

Article

Investigating the Mediating Role of Environmental Attitudes in Shaping Pro-Environmental Behavior

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Abstract

Drawing on the Value–Attitude–Behavior framework, this study aims to investigate the relationship between environmental values and pro-environmental behavior and the mediating role of environmental attitudes in this relationship among Generation Z in India. Survey data were gathered using a structured questionnaire from 281 respondents, and statistical analysis for this study was conducted using SmartPLS 4.0 software. The Partial Least Squares Structural Equation Modeling (PLS-SEM) algorithm and bootstrapping technique were employed to analyze both the direct and mediation relationships. Path coefficients and *t*-values were thoroughly examined to validate and support the proposed hypotheses, ensuring robust testing of the model's structure and relationships. The study establishes a significant association between environmental attitudes and values, highlighting their positive role in promoting pro-environmental behavior, supporting the VAB theory. A partial mediation paradigm, in which environmental behavior is related to both cognitive (attitude) and motivational (value) factors, is supported by the significance of both direct and indirect effects. Multiple variables are highlighted by research on pro-environmental behavior (PEB), ranging from social and contextual factors to individual values and attitudes. While prior studies have sought to address this multiplicity, such efforts have often led to increased complexity rather than conceptual clarity. By isolating the variables, this research furthers the understanding of how environmental values and attitudes is related to pro-environmental actions in the context of the Indian Gen Z audience. The outcome of the study has important implications for green communication targeting this specific cohort.

Keywords: pro-environmental behavior; environmental values; environmental attitudes; attitude–behavior gap; sustainability



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1. Introduction

People are increasingly worried about the sustainability of the planet. The individual and societal value systems are being rethought, new attitudes are being formed, and a greater willingness to change behavior is being displayed. Identifying the determinants of pro-environmental behavior (PEB) is a key focus area in environmental psychology and sustainability-related research [1,2]. As environmental challenges continue to escalate globally, identifying factors that encourage individuals to adopt behaviors constructive to the environment has become increasingly important.

The association between values, attitudes, and pro-environmental behavior is a significant area of study, as these internal factors are often associated with individuals' willingness

to engage in environmentally sustainable actions [3]. Research in this area examines how ecological values, attitudes toward the environment, and actual pro-environmental behaviors interact, and to what extent values, attitudes, and behaviors are interrelated [4–7]. Therefore, it is essential to understand how PEB is conceptualized to contextualize the study of values and attitudes within a broader theoretical framework. It is crucial to define terms before looking at their determinants since different academics have used different phrases—such as ecological behavior or environmentally important conduct—to display behaviors meant to reduce human effect on the environment.

Pro-environmental behavior (PEB) is also referred to as environmentally significant behavior [8] or ecological behavior, defined as the behavior regarding ecology that consciously seeks to minimize the negative impact of human actions on nature and build the environment [9].

PEB is a diverse construct; while some studies adopt a unidimensional approach, others attempt to categorize it into different types or subdivisions [10]. The most comprehensive classification is provided by Stern (2000) [8], categorizing environmentally significant behavior into public-sphere behavior, which includes environmental activism, and non-activist behavior. The second category is private-sphere environmentalism, which mainly emphasizes green consumerism.

Actual behavior change is complex; effective behavioral change requires a careful selection of critical behaviors, examining its antecedent constructs, and using interventions to change relevant behaviors [11–13]. Research has identified different ways to engage people in more PEB, such as creating incentives, punishment, providing feedback and communication [14,15].

The antecedent factors may interact and also differ in their impact on specific PEB [8]. For example, attitudinal antecedents may impact behaviors that are easy to perform; there may be a higher variance for behaviors that are difficult or expensive to undertake. However, there seems to be a consensus among researchers about the categories of determinants. Broadly, they are classified into psychological, socio-demographic, and contextual factors [8,16–18].

An attempt to analyze all influencing factors of pro-environmental behavior increases the complexity of the study. The current study focuses on selected variables of environmental values, and environmental attitudes as the determinants for empirical observation of pro-environmental behavior [6,19–21].

Despite increasing research highlighting the importance of internal factors like values and attitudes in shaping pro-environmental behavior (PEB), a persistent gap remains between what individuals say their environmental values are and their actual engagement in sustainable actions [22–27]. Additionally, the potential mediating role of environmental attitudes in linking environmental values to pro-environmental behavior has received limited empirical focus, especially across different populations and types of behavior [24,28,29]. Furthermore, much of the research has been conducted within specific groups or locations and on particular behaviors such as recycling and green purchasing. The ability to generalize these findings to other populations and a wider range of pro-environmental actions remains uncertain [3,23,30]. In this context, it would be beneficial to extend the understanding of the relationship between environmental values, attitudes, and behavior (both conservation and green buying) from the perspective of the consumers in India.

