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Special

Determinants of Pro-Environmental Behavior at Work in Organizations in Southern Colombia

Determinantes do comportamento proambiental no traballo en organizacións do sur de Colombia

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Abstract

Amid growing environmental challenges, understanding the drivers of Pro-Environmental Workplace Behavior (PEWB) in Latin America is crucial, specifically in Huila, Colombia. We assess Blok et al.'s (2015) predictive model, integrating internal and external factors, and Intention to Act (IA) as a mediator. The model is framed within the Theory of Planned Behavior (TPB), which is an extension of the Theory of Reasoned Action (TRA), the Norm Activation Theory (NAT), and the Value-Belief-Norm Theory (VBN). We applied structural equation modeling (SEM) using data from 856 employees in the Huila region. Results indicate that internal factors, IA and leadership behavior directly affect PEWB. Furthermore, perceived behavioral control, environmental values, openness-to-change values, attitudes, and external factors, influence PEWB indirectly through IA. Findings highlight the multivariate nature of PEWB and the limitations of traditional behavioral models, emphasizing that integrative and context-sensitive frameworks are essential for fostering sustainable behavior in organizations in the Huila region.

Keywords: Pro-environmental behavior; Organization; Internal factors; External factors; Organizational sustainability.

Resumo

No contexto dos crecentes desafíos medioambientais, é fundamental comprender os factores que impulsan o comportamento proambiental no lugar de traballo (PEWB) en América Latina, concretamente en Huila, Colombia. Avaliamos o modelo preditivo de Blok et al. (2015), integrando factores internos e externos, e a intención de actuar (IA) como mediador. O modelo enmárcase na Teoría do Comportamento Planificado (TPB), que é unha extensión da Teoría da Acción Razoada (TRA), a Teoría da Activación de Normas (NAT) e a Teoría do Valor-Crenza-Norma (VBN). Aplicamos o modelo de ecuacións estruturais (SEM) utilizando datos de 856 empregados da rexión de Huila. Os resultados indican que os factores internos, a IA e o comportamento de liderado afectan directamente á PEWB. Ademais, o control da conducta percibido, os valores ambientais, os valores de apertura ao cambio, as actitudes e os factores externos inflúen indirectamente na PEWB a través da IA. Os resultados poñen de relevo a natureza multivariante da PEWB e as limitacións dos modelos de conductas tradicionais e subliñan que os marcos integradores e sensibles ao contexto son esenciais para fomentar un comportamento sostible nas organizacións da rexión de Huila.

Palabras chave: Comportamento proambiental; Organización; Factores internos; Factores externos; Sustentabilidade organizacional.

JEL classification: C38; D23; F64; I23; Q56; Q57.

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1. INTRODUCTION

Climate change represents one of the most critical threats to planetary sustainability and human survival, requiring urgent action on both environmental degradation and human behavior—the primary driver of ecological impact (IPCC, 2023; Robertson & Barling, 2015; Sierra-Barón & Meneses Báez, 2018). Scientific evidence highlights how unsustainable practices across home, workplace, commerce, and public life exacerbate environmental harm (Hausknost, 2020; Juma-Michilena et al., 2024; López-Cabanas & Aragonés, 2019). Common problematic behaviors include excessive energy and water consumption use, low recycling rates and the use of toxic material (IPCC, 2023; Nielsen et al., 2024), with these challenges further intensified in developing nations due to limited environmental investment and institutional capacity (Ahmad et al., 2021; Dhrifi et al., 2020).

In a psychosocial study, Aragonés et al. (2006) classified thirty environmental problems into three dimensions: abiotic (water, air, land), biotic (flora, fauna), and anthropogenic, demonstrating that public perceptions of environmental risks are shaped by contextual, demographic, and cultural factors. Importantly cultural norms significantly influence proenvironmental behavior (Amérigo, 2017), underscoring the need for policy and interventions that are not only evidence-based but also context-sensitive.

Governments and international organizations have launched sustainability frameworks, policies, and agreements to promote Pro-Environmental Behavior (PEB) (IPCC, 2023; Jiang et al., 2023; Morin et al., 2020). Within this agenda, organizations play a dual role: While many implement green practices, they also contribute significantly to environmental degradation through industrial activity, energy use, and overproduction (Farooq et al., 2023; Katz et al., 2022; Robertson & Barling, 2013; Suganthi, 2019; Yusliza et al., 2021). As a result, businesses are increasingly called upon to adopt green strategies and embed sustainability at all levels of operation (Esponda-Pérez et al., 2025; Farooq et al., 2023; Yuriev & Sierra-Barón, 2020).

Crucially, these strategies depend largely on employee behavior. Workplace actions such as recycling, conserving resources, and promoting sustainability advocacy are essential for reducing environmental impact and often extend into employees' private lives (Francoeur et al., 2019; Min et al., 2024; Paillé et al., 2019; Yuriev et al., 2018; Zizka et al., 2024). Although certification like ISO 14001:2015 provide organizational guidance (ISO, 2015), many instruments focus on results rather than the behavioral drivers of environmental change (Miah et al., 2024; Mtutu & Thondhlana, 2016). Promoting employee engagement is thus essential to shifting organizational culture toward sustainability (Min et al., 2024; Zizka et al., 2024).

The growing interest in Pro-Environmental Workplace Behavior (PEWB) has led to the development of various models and programs across various national contexts (Abdulghaffar, 2017; Blok et al., 2015; Ones & Dilchert, 2012a; Yuriev et al., 2020b). However, most empirical studies have been conducted in countries such as China, Malaysia, Pakistan, and Russia, examining factors like corporate social responsibility (CSR), leadership, and organizational climate (Ciocirlan, 2016; Khan et al., 2025; Li et al., 2023; Nisar et al., 2021; Paillé et al., 2013; Zacher et al., 2023). In contrast, Latin American region remains largely underrepresented in this literature (Widyanty et al., 2025; Zaidi & Azmi, 2024; Zhang et al., 2024), with a few exceptions in Mexico and Colombia exploring shared ideologies and organizational support (Paillé & Mejía Morelos, 2014; Sierra-Barón & Meneses Báez, 2022a; Yuriev & Sierra-Barón, 2020).

This lack of empirical attention is particularly concerning, given Latin America's high biodiversity, ongoing deforestation, extractive industries, and weak environmental governance. In countries like Colombia, limited regulatory enforcement and institutional fragmentation make it difficult to implement effective environmental policies, increasing the relevance of understanding how workplace behavior can compensate for these systemic gaps. Moreover, cultural values in the region, such as collectivism, respect for authority, and strong social norms, may influence Pro-Environmental Workplace Behavior (PEWB) in unique ways, suggesting that models developed in other regions may not fully capture these dynamics.

This is particularly important given the central role of the private sector in regional development, often in the absence of comprehensive sustainability frameworks. Studying the psychosocial and organizational antecedents of PEWB in this setting is essential for informing culturally adapted interventions, shaping policy, and advancing sustainable practices in economies where environmental infrastructure is still maturing.

