizational obligations to improve their environmental footprint. In addition, ethical leaders concentrate on the value of accountability by ensuring that their subordinates are held liable for their actions. Scholars have acknowledged that the practices of ethical leaders serving as role models significantly shape their employees' behavior (Afsar & Umrani, 2020; Moore et al., 2019). If the followers observe their leaders' ethical behavior in a good manner, it is anticipated that they will mirror their leaders' environment-conscious actions and behavior. Consequently, we postulate the subsequent research hypotheses derived from the demonstrated relationships:

H4a: CSR mediates the positive relationship between PF and EPB.

H4b: CSR mediates the positive relationship between PI and EPB.

H4c: CSR mediates the positive relationship between PEG and EPB.

2.9 Conceptual model

This aim of this empirical research is to fill the gap in the present literature by investigating the relationships between three constructs of PEL (PF, PI, and PEG) and EPB covering the Bangladeshi green garment industry. We also seek to examine the mediation of CSR in these relationships. As far as we know, our consideration of CSR as a mediator in the association between PEL's constructs and EPB is the first attempt in academia (Mansour et al., 2022; Islam et al., 2021; Afsar & Umrani, 2020). Based on the objectives of our study, we propose the following conceptual framework illustrated in Fig. 1 initiated from our own creation:

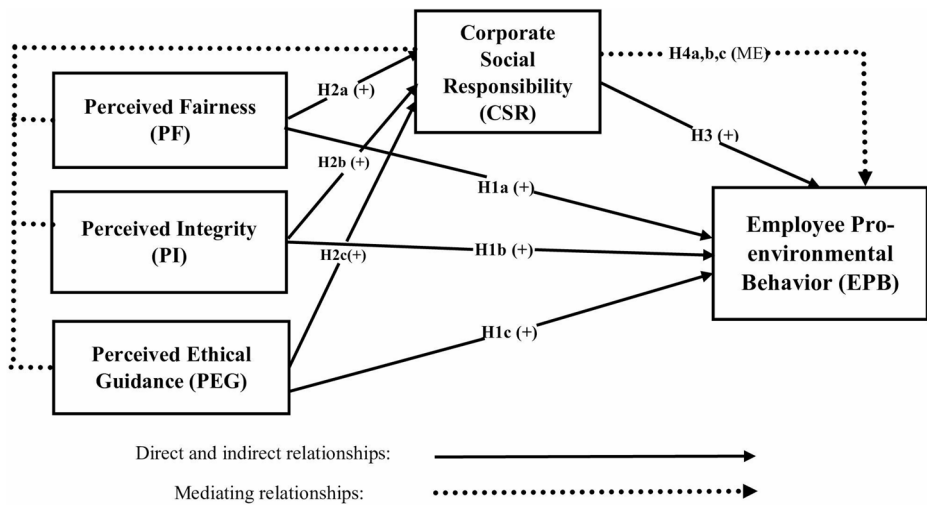


Fig. 1 ME= Mediating effect; Conceptual framework; Source: Researchers' own elaboration

3 Research method and methodology

3.1 Research design, measurement items, and scaling

This study applied a quantitative research approach, using a cross-sectional survey design to obtain primary data from the selected respondents. We identified that compared to longitudinal studies, individuals participating in cross-sectional studies generally exhibit a lesser probability of refusal to cooperate with the researchers (Malhotra & Das, 2017). Consequently, a cross-sectional study is considered to be more convenient in this regard. The exogenous constructs, PF, PI, and PEG were evaluated with five indicators each. The items of PF were adapted from Halbusi et al. (2021); and Etu and Tantua (2021). The items of PI were adapted from Treviño et al. (2000); Treviño et al. (2003); and Brown and Treviño (2006). The items of PEG were adapted from Halbusi et al. (2021); Kalshoven et al. (2011); and Smith et al. (2021). All measurement items were slightly modified in order to match the study's objectives and respective constructs. Moreover, the mediating variable, CSR was investigated with six items derived from Ramesh et al. (2019); Moggi et al. (2018); Cho et al. (2019); and Gatti et al. (2019) with slight modifications. Finally, the endogenous construct, EPB, was assessed using five items collected from Wu et al. (2021); and Saleem et al. (2020) with slight modifications. The questionnaire scales were designed to align with the specific context of Bangladeshi green garment manufacturing sector. The latent variable indicators were determined using a "Five-point Likert Scale", including anchors ranging from "Strongly Disagree (1)" to "Strongly Agree (5)".

3.2 Questionnaire design, data collection, pre-testing, and pilot testing

A standardized survey instrument was used to collect primary data from the respondents. The survey instrument was designed to facilitate effective communication with the respon-

dents by providing versions both in English and Bangla, the local language. In the preliminary stage, we pre-tested the questionnaire using the protocol technique. We included administering the questionnaire to a sample of 12 respondents assessing the adequacy of the survey items' wording and arrangement. Subsequently, a preliminary study was conducted with a sample size of 26 respondents to validate the scales' reliability for the purpose of conducting the comprehensive research project. In previous academic discourse, academics recommended that a sample size of 12 respondents is enough for pre-testing. On the other hand, according to Memon et al. (2017), a sample size ranging from 10 to 30 respondents is considered appropriate for conducting a pilot test. Therefore, the selected sample sizes for pre-testing and pilot testing can be deemed sufficient based on the established criteria by the researchers. The final data collection period was from 1st September 2023 to 31st October 2023.