Therefore, this study aims to address these gaps by (1) examining the link between environmental values and pro-environmental behavior, and (2) exploring whether environmental attitudes mediate how environmental values is linked to pro-environmental behavior among young adults (Gen Z) in India. By clarifying these relationships, the

research seeks to enhance understanding of the processes that promote or hinder turning environmental concern into tangible pro-environmental actions in this specific context.

The value-attitude-behavior (VAB) hierarchy proposed by Homer & Kahle (1988) follows the sequence: values are associated with attitudes, which are in turn associated with behavior [31,32]. The VAB provides a robust framework for understanding interconnecting relationships, as it has been empirically tested using structural equation modeling in consumer contexts [33]. It is well-cited in environmental psychology and is ideal for exploring value-attitude-behavior associations, in comparison to other models such as Ajzen's Theory of Planned Behavior (TPB) and Stern's Value-Belief-Norm Theory (VBN), as it also clarifies mediation [34]. The norm activation theory by Schwartz suggests that a person's behavior is an attempt to be consistent with their internalized values. Therefore, stimulating a person's internal values results in the formation of an attitude toward something or someone, which is then expressed through an action [35]. Building on this premise, the study uses the value-attitude-behavior framework to examine if environmental values are associated with pro-environmental behavior and whether environmental attitude mediates this relationship.

2. Literature Review

2.1. Pro-Environmental Behavior (PEB)

Pro-environmental behavior (PEB) is defined as behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world (e.g., minimize resource and energy consumption, use of non-toxic substances and reduce waste production) [18]. PEB is also referred to as environmentally significant or responsible behaviors, conservation behaviors, and environmentally sustainable behaviors [1,10,36].

Previous research on PEB covers various types of behaviors, including categorization into public and private sphere actions [8,36,37], environmental protection behavior intention (EPBI), green purchasing behavior intention (GPBI) [38], recycling [20], and green consumption or purchase [21,39,40].

Numerous theories and behavioral decision-making models developed over the years have contributed to the knowledge of the factors and processes influencing PEB. One of the earliest is Lewin's Field theory, which proposed internal (attitudes, values, and knowledge) and external (an individual's physical and social environment) variables that influence human behavior. Since then, the norm-activation model, the frequently applied theory of planned behavior, and the more recent VBN theory have coexisted [37,41,42], helping researchers understand the reasons behind people's environmental behavior.

Few theories and models attempt to provide the underlying factors that explain the formation of PEB; researchers largely use Azjen's Theory of Planned Behavior (TPB) to explain PEB. The core components of subjective norms perceived behavioral control and specifically attitude in varying degrees correlate to environmentally significant behavior [20,43]. The other influential model that has its roots in environmentalism is presented by Stern as a part of his value-belief-norm (VBN) theory, listing four types of antecedent variables that researchers have used to correlate with different types of PEB: attitudinal factors, external or contextual forces; and personal capabilities and habits [5,44].

The most prominent factors identified in previous studies have been categorized as (a) internal: environmental knowledge, environmental attitudes, pro-environmental values, green identity, personal norms, emotional attachment, and (b) external: social norms, contextual factors, marketing of sustainable lifestyle [17]. Some studies focus on individual environmental-related variables such as environmental concern and willingness to contribute [19]; environmental attitude, green identity, social norms, and environmental knowledge [37]. Demographic factors such as age and gender [45] also have a considerable

impact on PEB. An individual is a part of the larger society and is largely influenced by her orbit of influence; factors such as social norms [40] and cultural values [46] have also been considered as determinants in the previous literature.

The ecological behavior of Indians, like that of their global counterparts, is influenced by environmental beliefs and attitudes [47]. For price-sensitive Indian consumers, the intention to pay a premium and perceived value of eco-friendly products are important factors influencing PEB [48].

India is not only one of the fastest-growing economies but also has a rapidly growing population which results in environmental problems with global impact. While fulfilling their personal needs is essential to the Indian consumer, conservation of the environment has also become a concern [5]. Green buying, considered a part of ethical consumption, has received much marketing and academic attention in the developed nations and is gaining its foothold in India as well. The research related to this area in India, however, is few and far between [48–50]. In this research endeavor, pro-environmental behavior is operationalized through individuals' purchasing and consumption decisions like including preference for refillable and green-labelled products, products with minimal packaging, and products made from recycled materials, as well as avoidance of environmentally harmful products.