Despite these critical dynamics, no empirical studies to date have tested the Blok et al. (2015) integrative model in Latin American organizational settings using Structural Equation Modeling (SEM), nor have they rigorously examined the mediating role of Intention to Act (IA) in this cultural context.

To address this gap, the present study focuses on the department of Huila in Colombia, a region characterized by growing environmental awareness and key productive sectors, but with limited institutional sustainability resources. By applying Blok et al.'s (2015) predictive model, grounded in the Theory of Planned Behavior (TPB), Norm Activation Theory (NAT), and Value-Belief-Norm Theory (VBN, this research aims to generate new empirical evidence on the internal and external determinants of PEWB in an underexplored organizational and cultural setting.

Based on this, the following research question is posed:

What are the direct and indirect effects of internal and external factors on Pro-Environmental Workplace Behavior (PEWB), mediated by Intention to Act (IA), among employees in organizations in the Huila region?

Accordingly, this study aims to examine the direct and indirect effects of internal and external factors on Pro-Environmental Workplace Behavior (PEWB), considering Intention to Act (IA) as a mediating variable, among employees in organizations in the Huila region.

2. LITERATURE REVIEW

Pro-Environmental Behavior at Work (PEBW) is a key element in advancing organizational sustainability, reflecting employees' efforts to reduce environmental impact in the workplace. As interest in this behavior grows, understanding its determinants and expressions becomes essential for fostering sustainable work practices. This study seeks to deepen insights into PEBW through theoretical and empirical analysis, with particular attention to challenges in Latin American contexts.

2.1 Pro-Environmental Behavior at Work (PEWB)

Pro-Environmental Behavior at Work (PEWB) refers to employees' actions aimed at reducing environmental harm in the workplace, whether derived from organizational activities or individual conduct (Alherimi, 2024; Sierra-Barón & Meneses Báez, 2018). These behaviors can be task-related or proactive, extending beyond formal responsibilities (Bissing-

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Olson et al., 2013). PEWB includes activities such as recycling, pollution prevention, and promoting sustainability among colleagues (Foster et al., 2022; Ones & Dilchert, 2012b).

Promoting environmentally friendly actions not only supports ecological preservation but also enhances organizational performance (Alherimi et al., 2024; Mouro & Duarte 2021). The concept of PEWB has gained academic importance by highlighting the crucial role of human behavior in achieving environmental sustainability. It is associated with various forms of pro-environmental conduct, including responsible environmental behavior, sustainable environmental behavior, impactful environmental behavior, green behavior, ecological actions, and environmentally friendly conduct (Omarova & Jo, 2022).

However, despite its theoretical and practical contributions, the conceptualization of PEWB continues to present challenges. Some scholars regard it as an extension of voluntary organizational behavior, while others view it as an autonomous practice, independent of organizational goals. This divergence highlights the conceptual heterogeneity that characterizes the existing literature. For example, Wesselink et al. (2017) outline three research strands: (1) Organizational Citizenship Behavior for the Environment (OCB-E) grounded in voluntary cooperation (Boiral, 2009; Lamm et al., 2015), (2) personal and social determinants based on Kollmuss and Agyeman's (2002) framework, and (3) Employee Green Behavior (EGB), which differentiates between proactive and task-based behaviors (Norton et al., 2014; Ramus & Killmer, 2007).

Recent literature reviews have expanded this field. Zaidi and Azmi (2024) identified six thematic clusters, including green human resource management (HRM) and sustainable consumption, while Widyanty et al. (2025) grouped research into organizational, individual, and HRM factors. Despite the development of several explanatory models, there has been limited empirical validation. (Blok et al., 2015; McDonald, 2014; Young et al., 2015). Moreover, a critical gap persists regarding the relevance and applicability of these models in Latin American and low-income contexts (Ciocirlan, 2016).

In summary, PEWB is essential for fostering organizational sustainability. While its determinants and expressions are increasingly understood, the scarcity of empirical studies, especially in Latin America, underscores the need for more contextually grounded research to enhance both theoretical models and practical implementation.

2.2 Determinants of Pro-Environmental Behavior at Work (PEWB)

The predictive model developed by Blok et al. (2015) offers a comprehensive framework for explaining pro-environmental workplace behavior (PEWB). This model integrates both individual (internal) and organizational (external) factors, positioning Intention to Act (IA) as a key mediating variable between psychological and contextual determinants and observable behavior, in line with the Theory of Planned Behavior (TPB) (Ajzen, 1991).

The model's theoretical structure draws from three complementary frameworks. First, TPB states that behavior is guided by intention, which is influenced by attitudes, subjective norms, and perceived behavioral control (PBC). Second, Norm Activation Theory (NAT) holds that personal norms, moral obligations, are activated when individuals recognize the consequences of their actions and feel personally responsible (Schwartz, 1977, 1994). Third, the Value-Belief-Norm (VBN) theory suggests that personal values, particularly altruistic ones, shape an ecological worldview that activates moral norms, thus motivating pro-environmental behavior (Stern et al, 1999, Stern 2000).

Within this framework, the model highlights several key internal factors. Personal norms (PN) are among the strongest predictors of both IA and PEWB (Blok et al., 2015; Niu et al., 2023; Ruepert et al., 2016; Stern et al., 1999, Stern, 2000Zibarras et al., 2025), with their impact strengthened when contextual variables are present (Yuriev et al., 2020a). Social norms (SN), or shared expectations in the workplace, also positively influence both intention and behavior by promoting behaviors like recycling and energy saving (Blok et al., 2015; Fikria et al., 2024; Gao et al., 2017; Stern et al., 1999; Stern, 2000; Wu et al., 2024). Perceived behavioral control (PBC), reflecting employees' perceived ability to act pro-environmentally, is a consistent predictor of both IA and PEWB (Ajzen, 1991; Wesselink et al., 2017).

Another important factor is environmental awareness (EA), defined as knowledge of the consequences of human behavior on the environment (Grob, 1995). EA is positively associated with both intention and behavior (Blok et al., 2015; Cao et al., 2024; Fu et al., 2020; Norton, 2016). Attitudes toward the environment (ATE), reflecting evaluative beliefs about environmental actions, also predict IA and PEWB (Ajzen & Fishbein, 2004; Blok et al., 2015; Fishbein & Azjen 1975; Norton, 2016). In addition, the need for information (NI) about environmental policies and initiatives indicates employees' curiosity and engagement, serving as a motivational factor for PEWB (Blok et al., 2015; Bertilsson & Remle, 2018).

From the VBN perspective, general values (GV), such as openness to change, altruism, and self-transcendence, significantly influence PN and PEWB (Costa et al., 2022; De Groot & Steg, 2008; Blok et al., 2015; Luís & Silva, 2022; Paillé et al., 2020;). Similarly, environmental values (e.g., biospheric values) reinforce moral norms and intentions (Ruepert et al., 2016), complementing the influence of EA and GV.