3.3 Target population, sampling technique, and determination of sample size

While conducting this research, the target population included lower-level managers/supervisors and non-management employees of 26 selected green garment organizations that achieved certification in the "Platinum Category" in Bangladesh. So, the targeted respondents of our analysis consisted of those lower-level managers/supervisors and non-management employees who held permanent positions (at the time of collecting data) at the purposively selected 26 certified green garment organizations. The logic behind selecting only lower-level managers/supervisors and non-management employees as respondents for this study was to identify the constructs of PEL (PF, PI, and PEG) about their superiors (top-level and mid-level managers), as perceived by the respondents, and also to identify how these constructs influence their (respondents') EPB. On the other hand, those 26 green garment organizations were selected based on three basic considerations. First of all, so far, there is no published study available focusing on the issues of PEL and EPB based on the employee responses of Bangladeshi green garment organizations. Second, we wanted to test if the selected constructs of our study were applicable on the Bangladeshi green garment industry. However, although we could not receive all of our expected responses, we still believe that the samples (n) we received were representative to that industry (target population) according to Malhotra and Dash (2017). The respondents' minimum age was 25 years with an upper age limit of 60 years. All of our respondents were academically qualified and capable enough to understand the questionnaire. Third, this research considered the green garment organizations because of its economic contributions to Bangladesh's GDP and environmental concerns, as reported by the Bangladesh Bureau of Statistics (2023).

This study used judgemental (or purposive) sampling technique to collect primary data from those 26 certified green garment organizations in Bangladesh. In this pertinent, Krause (2019) stated that purposive sampling technique is used for respondent selection due to the challenges associated with random sample selection in social science research. Additionally, it was not possible to get a comprehensive sampling frame since a substantial portion of organizations declined to provide the entire list of their lower level managers and non-managerial staffs. Consequently, we were motivated to use a non-probability sampling technique. Relatively, Hulland et al. (2017) found that non-probability sampling techniques may provide good outcomes when researchers want to evaluate theoretical models without making extensive generalizations. In this study, we wanted to validate a research model that

was constructed using earlier theoretical evidence. Hence, the rationale behind using a non-probability sampling technique in this study can be justified.

To determine the appropriate sample size (n) for this study, we utilized G*Power 4.0 software, according to the guidelines provided by Cohen (2013); and the recommendations provided by Westland (2010). Considering the effect size (f^2) of 0.3 and a significance level (α) of 0.05 with five predictors and 26 measurement items, we identified a sample size (n) of 171 as the minimum requirement to achieve 80% statistical power. This threshold, as suggested by Gefen et al. (2011), guarantees the reliability of the model structure and the robustness of the statistical outcomes. However, to secure a superior validity of our research model and representativeness of the data on the population, we opted to collect a higher number of sample size than the minimum requirement indicated by scholars.

Thus, we initially sent out 1000 questionnaires, of which 452 were returned. However, out of those returned instruments, 390 were determined to be complete and accurate, while the other questionnaires were considered invalid. Hence, the final sample size (n) for our investigation was 390. Pertinently, Hair et al. (2010) suggest that a sample size of 200 is sufficient for conducting a PLS-SEM analysis. Furthermore, Malhotra and Dash (2017) recommend that in SEM analysis, each construct should be assessed using at least three items in an empirical study, and the sample size (for SEM analysis) should consist of at least 200 respondents/participants. This research has three independent constructs, each consisting of five items, one mediator consisting of six items and one dependent variable consisting of five items for data analysis. Hence, a total of 390 samples can be considered suitable for data analysis with the achievement of a response rate of 39%. Findings of earlier studies conducted by Rubel et al. (2017); and Amin and Rubel (2020) reported response rates of 29% and 34%, respectively, within the specific context of Bangladesh. Hence, considering the previous research evidence, the sample size (n) of 390 study respondents can be considered appropriate.

3.4 Data analysis techniques and tools

Microsoft Excel was used to enter and sort the data. Additionally, IBM SPSS 29 software was used to conduct descriptive analysis. A variance-based partial least squares structural equation modeling (PLS-SEM) was applied to evaluate the measurement and structural models using SmartPLS 4.1.0.3 software. According to Hair et al. (2014) and Hair et al. (2013), researchers prefer PLS-SEM over covariance-based SEM (such as AMOS), because it is a more accurate statistical method that works well even with non-normal data and small sample sizes. As this study used multiple factors to predict the perceptions of environment-friendly employees, we opted for PLS-SEM as recommended by Hair et al. (2013) because it can make accurate predictions. Another reason why Smart-PLS is better than AMOS is that it can generate data from both composite measurement models and structural models at the same time (Kline, 2016).

4 Findings and interpretation

4.1 Demographic profile

Table 1 demonstrates the respondents' demographic profile. It can be noticed that the proportion of the male respondents was majority in the sample (66.15%) while the highest

Table 1 Demographic features

Criteria	Number	Percentage
Gender		
Male	132	66.15
Female	258	33.85
Total (n)	390	100
Age groups (in years)		
25–34	176	45.13
35–44	97	24.87
45–54	68	17.44
55–60	49	12.56
Total (n)	390	100
Educational level		
Post-Graduation/Master's	209	53.59
Bachelor/BSc/BBA/BA	181	46.41
Total (n)	390	100
Management level		
Lower-level manager/Supervisor	190	48.72
Non-management employees	200	51.28
Total (n)	390	100
Job experience (in years)		
01–10	193	49.49
11–20	96	24.61
21–30	72	18.46
31 or more	29	7.44
Total (n)	390	100

Source: Survey instruments

percentage (45.13%) of the respondents belonged to the age group of 25–34 years. The largest portion (53.59%) of the respondents had a Master's degree. More than half (51.28%) of the respondents were non-management employees, while 48.72% of them were working as lower-level managers or supervisors at the time of collecting data. Finally, 49.49% of the selected respondents had job experience between 1 and 10 years followed by 11 to 20 years (24.61%) and 21 to 30 years (18.46%) respectively.