2.2. Environmental Values (EV)

Values are an individual's core beliefs about what is important. Values are responsible for shaping our internal motivation which in turn, influences behavior, in this case, PEB [6,23]. Prior studies that examine environmental behavior because of values build on the theory proposed by Schwartz with modifications to fit environmental issues [12]. In his VBN theory, Stern presents values as the basis of environmentalism. He proposes five variables that encourage environmentally significant behavior, the prominent one being altruistic values. With increasing numbers of green consumers, green consumption values—exploring environmental protection through one's consumption behavior—are gaining significance, affecting attitudes and trust towards green marketing communication [21,51]. Environmental values are operationalized as an individual's concern for the intrinsic value of the natural world; in other words, values that emphasize harmony between man and nature. Hence, it is proposed that:

H1. *Environmental value (EV) has a significant positive association with pro-environmental behavior (PEB).*

The VBN theory proposes a framework to hypothesize the effect of environmental values on environmental attitudes. According to this theory, three different value orientations guide individual attitudes: concern for the natural environment—biospheric, interest in the well-being of all human beings—altruistic, and self-interest—egoistic values [35].

Biospheric value has been reported as an important factor associated with environmental attitudes and behavioral intentions [29,52]. This helps expand our understanding of how values influence certain attitudes and, in turn, affect behavior.

H2. *Environmental value (EV) has a significant positive association with environmental attitude (EA).*

2.3. Environmental Attitude (EA)

Attitudes are long-term or persistent feelings about a person, object, or subject, responsible for an individual's behavior. Environmental attitude is the importance an individual

places on environmental protection and their perception of responsibility [35,40]. Attitude has been consistently associated with pro-environmental behavioral intentions [30,49,53].

Attitude is also a key variable for behavioral change in the TPB framework, proven to have an indirect impact on behavior, via its influence on behavioral intentions [43]. Certain PEB behaviors are more influenced by attitudes than others [20]; public sphere PEB, such as signing a petition or taking part in a demonstration, is more influenced by attitudes [37]. Recent studies focus on green attitudes driving green consumption [21,41,50]. EA is operationalized as the importance an individual places on environmental protection and his/her perception of the responsibility towards environment.

H3. *Environmental attitude (EA) has a significant positive association with pro-environmental behavior (PEB).*

VBN theory places environmental attitude as one of the key determinants of sustainable behavior. Despite an observed gap between attitude and sustainable consumption [17,22,25,26] and limited focus on the mediating role of environmental attitude across populations [24,28]. Research substantiates that environmental attitudes interact with ecological values and pro-environment behavior [4–6].

H4: *Environmental attitude (EA) mediates the relationship between environmental value (EV) and pro-environmental behavior (PEB).*

The conceptual model for this study (Figure 1) proposes that environmental value has a positive association with pro-environmental behavior through the presence of the mediating variable, environmental attitude. The model suggests that environmental values are expected to be positively associated with environmental attitudes. This conceptual framework visually presents the proposed connections among variables and provides the foundation for hypothesis formulation along with empirical testing in the study.

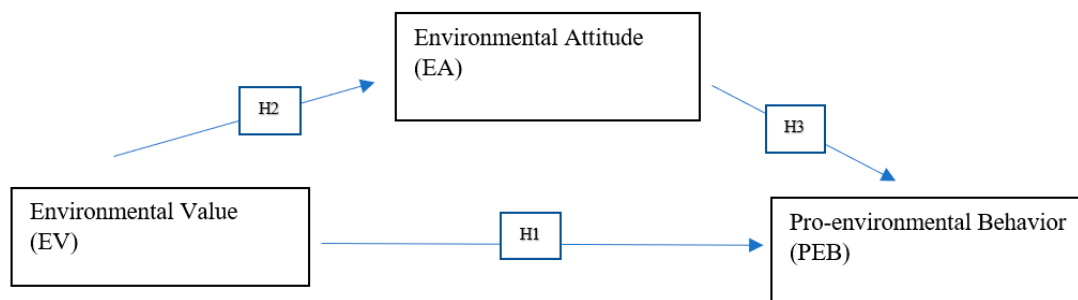


Figure 1. Conceptual model.

3. Method

3.1. Study Design

This study utilizes a quantitative approach and employs a cross-sectional research design. The investigation is structured to examine the relationships among the independent variable, environmental value, the dependent variable, pro-environmental behavior, and the mediating variable, environmental attitude, as outlined in the conceptual framework. The study's methodology is designed to identify and measure the strength and direction of associations between the variables, providing a comprehensive understanding of their interplay as hypothesized in the research framework.