The model also incorporates organizational-level (external factors), which, although not central to TPB, align with its constructs. Situational factors (SF) such as access to green infrastructure, facilitate pro-environmental behavior (Blok et al., 2015; Costa et al., 2022; Gusmerotti et al., 2023; Leitão et al., 2024; Ranjan et al., 2021). Exemplary leadership encourages pro-environmental norms and strengthens IA and PEWB (Albrecht et al., 2024; Blok et al., 2015; Gusmerotti et al., 2023; Zhao et al., 2023; Xu et al., 2022), while leadership support exerts a direct influence on PEWB (Blok et al., 2015; Costa et al., 2022; Tosti-Kharas et al., 2016; Luís & Silva, 2022; Paillé et al., 2020).

Organizations aiming to promote sustainability increasingly recognize the importance of employees' engagement in pro-environmental workplace behavior (PEWB). Previous studies highlight that both personal motivation (internal factors) and organizational context (external factors) significantly shape how employees perceive and engage in ecological behaviors at work (Robertson & Barling, 2015; Norton et al., 2015).

Based on this framework, this study classifies the predictors into internal factors (e.g., personal norms, environmental awareness, values) and external factors (e.g., situational factors, exemplary leadership behavior, leader support) to evaluate their direct and indirect effects (via Intention to Act [IA]) on PEWB.

Internal factors such as personal norms, social norms, perceived behavioral control, environmental awareness, attitudes toward the environment, general values (Altruistic values, conservative values, Enhancement values, and openness to Change values), and the need for information on environmental initiatives are expected to directly influence employees' PEWB. Additionally, external factors including situational factors, exemplary leadership behavior, and leader support are hypothesized to have a direct influence on PEWB. Furthermore, intention to act (IA) is posited as a direct predictor of PEWB.

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Study direct effect hypotheses

Hypothesis 1: Personal norms directly influence PEWB.

Hypothesis 2: Social norms directly influence PEWB.

Hypothesis 3: Perceived behavioral control directly influences PEWB.

Hypothesis 4: Environmental awareness directly influences PEWB.

Hypothesis 5: Attitudes toward the environment directly influence PEWB.

Hypothesis 6: Altruistic values directly influence PEWB.

Hypothesis 7: Conservative values directly influence PEWB.

Hypothesis 8: Enhancement values climate directly influences PEWB.

Hypothesis 9: Openness to Change Values directly influences PEWB.

Hypothesis 10: Environmental Values directly influences PEWB.

Hypothesis 11: The need for information on environmental initiatives directly influences PEWB.

Hypothesis 12: Intention to Act directly influences PEWB.

Hypothesis 13: Situational factors directly influence PEWB.

Hypothesis 14: Exemplary leadership behavior directly influences PEWB.

Hypothesis 15: Leader support directly influences PEWB.

Study Mediation Hypotheses

According to the Theory of Planned Behavior and extensions of pro-environmental behavior models in organizational contexts, intention to act (IA) plays a mediating role in translating both internal and external factors into actual behavior. Therefore, the following hypotheses are proposed to test the mediating role of IA in the relationships between internal and external predictors and PEWB:

Hypothesis 15: IA mediates the relationship between personal norms and PEWB.

Hypothesis 16: IA mediates the relationship between social norms and PEWB.

Hypothesis 17: IA mediates the relationship between perceived behavioral control and PEWB.

Hypothesis 18: IA mediates the relationship between environmental awareness and PEWB.

Hypothesis 19: IA mediates the relationship between attitudes toward the environment and PEWB.

Hypothesis 20: IA mediates the relationship between Altruistic values and PEWB.

Hypothesis 21: IA mediates the relationship between Conservative values and PEWB.

Hypothesis 22: IA mediates the relationship between Enhancement values climate and PEWB.

Hypothesis 23: IA mediates the relationship between Openness to Change values and PEWB.

Hypothesis 24: IA mediates the relationship between Environmental values and PEWB.

Hypothesis 25: IA mediates the relationship between the need for information on environmental initiatives and PEWB.

Hypothesis 26: IA mediates the relationship between situational factors and PEWB.

Hypothesis 27: IA mediates the relationship between exemplary leadership behavior and PEWB.

Hypothesis 28: IA mediates the relationship between leader support and PEWB.

3. MATERIALS AND METHODS

3.1 Study

This cross-sectional study examined a model of relationships between personal and organizational employee variables, based on Block's theory (Block et al., 2015) about internal and external factors in PEWB (see section 2.3).

3.2 Participants

The study included a convenience sample of 856 employees from various organizations in the Huila department, all of whom voluntarily provided informed consent. The sample comprised 51.4% women (n = 414) and 48.6% men (n = 416), with a mean age of 35.8 years (SD = 12.7).

Regarding marital status, 63.7% of participants reported having a partner, 25.1% identified as single, 6.4% as divorced, and 4.8% as widowed. In terms of educational attainment, 54% held university or postgraduate degrees, 37.6% had completed technical or technological education, 4.4% had finished high school, and 3% had primary-level education.

The socioeconomic analysis revealed that 75.9% of participants belonged to strata 2–3, with the remaining individuals classified in strata 4 or higher. Concerning employment status, 53.7% held permanent or fixed-term contracts, 23.8% worked under service agreements, 13.3% were engaged in apprenticeships, and 6.3% occupied temporary positions.

Participants reported diverse organizational roles: 62% worked in administrative positions (including support, clerical, specialized, and secretarial roles), 23% served as teachers, instructors, or consultants, 7% held department head roles, and 5% worked in sales.

3.3 Instruments

This study employed scales adapted from Blok et al. (2015) and contextualized by Sierra-Barón and Meneses Báez (2022b) to measure the internal and external factors influencing Pro-Environmental Behavior at Work (PEWB) among employees in the Huila region, Colombia. These factors and their corresponding measurement scales are described as follows:

Internal factors

Personal Norms (PN): Individual beliefs related to a moral obligation to act according to social expectations (Schwartz, 1977), reflecting employees' beliefs about consciously adopting pro-environmental behaviors (Blok et al., 2015). It was measured using a 5-item Likert scale

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(1 = strongly disagree to 4 = strongly agree), with reliability coefficients of α = .75 and Ω = .75.

Social Norms (SN): Shared group beliefs about expected behaviors, influenced by social interaction (Schwartz, 1977), guiding pro-environmental conduct (Blok et al., 2015; Wesselink et al., 2017). It was measured using a 4-item Likert scale, with reliability coefficients of α = .77 and Ω = .77.

Environmental Awareness (EA): Employees' knowledge of human impact on the environment and capacity for responsible action (Grob, 1995). It was measured using an 11-item Likert scale, with reliability coefficients of α = .89 and Ω = .89.

General Values (GV): Fundamental beliefs guiding attitudes and behaviors (Schwartz, 1994; Stern et al., 1999). Four categories of General Values are included Altruistic (concern for others' welfare), Conservative (tradition and social order), Enhancement (autonomy and control), and Openness to Change (individual freedom and collective participation) values (Schwartz, 1994; Stern et al., 1999). It was measured using Likert-type scales, with reliability coefficients ranging α = .69-.74, Ω = .70-.78.