Therefore, it can be observed that most of our selected respondents were young in age and at the beginning of their careers. However, they were sufficiently educated and had sufficient knowledge about the study's constructs, and therefore, were expected to have sufficient environmental concern.

4.2 Common method bias (CMB)

The sequence of survey parameters was altered in this study. The scale length was reduced following the recommendations of Podsakoff et al. (2003), to address the potential influence of CMB. The preservation of confidentiality about the responses provided by respondents was also maintained. The study also assessed Harman's single-factor test, based on the suggestion of Harman (1976), as a statistical tool for identifying CMB. According to Podsakoff et al. (2003), CMB is not significant in the measurement process, if a single component does not explain more than 50% of the covariance among the measures and variables. In this study, the un-rotated single latent component explained less than 50% of the variation,

particularly 22.32% (Appendix 1). Hence, it can be argued that the CMB was unlikely to provide important obstacles in the context of our investigation.

4.3 Measurement model

This study's measurement model was examined to test the validity and reliability of the items' scales and constructs using confirmatory factor analysis (CFA). Scores for Cronbach's alpha and composite reliability (CR) were used to evaluate the construct reliability. The scores of Cronbach's alpha and CR, as indicated in Table 2, were higher than the minimal requirement of 0.7, suggesting that the model's constructs were reliable enough to be employed. Factor loadings and average variance extracted (AVE) values were also examined as evidence for the verification of convergent validity. Factor loadings over 0.6 and the AVE values larger than 0.5 can be considered as indicators of a construct's convergent validity, according to Hair et al. (2013). Initially, this survey used 26 indicators (Appendix 2). However, after excluding four items due to lower factor loading scores, the number of total item scales was reduced to 22 (Appendix 3). According to Hair et al. (2013), the convergent validity for our constructs as evident in Table 2 was acceptable because all factor loadings, indicating the relationships between items and constructs, were higher than 0.6. Similarly, AVE values, indicating the degree of variance in the items explained by latent constructs, were higher than the suggested threshold level of 0.5.

To assess discriminant validity, we conducted Fornell-Larcker's (1981) criterion and the Heterotrait-Monotrait (HTMT) ratio of correlations, which proved that the constructs were distinguishable from one another (Henseler et al., 2015). Based on the Fornell-Larcker's criterion, the findings can be observed in Table 3, demonstrating that the square root of AVE for all constructs, as indicated by the bold off-diagonal values, exceeded the corresponding correlation coefficients. Therefore, the constructs' discriminant validity score deemed acceptable. According to Henseler et al. (2015), in order to prove discriminant validity, all HTMT values should be below 0.85. In accordance with the results shown in Table 4, all constructs in this study had HTMT values below the necessary threshold of 0.85. Thus, the discriminant validity of this study was achieved, as indicated by Henseler et al. (2015).

4.4 Structural model

To evaluate the structural model and test the hypothesized associations, our study used SmartPLS version 4.1.0.3. The R^2 values were measured to estimate the explanatory power of the study's model. R^2 , which indicates the extent to which a predictor explains the variance of an outcome, was 0.308 for CSR in this research, indicating that PF, PI, and PEG accounted for 30.8% of the variance in CSR. On the other hand, an R^2 value of 0.214 was determined for EPB, indicating that PF, PI, PEG, and CSR together explained 21.4% variance in EPB.

Additionally, the predictive relevance of the path model was assessed by employing the blindfolding examination with an omission distance of 7. We found that the endogenous constructs had Stone-Geisser's Q^2 values greater than zero ($Q^2_{CSR} = 0.167$ and $Q^2_{EPB} = 0.117$) (Geisser, 1974; Stone, 1974). Based on the suggestion of Hair et al. (2017), the path model had adequate cross-validated predictive relevance as shown in Table 5.

Table 2 Measurement model (CFA outputs)

Item code	Constructs and items	Item loadings	Cronbach's alpha	CR	AVE
<i>Perceived Fairness</i>			0.779	0.804	0.507
PF1	An ethical leader should be fair, impartial, and transparent.	0.730			
PF2	Leaders/managers should be fair and transparent in their behavior and actions.	0.709			
PF3	My manager is fair and impartial for all the subordinates.	0.732			
PF5	An ethical leader shows equal interest in all the employees.	0.675			
<i>Perceived Integrity</i>			0.813	0.875	0.637
PI1	An ethical leader is honest.	0.782			
PI2	An ethical leader not only talks but also listens.	0.788			
PI3	An ethical leader can be trusted.	0.793			
PI4	An ethical leader takes not only credit for success, but also blame of failure.	0.828			
<i>Perceived Ethical Guidance</i>			0.761	0.838	0.510
PEG1	An ethical leader guides like a mentor.	0.704			
PEG2	Before making any plan or taking any decision, an ethical leader takes the opinions of all.	0.711			
PEG3	An ethical leader does not punish any staff without prior warning.	0.735			
PEG4	An ethical leader/manager helps the subordinates to grow through his/her efficient guidance.	0.755			
PEG5	Once we perceive a leader as ethical, we obey his/her instructions.	0.661			
<i>Corporate Social Responsibility</i>			0.803	0.863	0.559
CSR1	CSR is an integral part of any organization.	0.675			
CSR2	Organizations should spend a healthy portion of profit for the society and the environment.	0.810			
CSR3	My organization is responsible to the society and the environment.	0.824			
CSR4	The manufacturing organizations should spend more money as CSR expenditures.	0.775			
CSR5	An ethical leader teaches the value of protecting the society and the environment.	0.637			
<i>Employee Pro-environmental Behavior</i>			0.831	0.883	0.655
EPB1	All the employees of my organization are environment friendly.	0.873			
EPB2	My organization arranges training sessions to complete the tasks without harming the environment.	0.831			
EPB3	I try to reduce environment-polluting activities.	0.784			
EPB4	The policies of my organization are aligned with environmental protection.	0.744			