The quantitative data is gathered from Gen Z using a structured questionnaire with closed-ended questions. Generation Z includes those born between 1997 and 2012; this classification by the independent research agency Pew Research Center is widely recognized by

the global scientific community [45]. According to EY's analysis of World Bank Population Projections and Estimates data for 2020, India has a predominantly young population, with 27% of the total population being Gen Z [54]. The generation-specific approach adopted in the study focuses on the cohort labelled the green generation, which shows increased concern about environmental issues compared to preceding generations (Gen X and Millennials) [51,55]. Accelerated digital connectivity and exposure to pro-environmental content on social media have aided Gen Z's growing engagement in adopting a sustainable lifestyle as well as influencing the future direction of the environmental narrative [5,56,57]. To reach this group, the study focused on undergraduate and postgraduate university students across multiple disciplines in Manipal, a diverse, multicultural student town with broad representation from all states in India. The inclusion criterion was students aged from 18 to 25 years, pursuing their undergraduate and post-graduate studies from different disciplines. The exclusion criterion was students aged outside this age bracket.

The study adopted a convenience sampling method. Participants were provided the details of the project, explaining the objective and nature of the study, after which written consent was obtained from them to participate in the survey. On obtaining consent, they were also briefed on the confidentiality of the data collected from them assured them that participation was voluntary. This rigorous approach to consent not only ensured compliance with ethical norms but also fostered transparency and trust with participants. The questionnaire was administered via Google Forms and WhatsApp was used to share the link to eligible respondents who met the screening criteria. The data collection spanned 3 weeks, during which 281 students completed the survey. Participants were assured that the collected data would be used for research purposes and that the data would be sufficiently de-identified. The sample size was generated by multiplying the number of elements on the rating scale by ten ($14 \times 10 = 140$) [58]. Considering 10% of the unanswered sample (i.e., 14), the required sample size was set at 154. Sample size adequacy was further assessed using GPower 3.1 with an F-test for multiple regression, consistent with the recommendation by [58] to avoid the '10-times rule'. Using a medium effect size ($f^2 = 0.15$), alpha of 0.05, target power of 0.80, and two exogenous constructs (the maximum pointing to a single endogenous construct), the minimum required sample size was $N = 68$. The study's sample of $N = 281$ substantially exceeds this threshold, yielding an achieved power of 100%, confirming the sample is more than adequate for the analysis. A total of 300 respondents were approached for participation in the study. However, only 281 completed responses were included in the final analysis.

3.2. Measurements

A pretest of 40 participants was conducted. The pilot study results depicted strong reliability and validity values through Cronbach's alpha and AVE. Face validity was checked to ensure items were appropriate. Content validity of the items was carried out in consultation with 12 subject experts from corporate communications, specializing in sustainability communication, and academic and media professionals working in science and environment-related issues. The assessment rubric for the items included relevance, appropriateness, and clarity. The minor suggestions given by the expert panel were incorporated, followed by the data collection for the main study.

Data for this study were collected using a structured questionnaire. All items were measured on a five-point Likert scale. The questionnaire comprised of 17 items in total, including 3 items pertaining to participants' demographic information and 14 items assessing the study's key constructs. Pro-environmental behavior was measured as the dependent variable using a scale adapted from [9], which demonstrated high internal consistency (Cronbach's alpha = 0.91). The independent variable, environmental value, was assessed

using a scale adapted from [59], with a Cronbach's alpha of 0.84. Environmental attitude served as the mediating variable and was measured using a scale adapted from [60], with a Cronbach's alpha of 0.80.

4. Results

Structural equation modeling was used to study the measurement model, and structural model analysis was used to evaluate the suggested links in order to determine the validity and reliability of the components. Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected due to its suitability for analyzing complex models involving multiple variables. In recent years, structural equation modeling, particularly PLS, has been more popular [61–65].

The final sample exceeded the minimum amount recommended for PLS-SEM, with 281 valid respondents. Samples bigger than the sufficient, for identifying medium to large effect sizes in PLS-SEM analysis with good statistical power, per recommendations [66,67]. Consequently, it was determined that 281 was an adequate sample size to ensure the model's validity and stability. The Smart-PLS 4.0.1.3 application was used to both create and evaluate the model [68].

As seen in Table 1, of the 281 respondents to the online survey, 59% were female. Moreover, 75% of respondents were currently pursuing graduation, whereas 58% of the responses were received from a cohort of a metropolitan city.

Table 1. Demographic characteristics.

Demographic Characteristic	Percentage
Male	40%
Female	59%
Other	1%
Currently pursuing graduation	75%
Currently pursuing post-graduation	25%
Metropolitan city	58%
Non-metro city/town	42%

Measurement items from earlier established studies were utilized to evaluate each construct as shown in Table 2. The constructs employed around 3 to 5 items from validated sources. To measure the constructs, a 5-point Likert scale, with 1 denoting “strongly disagree” and 5 denoting “strongly agree,” was used.

Table 2. Sources of Scale.