Environmental Values (EV): Beliefs related to environmental protection (Schwartz, 1994; Stern et al., 1999). It was measured using a 4-item Likert scale (α = .79, Ω = .79).

Attitudes Toward the Environment (ATE): Employees' evaluative beliefs about pro-environmental behavior in the work place (Blok et al., 2015; Cordano et al., 2010). It was measured using a 4-item Likert scale (α = .83, Ω = .83).

Need for Information (NI): Employees' interest in organizational environmental initiatives (Blok et al., 2015). It was measured using a 4-item Likert scale (α = .81, Ω = .81).

Perceived Behavioral Control (PBC): Employees' perceptions of their ability to engage in pro-environmental behaviors (Ajzen, 1991; Wesselink et al., 2017). It was measured using a 2-item Likert scale (α = .55, Ω = .59).

Intention to Act (IA): Employees' willingness to engage in pro-environmental behaviors (Ajzen, 1991; Blok et al., 2015; Han & Stoel, 2017; Wesselink et al., 2017). It was measured using a 3-item Likert scale (α = .74, Ω = .75).

External factors

Situational Factors (SF): Employees' perceptions of organizational conditions facilitating or hindering pro-environmental behaviors (Blok et al., 2015). It was measured using a 2-item Likert scale (α = .65, Ω = .72).

Exemplary Leadership Behavior (ELB): Pro-environmental actions modeled by leaders (Blok et al., 2015). It was measured using a 3-item Likert scale (α = .67, Ω = .67).

Leader Support (LS): Perceptions of management support for pro-environmental actions (Blok et al., 2015; Lamm et al., 2015). It was measured using a 6-item Likert scale (α = .80, Ω = .81).

Pro-environmental workplace behavior (PEWB): It is a voluntary, individual-level behavior that contributes to environmental sustainability in organizational contexts (Blok et al., 2015). It was assessed using a 28-item scale with excellent reliability (α = .94, Ω = .94).

3.4 Procedure

The researchers conducted data collection online. Initially, they emailed participants an informed consent form, followed by sociodemographic questionnaires and instruments

designed to measure internal and external factors related to pro-environmental behavior, intention to act, and the Pro-Environmental Behavior at Work (PEWB) Questionnaire. All instruments had been previously validated for the Colombian population.

To identify potential participants, the research team contacted the Neiva Chamber of Commerce. The Chamber provided a list of email addresses and phone numbers from organizations located within the Huila department. Using this information, the team extended invitations to these organizations. Participating organizations then received the questionnaires in digital format. In some instances, they also shared internal employee contact lists to facilitate the direct distribution of the instruments.

Eligibility for participation required individuals to be of legal age, to be employed on-site at an organization within the Huila department, and to hold a position under a legally recognized employment contract in Colombia.

Data Analysis. The data analysis followed a five-step procedure using SPSS v.25.0 and AMOS v.25, in alignment with methodological standards in behavioral research.

Step 1: Preliminary screening

Researchers calculated item- and scale-level non-response rates and conducted descriptive statistics for all sociodemographic variables and for the scales measuring internal factors, external factors, and Pro-Environmental Behavior at Work (PEWB).

Step 2: Testing for normality and correlations

The Kolmogorov–Smirnov test indicated that most variables did not follow a normal distribution ($p > .05$). Accordingly, Spearman's rank-order correlation was used to examine bivariate relationships between internal/external factors, Intention to Act (IA), and PEWB. Correlations were assessed for statistical significance ($p \leq .05$) and to ensure the absence of multicollinearity ($r < .85$), following the criteria proposed by Howitt and Cramer (2017) and Pui-Wa and Qiong (2007).

Step 3: Confirmatory Factor Analysis (CFA)

To evaluate the conceptual validity of the measurement instruments, a CFA was performed using AMOS v.25. Model fit was assessed through the following goodness-of-fit indices: Chi-square (χ^2): $p < .05$ (though sensitive to sample size); Comparative Fit Index (CFI): $> .95$ indicates excellent fit Tucker–Lewis Index (TLI) and Normed Fit Index (NFI): $> .90$ acceptable, $> .95$ excellent Adjusted Goodness-of-Fit Index (AGFI): $> .80$ acceptable Root Mean Square Error of Approximation (RMSEA): $< .05$ excellent; .05–.08 acceptable (Hair et al., 2020; Collier, 2020)

Step 4: Reliability Analysis

Internal consistency for each scale was evaluated using both Cronbach's alpha and McDonald's (2014) omega coefficients, including 95% confidence intervals, estimated through the macro developed by Hayes and Coutts (2020).

Step 5: Structural Equation Modeling (SEM) and Mediation Testing

To test the theoretical model proposed by Blok et al. (2015) —which posits that internal and external factors influence Pro-Environmental Workplace Behavior (PEWB) through Intention to Act (IA)— a Structural Equation Model (SEM) was developed and estimated using AMOS v.25 (Arbuckle, 2017), following recommendations by Hair et al. (2020) and Iacobucci (2008). The model incorporated both latent and observed variables and specified direct paths from internal and external predictors to PEWB, as well as indirect paths mediated by IA.

Estimation was conducted using the maximum likelihood (ML) method. The model was graphically specified using AMOS's path diagram interface. Based on theoretical and conceptual overlap, regression weights from Personal Norms (PN) and Social Norms (SN) to PEWB were constrained to equality, reflecting their shared role as moral constructs (Schwartz,

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1977; Blok et al., 2015). This constraint also helped reduce the number of free parameters (n = 105), thereby improving model parsimony.

To test for mediation, indirect effects were analyzed using bootstrapping methods, consistent with contemporary mediation analysis procedures (e.g., Rozeboom, 1956; Ruiz et al., 2010). Specifically, the significance of indirect paths from internal and external variables to PEWB via IA was evaluated.

Model fit was assessed using standard goodness-of-fit indices, with the following criteria:

Chi-square (χ^2): Reported as a reference statistic

Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI): Values > .90 indicate acceptable fit; > .95 indicate excellent fit

Root Mean Square Error of Approximation (RMSEA): < .05 excellent; .05–.08 acceptable

Adjusted Goodness of Fit Index (AGFI) and Normed Fit Index (NFI): > .90 indicate good fit

This analytical approach allowed for empirical validation of the theoretical model and shed light on the mechanisms by which internal and external factors affect PEWB—both directly and indirectly—through the mediating role of IA, aligning with established principles of mediation theory.

4. RESULTS

This section presents the findings of the study, focusing on the internal and external employee factors that directly and indirectly influence Pro-Environmental Behavior at Work (PEBW).

4.1 Descriptive statistics study variables

The descriptive statistics for the scales measuring internal factors, external factors, Intention to Act (IA), and PEBW are displayed in table 1. Among the internal factors, the Environmental Values Scale (EVS) had the highest mean score (M = 9.98, SD = 3.50), followed by Personal Norms (PN; M = 12.11, SD = 3.87). For external factors, the Leader Support (LS) scale recorded the highest average (M = 14.06, SD = 4.58). The mean score for PEBW was 66.36 (SD = 18.75), indicating a moderately high level of perceived pro-environmental behavior in the workplace.