Source: SmartPLS 4.1.0.3

Note: The items “PF4: An ethical leader/manager makes balanced and doable plan (scored 0.537)”; “PI5: An ethical leader shows respect to everyone and forgives unintentional mistakes (scored 0.575)”; “CSR6: My organization has adequate CSR fund (scored 0.493)”; and “EPB5: Ethical leaders can enforce environment-oriented behavior (scored 0.541)” needed to be eliminated from the measurement model due to having poor factor loadings

Table 3 Discriminant validity (Fornell-Larcker criterion)

Constructs	CSR	EPB	PEG	PF	PI
CSR	0.809				
EPB	0.422	0.748			
PEG	0.350	0.318	0.714		
PF	0.281	0.198	0.166	0.712	
PI	0.254	0.139	0.122	0.103	0.698

Source: SmartPLS 4.1.0.3

Table 4 Discriminant validity [Heterotrait-Monotrait (HTMT) ratio]

Constructs	CSR	EPB	PEG	PF	PI
CSR					
EPB	0.472				
PEG	0.423	0.357			
PF	0.362	0.257	0.235		
PI	0.301	0.236	0.214	0.171	

Source: SmartPLS 4.1.0.3

Table 5 Predictive relevance of the path model

Constructs	R^2	Adjusted R^2	Q^2 values
CSR	0.308	0.303	0.167
EPB	0.214	0.206	0.117

Source: SmartPLS 4.1.0.3

Table 6 VIF values for constructs

Constructs	CSR	EPB	PEG	PF	PI
CSR		1.446			
EPB					
PEG	1.075	1.352			
PF	1.033	1.087			
PI	1.057	1.084			

Source: SmartPLS 4.1.0.3

In addition, according to Hair et al. (2017), all constructs had VIF values below 3.3, indicating that there were no concerns with multicollinearity. Table 6 indicates the VIF values of the study.

4.5 Hypotheses testing results (Direct effects and specific indirect effects)

Based on the suggestion of Hair et al. (2017), the path coefficients' weights and significance were determined through a bootstrapping technique (one-tailed) using 5,000 sub-samples. The positive and statistically significant paths from PI to EPB ($\beta = 0.126$; $T = 2.613$; $p < 0.05$), PEG to EPB ($\beta = 0.124$; $T = 2.189$; $p < 0.05$), PF to CSR ($\beta = 0.194$; $T = 4.523$; $p < 0.05$), PI to CSR ($\beta = 0.137$; $T = 2.830$; $p < 0.05$), PEG to CSR ($\beta = 0.438$; $T = 9.156$; $p < 0.05$); and CSR to EPB ($\beta = 0.305$; $T = 5.108$; $p < 0.05$) can be observed from Table 7; Fig. 2. Hence, the hypotheses *H1b*, *H1c*, *H2a*, *H2b*, *H2c*, and *H3* were proven significant or accepted. However, the first hypothesis (*H1a*) indicating the direct path from PF to EPB was found statistically insignificant and thus rejected due to a corresponding p value higher than 0.05 ($\beta = 0.079$; $T = 1.387$; $p > 0.05$).

Table 7 Hypotheses testing results (Direct effects and specific indirect effects)

Hypotheses	Paths	Std. beta	Std. error	T statistics	p values	[2.5% LLCI; 97.5% ULCI]	VIF	Decisions
H1a	PF \diamond EPB	0.079	0.082	1.387	0.166	[-0.032; 0.190]	1.087	Not Supported
H1b	PI \diamond EPB	0.126	0.127	2.613	0.009	[0.044; 0.218]	1.084	Supported
H1c	PEG \diamond EPB	0.124	0.123	2.189	0.029	[0.015; 0.227]	1.352	Supported
H2a	PF \diamond CSR	0.194	0.199	4.523	0.000	[0.125; 0.275]	1.033	Supported
H2b	PI \diamond CSR	0.137	0.138	2.830	0.005	[0.040; 0.231]	1.057	Supported
H2c	PEG \diamond CSR	0.438	0.439	9.156	0.000	[0.352; 0.527]	1.075	Supported
H3	CSR \diamond EPB	0.305	0.304	5.108	0.000	[0.189; 0.412]	1.446	Supported