Sr. No.	Construct	Source
1	EA	[60]
2	EV	[59]
3	PEB	[9]

Prior to the online survey's introduction, a number of actions were made to increase the questionnaire's face validity. Face validity for the items was also carried out with the help of 12 experts, followed by the data collection for the main study. These professionals evaluated if the questions addressed the targeted ideas in a clear and logical manner and whether they were in line with the research objectives. This stage assisted in identifying

any phrasing or language errors that would cause participants to become confused or misunderstand the questions. The survey was launched after the necessary adjustments were made in response to this feedback, guaranteeing that the questions were not only clear but also likely to elicit significant answers in the study context.

Before doing hypothesis testing, we confirmed total collinearity in accordance with [69] recommendations. This is an important step to reduce common method bias (CMB) when employing factors from the same dataset. Low multicollinearity among the latent components was found using the VIF test; values ranged from 1.108 to 1.516 (Table 3), all of which were significantly below the 3.3 threshold [69].

Table 3. VIF test.

Item	VIF
EA 1	1.186
EA 2	1.203
EA 3	1.166
EA 4	1.171
EA 5	1.108
EV 1	1.507
EV 2	1.453
EV 3	1.316
EV 4	1.383
PEB 1	1.341
PEB 2	1.445
PEB 4	1.438
PEB 5	1.516

5. Assessment of Measurement Model

5.1. Convergent Validity

The average variance extracted (AVE) for all constructs exceeded the recommended threshold of 0.50. Cronbach's alpha and the CR indices both exceeded the anticipated minimum of 0.7 [70], except for EA (Table 4).

Table 4. Reliability and validity measures.

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
EA	0.587	0.587	0.751	0.554
EV	0.739	0.763	0.833	0.556
PEB	0.739	0.760	0.835	0.559

Environmental Attitude (EA) was retained despite its Cronbach's alpha (0.587) being below the conventional 0.70 threshold. However, the construct demonstrated acceptable convergent validity (AVE = 0.554) and composite reliability (CR = 0.751). This method is in line with Hair et al. (2021) [66] suggestions, especially when using exploratory models or culturally complex situations where scale sensitivity may differ. Based on previous research and face validity pilot testing, the measuring items were kept. To enhance transparency, the outer loadings of all measurement items are reported. All retained indicators exhibited

loadings above the recommended threshold of 0.70, confirming reliability and validity. Item PEB3 exhibited a loading of 0.602 and was, therefore, removed to improve convergent validity and internal consistency of the construct (Table 5).

Table 5. Outer loadings.

Construct	Item	Loading	Status
EA	EA1	0.728	Retained
EA	EA2	0.749	Retained
EA	EA3	0.790	Retained
EA	EA4	0.732	Retained
EA	EA5	0.720	Retained
EV	EV1	0.751	Retained
EV	EV2	0.792	Retained
EV	EV3	0.748	Retained
EV	EV4	0.784	Retained
PEB	PEB1	0.708	Retained
PEB	PEB2	0.725	Retained
PEB	PEB3	0.602	Removed
PEB	PEB4	0.736	Retained
PEB	PEB5	0.816	Retained

5.2. Discriminant Validity

The Heterotrait–Monotrait Ratio (HTMT) was used to evaluate discriminant validity. The distinctness of the constructs was established when all HTMT values dropped below the 0.85 criterion (Table 6).

Table 6. HTMT matrix.

	EA	EV	PEB
EA			
EV	0.690		
PEB	0.733	0.585	

Heterotrait–Monotrait Ratios

In addition to this, cross loadings have also been measured (Table 7). Each indicator loaded highest on its respective construct compared to other constructs, thereby confirming discriminant validity.

Table 7. Cross loadings.

	EA	EV	PEB
EA 1	0.728	0.300	0.314
EA 2	0.749	0.219	0.341
EA 3	0.790	0.223	0.291
EA 4	0.732	0.324	0.305
EA 5	0.720	0.377	0.260

Table 7. Cont.

	EA	EV	PEB
EV 1	0.285	0.751	0.314
EV 2	0.426	0.792	0.388
EV 3	0.267	0.748	0.210
EV 4	0.403	0.784	0.424
PEB 1	0.374	0.311	0.708
PEB 2	0.289	0.293	0.725
PEB 4	0.344	0.283	0.736
PEB 5	0.436	0.464	0.816

6. Assessment of Structural Model

The structural model was assessed using a number of metrics, such as effect sizes (f^2), path coefficients with corresponding t - and p -values, SRMR value, and coefficient of determination (R^2) (Figure 2).