Table 1. Descriptive Statistics for Internal and External Factors, Intention to Act, and PEBW

Variable	M	SE	95% CI (LI–LS)	Min	Max	SD	Skewness	Kurtosis
PN	12.11	.132	11.85–12.37	5	20	3.87	.26	-.756
SN	12.11	.133	11.85–12.37	5	20	3.89	-.027	-.808
PBC	4.75	.061	4.63–4.87	2	8	1.79	.056	-.948
EA	26.46	.280	25.91–27.01	11	44	8.20	.029	-.693
AV	7.38	.092	7.20–7.56	3	12	2.68	-.088	-1.02

Variable	M	SE	95% CI (LI–LS)	Min	Max	SD	Skewness	Kurtosis
CVS	4.90	.067	4.77–5.03	2	8	1.96	-.041	-1.14
VAM	9.65	.104	9.44–9.85	4	16	3.04	-.031	-.780
OCV	7.27	.090	7.09–7.44	3	12	2.62	-.12	-1.02
EVS	9.98	.119	9.74–10.21	4	16	3.50	-.22	-1.0
ATE	14.31	.168	13.98–14.64	6	24	4.91	-.055	-.96
NI	12.25	.14	11.98–12.53	5	20	4.10	-.10	-.89
SF	4.70	.065	4.58–4.83	2	8	1.89	.10	-1.10
ELB	6.94	.086	6.77–7.11	3	12	1.50	.19	1.0
LS	14.06	.156	13.76–14.37	6	24	4.58	.52	-.93
IA	7.04	.093	6.85–7.22	3	12	2.73	-.016	-1.05
PEWB	66.36	.641	65.11–67.63	28	112	18.75	-.099	-.87

Note. N = 856. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; VAM = Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; IN = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; PEWB = Pro-Environmental Behavior at Work.

4.2 Correlation coefficients between study variables

The Spearman correlation coefficients among all study variables are shown in Table 2. As expected, PEBW presents strong and statistically significant positive correlations with key internal factors such as Environmental Awareness (EA; $\rho = .82$, $p < .01$), Personal Norms (PN; $\rho = .78$, $p < .01$), and Altruistic Values (AV; $\rho = .72$, $p < .01$). External factors also demonstrated significant associations, notably with Leader Support (LS; $\rho = .65$, $p < .01$) and Environmental Leadership Behaviors (ELB; $\rho = .79$, $p < .01$). Intention to Act (IA) was also strongly correlated with PEWB ($\rho = .80$, $p < .01$), reinforcing its mediating role between motivational factors and actual behavior.

4.3 Confirmatory Factor Analysis (CFA)

We conducted a confirmatory factor analysis (CFA) using AMOS v.25 (Arbuckle, 2017) to evaluate the factor structure of internal factors, external factors, Intention to Act (IA), and Pro-Environmental Behavior at Work (PEBW), based on the model proposed by Blok et al. (2015).

The internal factors scale, consisting of 11 subscales and a total of 50 items, showed a good model fit ($\chi^2 = 2440.208$; df = 1259; p = .000; CFI = .943; TLI = .937; NFI = .889; RMSEA = .033), in accordance with Hair et al.'s (2020) criteria for acceptable model fit.

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The external factors scale, which included 3 subscales and 11 items, also demonstrated a strong model fit ($\chi^2 = 93.177$; df = 41; $p = .000$; CFI = .982; TLI = .976; NFI = .969; RMSEA = .039).

The Intention to Act (IA) scale, composed of 3 items, achieved an excellent model fit ($\chi^2 = .102$; df = 1; $p = .75$; CFI = 1.000; TLI = 1.005; NFI = 1.000; RMSEA = .000), meeting the standards recommended by Hair et al. (2020).

Lastly, the PEWB scale, which included 28 items, showed satisfactory model fit indices ($\chi^2 = 1072.669$; df = 350; p = .000; CFI = .919; TLI = .913; NFI = .885; RMSEA = .049), also in line with Hair et al. (2020).

4.4 Reliability Analysis of the Scales

In general, the Colombian scales used in this study (table 3) demonstrated adequate internal consistency (α ≥ .70), with the exception of the scales for Perceived Behavioral Control (α = .55), Situational Factors (α = .65), and Environmental Leadership Behaviors (α = .67), which showed lower reliability coefficients.

As presented in Table 3, the internal consistency coefficients obtained from the Colombian version are generally slightly lower than those reported for the Dutch version (α ≥ .70). An exception to this trend is the Perceived Behavioral Control scale, which demonstrated a higher reliability coefficient in the Colombian sample (α = .55) compared to the Dutch sample (α = .40).

Table 2. Correlation Rho Spearman coefficients for internal and external factors, intention to act and PEWB

Variable	PN	SN	PBC	EA	AV	CVS	EVS	OCV	EVS	AEB	NI	SF	ELB	LS	IA	PEWB
PN	1															
SN	.75**	1														
PBC	.59**	.61**	1													
EA	.80**	.76**	.64**	1												
AV	.67**	.69**	.54**	.75**	1											
CVS	.68**	.63**	.50**	.75**	.69**	1										
EV	.55**	.59**	.46**	.60**	.58**	.57**	1									
OCV	.57**	.61**	.46**	.65**	.60**	.56**	.57**	1								
EVS	.64**	.62**	.51**	.73**	.64**	.63**	.50**	.68**	1							
AEB	.74**	.68**	.54**	.79**	.70**	.66**	.51**	.60**	.73**	1						
NI	.56**	.57**	.49**	.59**	.54**	.50**	.47**	.47**	.55**	.65**	1					
SF	.61**	.58**	.48**	.65**	.56**	.53**	.45**	.49**	.52**	.67**	.60**	1				
ELB	.64**	.66**	.55**	.68**	.63**	.59**	.54**	.56**	.66**	.69**	.66**	.65**	1			
LS	.53**	.50**	.36**	.60**	.52**	.51**	.41**	.61**	.68**	.62**	.49**	.46**	.58**	1		
IA	.66**	.67**	.52**	.71**	.63**	.59**	.53**	.56**	.62**	.67**	.55**	.56**	.66**	.52**	1	
PEWB	.78**	.76**	.60**	.82**	.72**	.69**	.57**	.66**	.74**	.80**	.66**	.69**	.79**	.65**	.80**	1

Note. N = 856; All correlations are Spearman's rho. *p < .05. **p < .01. PN = personal norms; SN = social norms; PBS = perceived behavioral control; EA = environmental awareness; AV = altruistic values; CVS = conservative values; EV = enhancement values; OCV = openness to change values; EVS = environmental values; AEB = attitudes toward the

environment; NI = need for information; SF = situational factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; PEWB = Pro-Environmental Behavior at Work.