Note: LLCI=Lower limit confidence interval; ULCI=Upper limit confidence interval

Source: SmartPLS 4.1.0.3

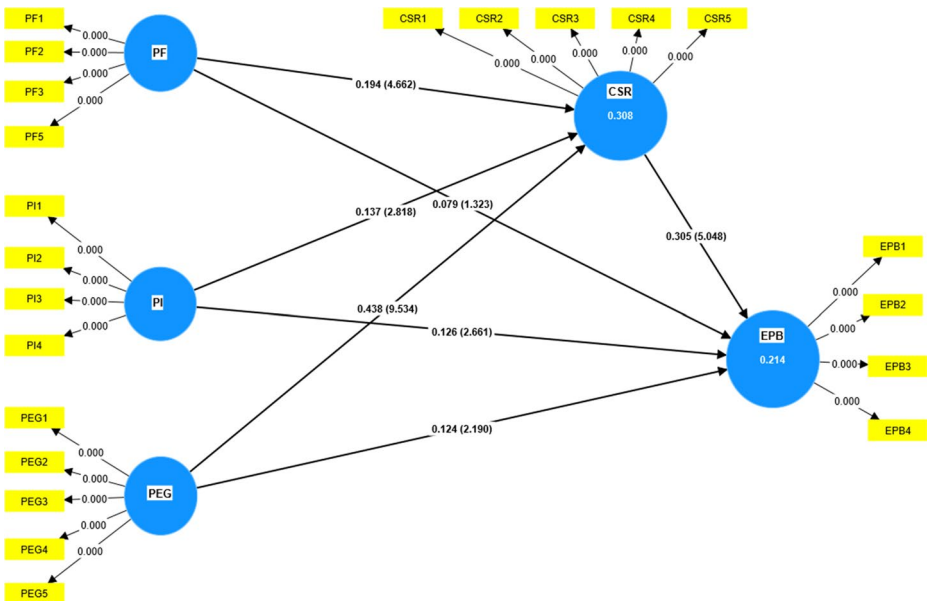


Fig. 2 Structural model; Source: SmartPLS 4.1.0.3

Based on the above outcomes, we can validate that a higher degree of PI and PEG leads to a superior degree of positive EPB. At the same time, PF was not confirmed toward a positive EPB through our empirical analysis. On the other hand, a higher degree of PF, PI, and PEG leads to a superior degree of positive CSR, whereas a superior CSR can have a significant positive relationship with EPB.

4.6 Hypotheses testing results (Mediating effects)

Additionally, the research identified that CSR acts as a mediator in the relationship between each independent construct of PEL (PF, PI, and PEG) and EPB. According to Hayes and Scharkow (2013), mediation is feasible when the specific indirect effects/relationships are substantial. Pertinently, according to Nitzl et al. (2016), mediating impacts may be deemed substantial if there is no zero value between the confidence intervals for the lower and upper limits of the indirect routes. In our study, all the individual indirect effects/relationships were statistically significant, as shown in Table 8, according to the criteria indicated earlier.

Hence, based on the statistical outcomes identified, it can be concluded that PF, PI, and PEG can indirectly affect EPB through positive perceptions of CSR. Consequently, all research hypotheses indicating the mediating relationships, *H4a*, *H4b*, and *H4c* were significantly supported. However, CSR was identified to have a full mediation in relationship between PF and EPB, since the direct effect (between PF and EPB) was insignificant and both the specific indirect effects (between PF and CSR; and between CSR and EPB) were significant. On the other hand, CSR was identified to have partial mediations in the relationships between PI and EPB as well as between PEG and EPB (since all direct effects and specific indirect effects were significant in both the cases).

Table 8 Mediating effects

Hypotheses	Paths	Std. beta	Std. error	T statistics	p values	[2.5% LLCI; 97.5% ULCI]	Mediation type
<i>H4a</i>	PF \diamond CSR \diamond EPB (Mediating effect)	0.059	0.060	3.490	0.001	[0.031, 0.095]	Full mediation
	PF \diamond EPB (Direct effect)	0.079	0.082	1.387	0.166	[-0.032, 0.190]	
	PF \diamond CSR (Indirect effect)	0.194	0.199	4.523	0.000	[0.125, 0.275]	
	CSR \diamond EPB (Indirect effect)	0.305	0.304	5.108	0.000	[0.189, 0.412]	
<i>H4b</i>	PI \diamond CSR \diamond EPB (Mediating effect)	0.042	0.041	2.694	0.007	[0.015, 0.075]	Partial mediation
	PI \diamond EPB (Direct effect)	0.126	0.127	2.613	0.009	[0.044, 0.218]	
	PI \diamond CSR (Indirect effect)	0.137	0.138	2.830	0.005	[0.040, 0.231]	
	CSR \diamond EPB (Indirect effect)	0.305	0.304	5.108	0.000	[0.189, 0.412]	
<i>H4c</i>	PEG \diamond CSR \diamond EPB (Mediating effect)	0.134	0.133	4.703	0.000	[0.081, 0.189]	Partial mediation
	PEG \diamond EPB (Direct effect)	0.124	0.123	2.189	0.029	[0.015, 0.227]	
	PEG \diamond CSR (Indirect effect)	0.438	0.439	9.156	0.000	[0.352, 0.527]	
	CSR \diamond EPB (Indirect effect)	0.305	0.304	5.108	0.000	[0.189, 0.412]	

Source: SmartPLS 4.1.0.3

5 Discussion

According to the study results, PF has an insignificant relationship with EPB. Such an outcome is surprisingly inconsistent with the previous results reported by scholars. As a well-known fact, fairness is an important element of ethical leadership. Hence, this outcome is quite unique and quite rare in academia. Perhaps, the employees of Bangladeshi green garment organizations do not consider/perceive fairness as a significant element of ethical leadership. Again, we identified that PI has a significant positive relationship with the dependent variable, EPB, and this outcome is consistent with a few previous study outcomes reported by Palanski and Yammarino (2009); Brown and Treviño (2006); Khuntia and Suar (2004); and Treviño et al. (2003). According to them, leaders should be ethical in their actions that can influence their followers' pro-organizational, pro-societal, and pro-environmental actions. Regarding the last direct relationship, we identified that PEG is also significantly related to EPB. This result is also supported by several scholars, such as Halbusi et al. (2021); Smith et al. (2021); Kalshoven et al. (2011); and Brown et al. (2005). They emphasized the significance of leaders'/managers' ethical guidance and reported that PEG is an important factor of PEL that can impact the followers'/employees' EPB. On the other hand, we identified a strong positive relationship between CSR and EPB, consistent with the results previously reported by Wu et al. (2021); Hameed et al. (2019); Suganthi (2019); and Moggi et al. (2018). Regarding the mediating effects, we identified that CSR mediates all three direct relationships, supported by numerous scholars, such as Nejati et al. (2019); Afsar and Umrani (2020); Pasricha et al. (2018); and Dabija et al. (2018). Therefore, most of our study results align with the related research findings reported by scholars, except for specific one direct relationship, which may warrant further investigation. The two research questions were also answered clearly after the disclosure of findings through statistical analysis based on survey responses. However, although we found one of the study results (*H1a*) as a bit inconsistent, this outcome can be a subject-matter of new research domain and can open a new window for further research.