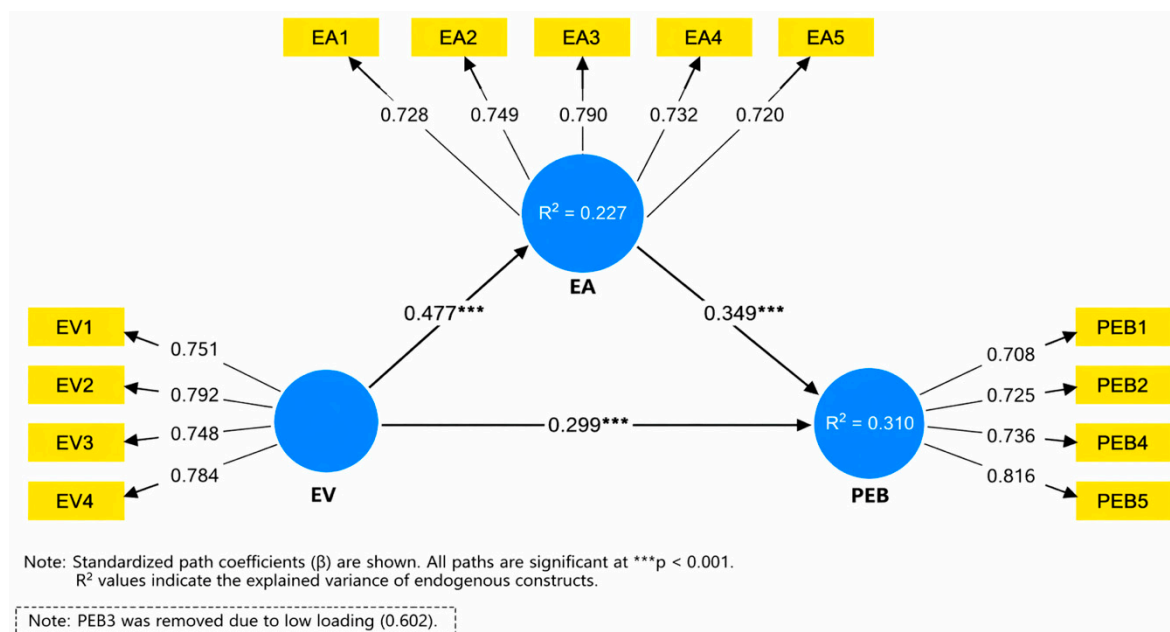


Figure 2. Structural model.

The PLS-SEM model's approximation model fit criterion was the Standardized Root Mean Square Residual (SRMR). The SRMR value was 0.092. This value falls below the threshold of 0.10 and may, therefore, be considered indicative of an acceptable model fit [71]. The SRMR value of 0.092 falls below the more liberal threshold of 0.10 and may be considered indicative of an acceptable fit. However, it exceeds the more conservative threshold of 0.08 and should, therefore, be interpreted with caution in the context of PLS-SEM.

6.1. R^2 Values

The adjusted R^2 and R^2 values show how much of the variance in the dependent variables can be explained by each of the corresponding exogenous constructs (Table 8). In behavioral research contexts, R^2 values of 0.25, 0.50, and 0.75 are regarded as weak, moderate, and considerable, respectively [66].

Table 8. R-square values.

Construct	R-Square	R-Square Adjusted
EA	0.227	0.225
PEB	0.310	0.305

Environmental Attitude (EA): Adjusted $R^2 = 0.225$, $R^2 = 0.227$:

This indicates that Environmental Values (EV) account for 22.7% of the variance in EA. Even while this degree of explanatory power is poor to moderate, it nevertheless shows that individual environmental values have a significant association with the development of environmental attitudes, particularly in social science models where high R^2 is not necessarily anticipated.

PEB: $R^2 = 0.310$, Adjusted $R^2 = 0.305$:

This shows that EA and EV together account for 31% of the variance in PEB. This is regarded as a comparatively moderate level of prediction, indicating that a reasonable basis for interpreting environmentally conscious behaviors is provided by the combination of attitude and values. Model stability and little overfitting are demonstrated by the strong relationship between R^2 and adjusted R^2 .

6.2. F^2 Scores

Cohen's (1988) f^2 effect size was computed to evaluate the individual contribution of each exogenous construct to the endogenous variables to supplement the interpretation of path coefficients and R^2 values [72]. This shows how much a certain exogenous construct, when included in the model, adds to the R^2 value of a dependent construct.

The magnitude of the effect size was interpreted using the following thresholds:

- $f^2 \geq 0.02$ = small effect
- $f^2 \geq 0.15$ = medium effect
- $f^2 \geq 0.35$ = large effect (Hair et al., 2021) [66]

Any values of f^2 above 0.35 are deemed critical, while those above 0.02 are considered acceptable (Table 9).

Table 9. f-square.

Path	f-Square
EA → PEB	0.136
EV → EA	0.294
EV → PEB	0.100

EV → EA ($f^2 = 0.294$):

The effect size for EV → EA ($f^2 = 0.294$) indicates a medium effect size, suggesting that environmental values are meaningfully associated with environmental attitudes. According to the value–attitude–behavior hierarchy frequently referenced in environmental psychology literature, this validates the theoretical premise that firmly held values serve as a basis for forming attitudes.