Table 3. Reliability coefficients for Internal and External Factors, Intention to Act, and PEBW

Variable	Colombian version					Dutch version			
	# Items	M	SD	α 95% CI (LI–LS)	ω 95% CI (LI–LS)	# Items	M	SD	α
PN	5	2.42	1.08	.75 (.72-78)	.75 (.72-.78)	5	4.10	.67	.84
SN	5	2.42	1.09	.77 (.74-.79)	.77 (.74-.79)	5	4.04	.64	.82
PBC	2	2.38	1.08	.55 (.48-.61)	.59 -	2	3.45	.76	.40
EA	11	2.41	1.09	.89 (.87-.90)	.89 (.87-.90)	11	3.94	.53	.85
AV	3	2.54	1.11	.73 (.70-.76)	.74 (.70-.77)	3	5.15	1.18	78
CVS	2	2.45	1.12	.69 (.64-.74)	.78 -	2	5.0	1.32	.72
VAM	4	2.42	1.05	.69 (.66-.73)	.70 (.66-.73)	4	2.23	1.27	.80
OCV	3	2.42	1.11	.69 (.66-.73)	.70 (.67 -.74)	3	4.5	1.24	.75
EVS	4	2.49	1.11	.79 (.76 -.82)	.79 (.76 -.82)	4	4.83	1.27	.85
AEB	6	2.38	1.11	.83 (.81-.85)	.83 (.81- .85)	5	3.82	.35	.86
NI	5	2.35	1.07	.81(.80- .83)	.81 (.79-.83)	5	3.37	.81	.89
SF	2	2.35	1.10	.65 (.59- .70)	.72-	2	2.87	.62	.64
ELB	3	2.32	1.09	.67 (.62- .70)	.67 (.63-. 70)	3	2.83	.73	.70
LS	6	2.34	1.08	.80 (.78-. 82)	.81(.78- .82)	6	2.37	.66	.87
IA	3	2.35	1.12	.74 (.71- .78)	.75 (.72 -.78)	1			
PEWB	26	2.37	1.09	.93 (.93- .94)	.93 (.93-. 94)	20	2.99	.65	

Note. N = 856. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; EM = Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; NI = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; PEWB = Pro-Environmental Behavior at Work.

4.5 Mediation model

We evaluated the model proposed by Blok et al. (2015), which suggests that both internal factors —including Personal Norms (PN), Social Norms (SN), Perceived Behavioral Control (PBC), Environmental Awareness (EA), Altruistic Values (AV), Conservative Values (CV), Enhancement Values (VAM), Openness to Change Values (OCV); Environmental Values (EV), Attitude toward Environmental Behavior (AEB), and Information Need (NI)— and external factors —situational factors (SF), Exemplary leader behavior (ELB), and leader support (LS) — exert direct and indirect effects on Pro-Environmental Behavior at Work (PEWB), with Intention to Act (IA) serving as a mediating variable. Using structural equation modeling (SEM), we examined both the direct effects and those mediated by IA on PEBW.

Given the high number of free parameters to estimate in SEM and the complexity of the variance-covariance matrix, the initial degrees of freedom resulted in zero, producing a just-identified model. To address this issue, we constrained the regression weight of Personal

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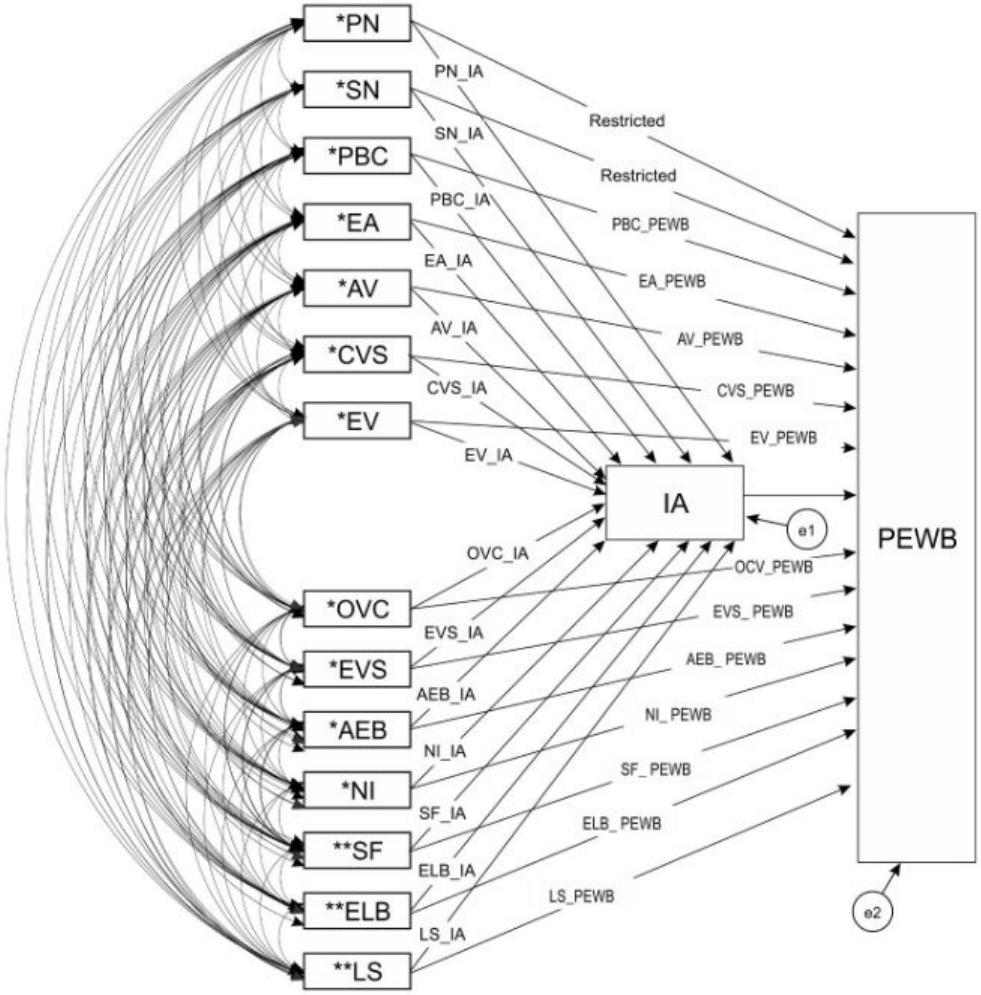
Norms (PN) and Social Norms (SN) on Pro-Environmental Behavior at Work (PEWB). This decision was guided by two main reasons: first, the freely estimated weights for these variables showed close and significant effects on PEWB; second, conceptually, both variables have similar direct effects on PEWB, as suggested by Blok et al. (2015). The constrained model demonstrated satisfactory fit indices ($\chi^2 = 1.328$, df = 1, $p = .249$; CFI = .999; TLI = .997; NFI = 1.000; RMSEA = .020), indicating a good fit of the model to the data. Figure 1 presents the final model adopted for this study.

Figure 1. Model of internal and external factors mediated by IA on PEBW



Note: *N* = 856. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; EM = Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; NI = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; PEWB = Pro-Environmental Behavior at Work; * = Internal factor; ** = External Factor.