It should be noted that there might be different outcomes based on specific organizational and societal culture. Since our study was based on perception-based responses, we might have obtained a little bit different outcomes in our study. We recommend the upcoming researchers to conduct more and more such studies in order to reach a unified and generalized outcome. Such continuous studies can enrich academia and guide the organizational policymakers. The positive relationships between the constructs of PEL (except PF) and EPB mediated by CSR clearly indicate that ethical leaders/managers can motivate their subordinates/employees to be eco-friendly based on personal, as well as organizational ethics and justice. They can also use the social obligations of organizations as the instruments in such a process. In fact, ethics, CSR, and initiation of pro-environmental attitude/behavior are aligned in the same direction (Aziz et al., 2021; Etu & Tantua, 2021). Our study also confirms such an alignment except a minor deviation.

6 Implications for theory and practice

This empirical study is expected to contribute significantly to the existing theory and practice, highlighted in the next two sub-sections.

6.1 Theoretical implications

The components of PEL (except one) were identified to be significant determinants of EPB, and the ethical leaders were identified to play an imperative role in influencing their subordinates'/employees' EPB. Following the concept of TPB, the existing body of research has consistently shown a favorable influence of ethical leadership on the ethical actions/conducts and pro-social behaviors exhibited by employees. Based on the TPB ideology, ethical leadership has been shown to minimize the occurrence of unethical behavior among the general workers (Hosain, 2019a, 2019b, 2021b; Eva et al., 2020; Khan et al., 2019); and is considerably related to different employees' work engagements (Engelbrecht et al., 2017). PEL can considerably manipulate employees' organizational, societal, and environmental attitudes as well as actions (Ferreira, 2017). Thus, TPB indicates that the ethical leaders are pivotal in establishing the moral framework and atmosphere inside organizations (Mayer et al., 2010). Although research studies indicating the positive outcomes of ethical leadership are quite adequate in academia, specific research investigations regarding the influence of different components of PEL on EPB are still rare (Rafiq et al., 2024; Saeed et al., 2019; Afsar et al., 2018). We found noteworthy positive influence of two PEL's constructs on EPB. Our investigative study is not only expected to enrich the present body of literature, but also expected to accelerate the arguments regarding ethical leadership and employee pro-environmental behavior in an emerging economy context. According to TPB, we identified that leaders' ethical role-modeling of the Bangladeshi green garment organizations can influence and shape their employees' attitudes and actions toward maintaining the societal values, and preserving environmental elements by developing fairness, integrity, and proper guidance.

Another major theoretical implication of this study is that it can supplement the PEL-CSR-EPB nexus in the existing literature based on the perceptions of lower-level managers/supervisors and ordinary employees, while a bulk portion of the previous studies emphasized on the relationship between ethical leadership and pro-environmental behavior, based on the top-level and mid-level managerial perceptions. In addition, following TPB's concept, CSR was used to measure EPB focusing on the lower-level managers' and employees' perspectives rather than the whole organizational perspective (Cho et al., 2019). In addition, CSR perception of employees within the green garment industry has not yet been well-explored (Wu et al., 2021; Hameed et al., 2019). Hence, our study is also a significant inclusion to the existing body of literature from this standpoint. Likewise, the incorporation of CSR as a mediator within the suggested connections, particularly within the circumstances of a developing nation, is expected to provide a unique perspective that can contribute to the current reservoir of literature on CSR and corporate leadership. Only a limited number of similar studies are available that have so far highlighted the significance of ethical leadership to promote EPB in the context of 4th IR (Islam et al., 2021; Saleem et al., 2020; Ahmad et al., 2019), although such studies have rarely concentrated on a developing country perspective. Thus, this specific empirical study based on an emerging country perspective can motivate and guide the upcoming researchers in carrying out further studies on this relatively less-researched organizational behavior domain.

6.2 Practical implications

This research has substantial implications for practitioners and professional personnel as well. One notable practical conclusion arising from this work may be the successful identification of a substantial positive correlation between two PEL's constructs and EPB, indicating that employees of the green garment organizations of Bangladesh are conscious concerning their leaders'/managers' ethical leadership that is significant to shape followers'/employees' behavior and can assist to gain organizational pro-environmental objectives. Hence, this study proposes that policymakers should provide training sessions and seminars for their personnel to recognize the ramifications of ethical standards of behavior to foster societal improvement and promote environmental sustainability. This research was performed under the prevailing crisis (such as, COVID-19 after-effects, Israel's invasion on Gaza and Russian invasion on Ukraine), and its subsequent challenges faced by all categories of economies worldwide, including both developed and emerging nations. Particularly, sectors like tourism, airlines, and hospitality were greatly injured by the last COVID-19 pandemic. Due to the widespread economic and environmental crisis experienced in various regions, there was seemingly a substantial decrease in production and consumption for the time being just after the pandemic. However, slowly again, environmental pollution, specifically air and water pollution are significantly rising worldwide due to re-accelerated production and consumption. In addition, we observed an increase in the use of plastic and medical equipments due to the increasing use of various protective garment accessories, wastage, leftovers, and other clothing materials even after the disappearance of COVID-19 pandemic. In this particular context, we propose determining the optimal degree of environmental concern of employees inside green garment organizations in Bangladesh. Similarly, we also recommend green manufacturing and using eco-friendly raw materials, such as organic fibers and jute for all kinds of garment productions.