EA → PEB ($f^2 = 0.136$):

The effect size for EA → PEB ($f^2 = 0.136$) may be interpreted as small-to-moderate and approaches the conventional threshold for a medium effect. This suggests that environmental attitudes are meaningfully associated with pro-environmental behavior.

EV → PEB ($f^2 = 0.100$):

The effect size for $EV \rightarrow PEB$ ($f^2 = 0.100$) indicates a small-to-moderate effect size, suggesting a modest direct association between environmental values and pro-environmental behavior. Taken together, the effect-size results are consistent with the pattern of associations proposed by the Value–Attitude–Behavior framework. However, the magnitude of the observed effects should be interpreted as modest, particularly for the paths involving pro-environmental behavior.

6.3. Path Coefficients

All of the proposed direct pathways (H1–H3) are supported by the model as statistically significant at $p < 0.001$ (Table 10). To explore the mediating role of EA in the link between EV and PEB, the indirect effect was investigated (H4) (Table 11).

Table 10. Direct relationships.

Factor	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ($ O/STDEV $)	p Values
EA $\rightarrow$ PEB	0.349	0.356	0.062	5.658	<0.001
EV $\rightarrow$ EA	0.477	0.482	0.052	9.240	<0.001
EV $\rightarrow$ PEB	0.299	0.298	0.062	4.829	<0.001

Table 11. Mediation analysis.

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ($ O/STDEV $)	p Values	BI
EV $\rightarrow$ EA $\rightarrow$ PEB	0.166	0.172	0.038	4.347	$p < 0.001$	0.101, 0.250
VAF%	35.77%					

6.3.1. Direct Effects

EV $\rightarrow$ PEB (H1): EV also had a significant direct effect on PEB ($\beta = 0.299$, $t = 4.829$, $p < 0.001$), indicating that values show direct association with behavior beyond attitude.

EV $\rightarrow$ EA (H2): A strong and substantial effect was shown by the path coefficient, which was $\beta = 0.477$, $t = 9.240$, and $p < 0.001$. This suggests an association between positive environmental views and environmental values.

EA $\rightarrow$ PEB (H3): Pro-environmental behavior is significantly favorable association to environmental attitudes, as seen by the path coefficient of $\beta = 0.349$, $t = 5.658$, and $p < 0.001$.

6.3.2. Mediation Analysis

A bootstrapping approach with 5000 subsamples was used to assess the mediating function of EA in the connection between EV and PEB.

A statistically significant mediating pathway was indicated by the particular indirect relationship of EV $\rightarrow$ EA $\rightarrow$ PEB, which was beta equal to 0.166. This is an example of partial mediation since the direct path from EV to PEB ($\beta = 0.299$, $p < 0.001$) remained significant in addition to the indirect path ($\beta = 0.166$, $p < 0.001$) [73]. This implies that attitudes have a direct and indirect relationship with behavior due to environmental values and are linked to environmental actions, providing support to the value–attitude–behavior (VAB) framework. Environmental attitude accounted for approximately 35.7% of the total association between environmental values and pro-environmental behavior, indicating partial mediation. The Variance Accounted For (VAF) was 35.77%, indicating that approximately 35.77% of the total association between Environmental Values (EV) and Pro-Environmental Behavior (PEB) was represented by the indirect pathway through Environmental Attitude (EA). Consistent with [58], this finding supports partial mediation.

6.4. Hypothesis Analysis

Pro-environmental behavior (PEB) and environmental attitudes (EA) are both strongly associated with environmental values (EV), as demonstrated by H1 and H2. The value–attitude–behavior (VAB) model’s attitudinal pathway is strengthened by H3, which demonstrates that environmental attitude has a positive influence on conduct. The considerable indirect effect shown by H4 suggests that EA mediates the link between EV and PEB to some extent (Table 12).

Table 12. Hypothesis analysis.

Hypothesis	T Statistics	<i>p</i> Values	Decision
H1: EV → PEB	4.829	<i>p</i> < 0.001	Supported
H2: EV → EA	9.240	<i>p</i> < 0.001	Supported
H3: EA → PEB	5.658	<i>p</i> < 0.001	Supported
H4: EV → EA → PEB	4.347	<i>p</i> < 0.001	Supported

These results support the VAB theory by highlighting the fact that internalized environmental values are positively related to attitudes in addition to directly correlating with action. A partial mediation paradigm, in which environmental behavior is associated with both cognitive (attitude) and motivational (value) factors, is supported by the significance of both direct and indirect effects.