The results of the structural equation modeling (SEM) analysis showed the direct effects of the model's variables on Pro-Environmental Behavior at Work (PEWB). Among the internal factors, Personal Norms (PN), Social Norms (SN), Environmental Awareness (EA), Enhancement Values (VAM), Environmental Values (EVS), Attitudes Toward the Environment (AEB), and Need for Information (NI) showed significant and positive direct effects on PEWB ($p < .05$). Similarly, among the external factors, Leadership Support (LS) and Exemplary Leader Behavior (ELB) also demonstrated positive direct effects on pro-environmental

behavior (Table 4). Additionally, Intention to Act (IA) shows a significant direct effect on PEBW. These findings confirm that both personal and contextual factors directly influence employees' pro-environmental behaviors in the workplace, with intention to act working as a mediating variable.

Table 4. Direct effects of internal and external factors and intention to act on PEWB

Variable	b	SE	β	*p*
External factors				
NP+	.483	.069	.100	< .001*
NS+	.483	.069	.100	< .001*
PBC	.218	.188	.021	.246
EA	.160	.069	.070	.020*
AV	.111	.153	.016	.467
CVS	.358	.201	.037	.076
EV	-.230	.111	-.037	.038
OCV	.171	.144	.024	.235
EVS	.269	.124	.050	.030*
AEB	.444	.098	.116	< .001*
NI	1.196	.093	.262	< .001*
IA	.592	.132	.086	< .001*
Internal factors				
SF	.302	.131	.030	.113
ELB	.525	.144	.071	< .001*
LS	.699	.091	.171	< .001*

Note. N = 856; *indicates significant estimates at p < .05. +indicates restricted variables. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; EV= Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; NI = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; PEWB = Pro-Environmental Behavior at Work; SE= Standar Error.

Direct Effects on Intention to Act (IA)

The direct effects of internal and external factors on intention to act (IA) were evaluated (see Table 5). Results indicate that the internal factors—Perceived Behavioral Control (PBC), Environmental Awareness (EA), Enhancement Values (EV); Openness to Change Values (OCV), Environmental Values (EVS), and Attitudes Toward the Environment (AEB)—along with the external factors—Situational Factors (SF), Exemplary Leader Behavior (ELB), and Leader

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Support (LS—showed significant direct effects on IA ($p < .05$), highlighting the relevance of these factors in shaping employees' intentions to engage in pro-environmental behaviors in the work place.

Table 5. Direct effects of internal and external factors on intention to act (IA)

Variable	b	SE	β	*p*
Internal factors				
NP*	.021	.030	.029	.500
NS*	-.044	.029	-.063	.132
PBC	-.190	.048	-.124	< .001*
EA	.039	.018	.117	.029*
AV	-.021	.040	-.020	.603
CVS	.010	.052	.007	.848
EV	-.055	.029	-.061	.058
OCV	.258	.037	.247	< .001*
EVS	.247	.031	.316	< .001*
AEB	.078	.025	.141	.002*
NI	.029	.024	.043	.234
External factors				
SF	.114	.049	.079	.020*
ELB	-.080	.037	-.074	.032*
LS	.089	.023	.150	< .001*

Note. N = 856. *indicates significant estimates at p < .05. +indicates restricted variables. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; EV = Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; NI = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act; SE=Standar Error.

Indirect Effects on Pro-Environmental Behavior at Work (PEWB) through IA

The indirect effects of all variables on Pro-Environmental Behavior at Work (PEBW), mediated by Intention to Act (IA), were assessed. The analysis indicated that the internal factors—Perceived Behavioral Control (PBC), Environmental Awareness (EA), Enhancement Values (EV), Openness to Change Values (OCV), Environmental Values (EVS), and Attitudes Toward the Environment (AEB)—along with the external factors—Situational Factors (SF), Exemplary Leader Behavior (ELB), and Leader Support (LS)—exerted significant indirect effects on PEBW ($p < .05$). These findings suggest that IA effectively mediates the relationship between these variables and PEWB, reinforcing the relevance of intention as a proximal determinant of ecological workplace actions.

Additionally, partial mediation was observed for environmental awareness (EA), openness to change values (OCV), and attitudes toward the environment (AEB), as both

direct and indirect effects on PEWB remained significant. In contrast, full mediation was identified for perceived behavioral control (PBC) and situational factors (SF), indicating that their influence on PEWB operates entirely through IA, consistent with the extended Theory of Planned Behavior. Table 6 summarizes these indirect effects and their confidence intervals.

Table 6. Indirect Effects of the variables on Pro-Environmental Work Behavior (PEWB) through the mediation of Intention to Act (IA)

Parammeter	β	Lower bound	Upper bound	*p*
Internal factors				
PN+_IA_PEWB	.012	-.021	.052	.513
NS+_IA_ PEWB	-.026	-.067	.002	.125
PBC _IA_ PEWB	-.112	-.197	-.052	.001*
EA _IA_ PEWB	.023	.005	.049	.036*
AV_IA_ PEWB	-.012	-.065	.024	.523
CVS_IA_ PEWB	.006	-.050	.066	.860
EV_IA_ PEWB	-.032	-.072	-.006	.039*
OCV_IA_ PEWB	.153	.087	.240	.001*
EAS_IA_ PEWB	.146	.083	.225	.001*
AEB_IA_ PEWB	.046	.018	.088	.006*
NI_IA_ PEWB	.017	-.010	.050	.300
External factors				
SF_IA_ PEWB	.068	.015	.145	.032*
ELB_IA_ PEWB	-.047	-.098	-.012	.018*
LS_IA_ PEWB	.053	.023	.094	.001*

Note. N = 856. *indicates significant estimates at $p < .05$. +indicates restricted variables. PN = Personal Norms; SN = Social Norms; PBC = Perceived Behavioral Control; EA = Environmental Awareness; AV = Altruistic Values; CVS = Conservative Values; EV = Enhancement Values; OCV = Openness to Change Values; EVS = Environmental Values; AEB = Attitudes Toward the Environment; NI = Need for Information; SF = Situational Factors; ELB = Exemplary Leader Behavior; LS = Leader Support; IA = Intention to Act.

5. DISCUSSION

This study explored the direct and mediated effects of internal and external factors on Pro-Environmental Behavior at Work (PEBW), with Intention to Act (IA) as a central mediating variable. The findings support a multidimensional approach, confirming that individual values, attitudes, and organizational dynamics are critical determinants of sustainable workplace behaviors.

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Building on previous research (Blok et al., 2015; Norton, 2016; Banwo & Du, 2019), this study found that Social Norms (SN), Personal Norms (PN), Environmental Awareness (EA), Environmental Values (EVS), Attitudes Toward the Environment (AEB), and Need for Information (NI) directly influence PEBW. Additionally, external factors such as Leader Support (LS) and Exemplary Leader Behavior (ELB) were also significant predictors, reinforcing the importance of organizational leadership in fostering sustainability. These results reinforce the relevance of both motivational and informational antecedents, aligning with previous studies (e.g., Andersson et al., 2012; Ruepert et al., 2016; Bertilsson & Remle, 2018).