On the other hand, the outcomes of this study highlights the importance of CSR for manufacture-centric employees to accomplish environmental sustainability. Most of the manufacturing organizations in Bangladesh (and, also in many developing countries) spend their CSR funds for humanitarian purposes, such as community education, setting up water filtration plants, and other charity-related causes while initiatives to enhance environmental performance through diverse CSR actions are rarely being considered (Wu et al., 2021; Edinger-Schons et al., 2019; Dabija et al., 2018). The current study offers fresh approach to the policymakers in raising environmental performance through different CSR actions such as tree plantation, community-based forest projects etc. In this research, we particularly advise the managers or policymakers to give special emphasis on the significance of employees in achieving a sustainable environment and safeguarding natural resources for future generations. The implications mentioned above have significant importance for Bangladesh and other South Asian countries since this particular geographical area is now observing a unique shift in climatic conditions and grappling with the resulting repercussions (Hosain, 2021a). A further practical implication of this empirical research is the revelation of the importance of ethical leadership in shaping the ethical conduct of employees. The study's results indicate that workers see their leaders as role models and are inclined to emulate their behavior. Thus, this particular study offers practical implications and guidelines for the organizational managers and policymakers in understanding and shaping effective CSR policies, that are conducive for the environment and also, motivates general employees to incorporate environmental concerns in their actions and responses.

7 Limitations and further scope

We admit that the current study has several limitations. We believe that these limitations will open new opportunities (as the research gaps) for upcoming researchers to carry out their investigations in the same field. First, in this study, PEL is explained with only three constructs, and we recommend incorporating more constructs/variables in the proposed models for upcoming studies. Further, we recommend adding more mediators or moderators within the tentative future conceptual models. Second, this study considered only one industrial sector of a particular country as the data collection area limiting its scope and generalizability. For the upcoming empirical investigations, we recommend incorporating more sectors/countries/regions, and if possible, making a comparative analysis between the sectors and/or countries/regions.

Finally, we recommend employing both quantitative and qualitative techniques to make future research study outcomes more representative and consistent. The present study used a quantitative approach. The scales used in this study were mostly derived from prior research papers published in reputable academic journals. Utilizing a qualitative methodology to assess the degree of adjustment process and enhance the efficacy of study measures may be more suitable for examining the relative effectiveness of constructs compared to other measures employed, potentially leading to heightened accuracy within the specific context of a developing country (such as, a South Asian country). We strongly feel and believe that the interested researchers will consider these limitations as the research gaps, and overcome such limitations in their further study initiatives.

8 Conclusion

This study underscores and accentuates the significance of PEL concerning EPB, while considering the mediating influence of CSR. The study found that two (PI and PEG) of the three constructs of PEL, and the mediator, CSR have the potential to influence employees' extra-role behavior, specifically in the context of pro-environmental conduct. The research examined the function of CSR in mediating the relationships between PEL's constructs and EPB. The findings indicate that organizations can foster awareness and employee attitudes focused on the environment by implementing ethical leadership practices at different levels of the organizational structure. This research also explores the potential of motivating general employees to fulfil organizations' environmental standards or commitments by examining their pro-environmental behavior within the framework of the 4th IR. However, we propose to make adequate caution when generalizing the results of this study, since organizational and societal cultures may vary, and particular outcomes based on a particular study may not be completely applicable to another country having different cultural norms.

Particularly, this empirical study is an academic attempt to reveal the role of green garment manufacturing sector of a developing country, considering the importance of reducing environmental vulnerability in the country as much as possible. Considering this sector as a labor-intensive one, we agree that if the employees of this sector can demonstrate an enhanced environment-friendly behavior, a climate-friendly sustainable future may be expected. Our study highlights the importance of ethical leadership in framing their subordinates' pro-environmental behavior, and indicates that such behavior can be mediated

though organizational CSR activities. Since, the environment is currently in a vulnerable stage around the world, organizations and particularly, top-level and mid-level managers/leaders have specific responsibilities to pursue their subordinate employees to be environment-friendly; and develop pollution-free policies and practices through different initiatives undertaken by organizational CSR. Our findings may motivate the upcoming researchers, specifically those who want to conduct their research studies in a developing country perspective. Moreover, we hope that the gaps that are mentioned above may be overcome in the upcoming studies. To conclude finally, we expect the findings of this study may be conducive for other developing countries with the same setup, such as, the South Asian or African countries, that are also encountering the similar nature of environmental challenges such as floods, less rainfall, delayed rainfall, deforestation, and plastic pollution.