Critically, Intention to Act (IA) emerged as a key mediator in the model, aligning with the Theory of Planned Behavior (Ajzen, 1991), which suggests that behavioral intentions are essential mediums through which attitudes and perceived control translate into action. Full mediation was observed for Perceived Behavioral Control (PBC) and Situational Factors (SF), while partial mediation occurred for Environmental Awareness (EA), Attitudes Toward the Environment (AEB), and Environmental Values (EVS). These findings indicate that even when environmental awareness and contextual support are present, behavioral intention remains essential to activating pro-environmental behavior in the work place.

An intriguing finding was the inverse direct effect of Enhancement Values (EV) on PEBW, despite their positive indirect influence via IA. This duality may reflect a conflict between self-enhancing values and collective organizational goals, consistent with Stern's (2000) Value-Belief-Norm Theory. The positive influence of Openness to Change Values (OCV) through IA further underscore the role of autonomy and innovation in driving sustainable behaviors within organizations.

The role of leadership was also reinforced, with Exemplary Leader Behavior (ELB) and Leader Support (LS) influencing both IA and PEWB directly. This indicates that leadership behaviors not only inspire pro-environmental intentions but also facilitate actual sustainable practices, supporting the importance of managerial commitment to environmental initiatives (Fatoki, 2019; Graves et al., 2019; Paillé & Boiral, 2013).

Unlike the original study by Blok et al. (2015), which utilized regression analysis, this research applied structural equation modeling (SEM), offering a more nuanced examination of direct and indirect relationships. The inclusion of underexplored predictors such as NI, EVS, and OCV within the Latin American context enriches the understanding of sustainability in diverse organizational environments, emphasizing the value of context-sensitive frameworks for studying PEWB.

Taken together, these findings reinforce that employee agency, supported by structural and informational interventions, is fundamental for advancing sustainability in the workplace (Bissing-Olson et al., 2013; Norton et al., 2014).

From a theoretical perspective, this study provides empirical support for the mediating role IA and highlights the value of integrating internal values, contextual leadership variables, and behavioral intentions when examining PEBW. While partially validating the Theory of Planned Behavior, the findings also underscore the need for broader frameworks such as the Norm Activation Theory (Schwartz, 1977, 1994), Cognitive Processing Theory (Kollmuss & Agyeman, 2002), and the Value-Belief-Norm Theory (Stern et al., 1999, Stern, 2000) to capture the complexity of environmental behavior in diverse organizational settings.

5.1 Practical implications and theoretical contributions

From a practical perspective, this study offers several insights:

Strengthening Behavioral Intentions: Organizations should design interventions to reinforce employees' intention to act pro-environmentally by aligning internal values with institutional support mechanisms. This includes providing regular training, promoting environmental awareness, and facilitating access to green infrastructure.

Role of Leadership: Visible and supportive leadership is essential for fostering sustainability. Managers should model pro-environmental behaviors and actively encourage participation in sustainability initiatives. Incorporating environmental stewardship into leadership development programs may amplify these efforts.

Value-Based Human Resource Practices: Identifying values such as openness to change and environmental values as predictors of PEWB highlights the need to integrate value-based components into HR practices, including recruitment, evaluation, and reward systems that recognize pro-environmental behaviors.

From a theoretical standpoint, this study contributes to the refinement of the Theory of Planned Behavior by demonstrating the mediating role of Intention to Act across a broader set of predictors. Furthermore, the results support the relevance of the Value-Belief-Norm framework for capturing the interplay between values, intentions, and behaviors in organizational contexts; as well as, highlight the importance of integrating multiple behavioral theories to adequately capture the complexity of environmental behavior in organizational settings.

Overall, this research enhances understanding of how internal motivations and organizational contexts interact to promote sustainable workplace behavior, particularly in underrepresented regions such as Latin America, offering insights applicable to other emerging economies facing similar challenges.

5.2 Limitations

Although this research provides valuable insights into the determinants of Pro-Environmental Behavior at Work (PEBW), several limitations should be considered.

First, the use of a cross-sectional design limits the ability to draw causal inferences. Longitudinal studies would be more effective in capturing changes in employee behavior over time and determining causality.

Second, data were collected using self-reported instruments, which may be subject to social desirability bias. Participants might have overreported their engagement in pro-environmental behavior, potentially skewing the results. Future research could benefit from incorporating observational or supervisor-reported measures to triangulate findings.

Third, the study focused solely on organizations in the Huila Department of Colombia. While this region provides an important context for understanding environmental behavior in Latin America, the findings may not be generalizable to other regions or countries with different cultural, institutional, or economic dynamics.

Finally, some variables showed small effect sizes in indirect pathways, raising the possibility of spurious relationships. Further studies should validate these associations using larger and more diverse samples, and explore additional moderators or mediators such as organizational culture or green identity that may influence PEBW.

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6. CONCLUSIONS

This study examined the direct and indirect effects of internal and external employee factors on Pro-Environmental Behavior at Work (PEBW), using a predictive model based on the framework proposed by Blok et al. (2015) and extended with elements from the Theory of Planned Behavior, Norm Activation Theory, and the Value-Belief-Norm Theory.

The results confirmed that Social Norms (SN), Leader Support (LS), and Intention to Act (IA) significantly and directly influence PEBW. Additionally, other internal factors such as Personal Norms (PN), Environmental Awareness (EA), Environmental Values (EVS and EV), Attitudes Toward Environmental Behavior (AEB), and Information Need (NI); and the external factor Exemplary Leadership Behavior (ELB) emerged as significant direct predictors, especially within the Huila region organizational context.

Intention to Act (IA) also played a mediating role in the model, fully mediating the effects of Perceived Behavioral Control (PBC) and Openness to Change Values (OCV), and partially mediating the effects of EV, AEB, Situational Factors (SF), and ELB on PEBW. These findings reinforce the conceptualization of IA as a critical mechanism through which both personal and contextual conditions are translated into sustainable workplace behaviors.

Given the multifactorial nature of PEBW, the results suggest that classical frameworks such as the Theory of Planned Behavior or the Norm Activation Theory may not sufficiently capture the complexity of environmental behaviors in organizational settings, particularly in sociocultural contexts where sustainability practices are still developing. The inclusion of underexplored variables, such as OCV and EV, and the application of Structural Equation Modeling (SEM), allowed for a more refined and integrative analysis of these dynamics.

In conclusion, this research advances the field of pro-environmental workplace behavior by providing empirical evidence from a Latin American context using rigorous SEM analysis. It confirms the central role of intention to act (IA) in translating internal and external drivers into sustainable behaviors, offering theoretical refinement and practical guidance for organizations aiming to foster environmental sustainability, particularly within emerging economies.

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Author contributions

Conceptualization, W. S.-B. and A. L. M.-B.; Methodology, A. L. M.-B. and W. S.-B.; Software, W. S.-B. and A. L. M.-B.; Data acquisition, W. S.-B.; Analysis and interpretation, A. L. M.-B. and W. S.-B.; Writing- Preparation of the draft, W. S.-B. and A. L. M.-B.; Writing-Revision & Editing, W. S.-B. and A. L. M.-B. All authors read and agree with the published version of the manuscript.

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