Appendix 1

Table 9 Harman single factor test (Common method biasness test)

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.802	22.317	22.317	5.802	22.317	22.317
2	2.533	9.744	32.060			
3	2.313	8.897	40.958			
4	2.100	8.075	49.033			
5	1.486	5.715	54.748			
6	1.059	4.075	58.823			
7	1.005	3.866	62.689			
8	0.884	3.401	66.090			
9	0.804	3.093	69.183			
10	0.788	3.030	72.213			
11	0.761	2.925	75.138			
12	0.737	2.834	77.973			
13	0.667	2.566	80.538			
14	0.599	2.303	82.841			
15	0.548	2.106	84.947			
16	0.524	2.016	86.963			
17	0.460	1.771	88.734			
18	0.455	1.750	90.483			
19	0.428	1.648	92.131			
20	0.383	1.471	93.602			
21	0.358	1.376	94.978			
22	0.338	1.301	96.280			
23	0.297	1.144	97.424			
24	0.268	1.030	98.453			
25	0.237	0.912	99.365			
26	0.165	0.635	100.000			

Note: Extraction method: Principal component analysis; Source: Descriptive statistics (SPSS 29)

Appendix 2

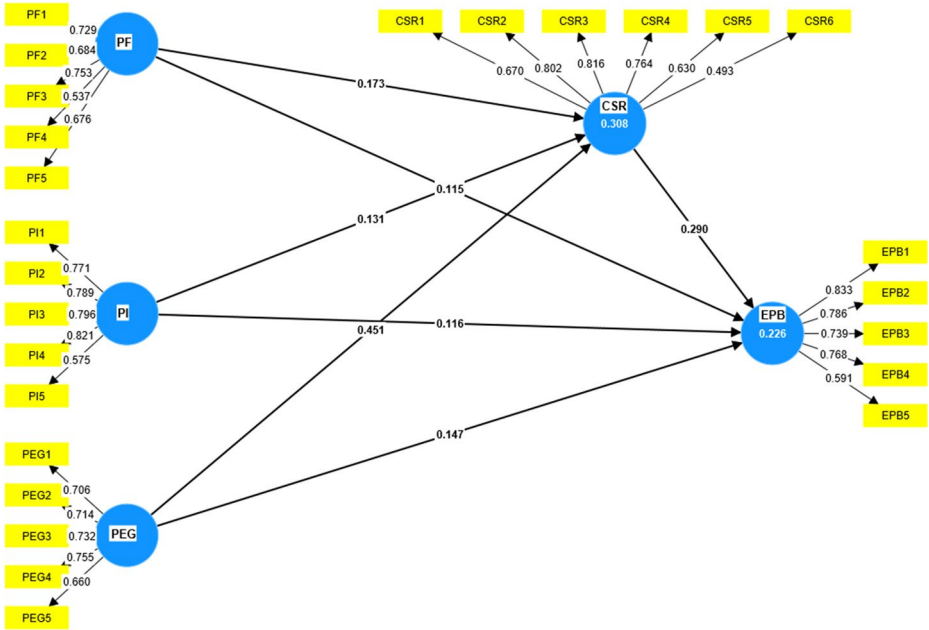


Fig. 3 Measurement model before conducting CFA. Source: Smart-PLS 4.0

Appendix 3

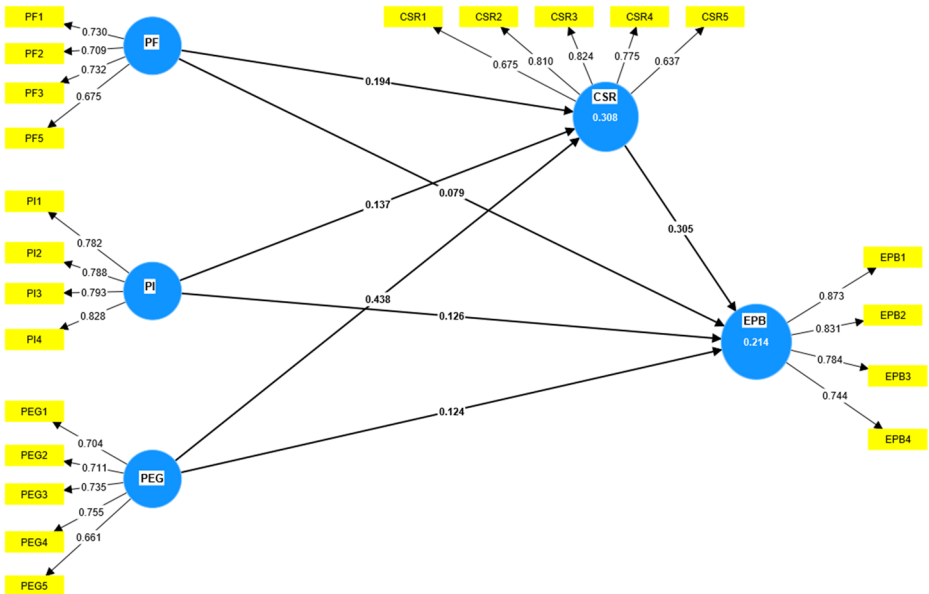


Fig. 4 Measurement model after conducting CFA. Source: Smart-PLS 4.0

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Author contributions All authors contributed to the study on developing the concept and research design. material preparation, data curation, cleaning, and formal analysis were performed by Md Sajjad Hosain, Gouranga Chandra Debnath, Md. Atikur Rahaman. Key Supervision and background were performed by Md. Atikur Rahaman and Hasina Imam. Literature of the study, methodology, and data analysis have done by Mohammad Bin Amin. The first draft of the manuscript was prepared by Md Sajjad Hosain, Mohammad Bin Amin, Gouranga Chandra Debnath and Hasina Imam. All authors contributed on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability The dataset generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval and guideline This is a perception-based study collected from primary data through survey questionnaires. As there were no human participations involved or any kind of clinical trials conducted in this research, there is no obligation to follow any ethical guideline or ethical approval for this study.

Consent to participate We collected informed oral consent from each of the respondents involved in this research. Moreover, written “Letter of Consent to Participate” were collected from each of the study respondents and “Organizational Letter of Approval” were collected from the organizations where the respondents worked during the period of data collection.

Competing interests We declare that we have no known competing financial interests or personal conflicts that could have appeared to influence the work reported in this paper.

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