7. Discussion

The study expands our understanding of the connection between environmental value and pro-environmental behavior, as well as the mediating role of environmental attitude in this relationship for the specific Indian Gen Z population. All three paths are statistically significant (with *p* < 0.001), indicating strong and reliable relationships. The paths from Environmental Value (EV) to Environmental Attitude (EA) and from EA to pro-environmental behavior (PEB) are strong, with high T statistics (9.240 and 5.658, respectively). The evidence aligns with the theoretical framework of the value–attitude–behavior hierarchy [31], where values are positively associated with attitudes, which in turn promote specific behavior [4–6,32].

Empirical evidence from the study supports the hypothesis that environmental value has a positive association with the environmental attitude of individuals (H2) and is consistent with prior research findings [29,35,52]. The determinants of environmentally significant behavior are both external and internal, with prior research highlighting environmental attitude as a key factor in influencing PEB [17,37,47]. The observed patterns validate the correlation between environmental attitude and the subsequent pro-environmental behavior, providing support to H3. This evidence corresponds with the existing literature on attitude as a significant of pro-environmental behavior in certain contexts [30,41,49].

The results of this study find the path from EV to PEB to be significant, supporting H1 but slightly weaker (T statistic = 4.829), signifying that while the effect is positive, it is not as strong as the other relationships. This reinforces prior conclusions on the value–behavior gap, where individuals’ expressed environmental values don’t exactly translate to sustainable behavior [22–27].

The analysis also enhances the understanding of environmental attitude as the mediating variable between EV and PEB. A statistically significant mediating pathway (T statistic = 4.347) suggests that environmental attitudes are related to behavior directly, as well as indirectly through environmental values, thus supporting H4. The research concludes that both environmental values and attitudes have a significant positive association

with the pro-environmental behavior within the studied Indian Gen Z cohort. The R^2 values obtained in the current empirical work presents a modest but meaningful explanatory power, suggesting that the proposed model explains the meaningful proportion of variance in the endogenous construct. In behavioral and social science research, such level of variance is acceptable as human behavior is complex and multidimensional. This implies that other psychological, social, and environmental factors could contribute to pro-environmental behavior, that are presently not captured in the study. Hence, this lays a significant foundation for future researchers to explore.

Grounding the findings within Homer and Kahle's Value–Attitude–Behavior model, this study provides empirical support for the hierarchical sequence linking values, attitudes, and behavior in the environmental context. Environmental values are positively associated with environmental attitudes, which is a significant antecedent of pro-environmental behavior, thus supporting that the mediating role of attitudes may help explain the association between values and reported behavior. Environmental values are significantly associated with pro-environmental behavior, indicating a possibility that individuals whose value system supports a pro-environmental stance are more likely to respond proactively towards ecological issues. The weaker strength of the relationship, however, suggests a definite gap in values and action, positing that value alone does not translate consistently into act strengthening environmental values and attitudes may be associated with greater pro-environmental behavior for this specific demographic cohort.

For the studied Gen Z respondents in India, the link between values and shaping attitude, and subsequently, how attitudes influence behavior, indicates a coherent validation for explaining the associative pathway towards pro-environmental behavior and the applicability of the VAB framework. The study contributes to a better understanding of this response pathway or sequence of associations. It adds to the growing body of research exploring sustainability-related views and behaviors among Gen Z, a demographic cohort positioned as highly engaged in environmental and social issues. The findings emphasize the importance of value orientation in understanding the environmentally conscious behavior among this particular demographic within the context of increasing climate discourse. The results also indicate that the environmental attitude may act as an important link between values and behavior, aligning with the prior literature.

The observed associations offer preliminary insights for brands interested in sustainability communication and green marketing. The findings suggest the possibility that value-based sustainability communication may resonate with Gen Z consumers, although communication effectiveness was not directly measured in this study. Customizing communication around the brand's environmental values and connecting them to personal values and attitudes may prove to be persuasive in capturing Gen Z's attention and nudging them towards eco-friendly behavior.

The findings may be useful in informing future research in environmental policy initiatives; policymakers and advocacy groups seeking to encourage Gen Z towards specific behavioral outcomes (e.g., reducing, reusing, recycling), there is a possibility to leverage the behavior–attitude congruence by developing early education programs to inculcate pro-environment attitudes for a stronger engagement and address the attitude–action gap.

The findings of this study highlight the importance of strengthening environmental values and attitudes to encourage pro environmental behavior. Since environmental values were explored in influencing behavior both directly and indirectly, through environmental attitude, policymakers and educational institutions should focus on nurturing these values from early stage. The findings may provide preliminary insights for policymakers interested in environmental education initiatives. Policy makers should incorporate content to be delivered to students which strengthen the environmental values in the form of community

activities in the curriculum. This could further develop deeper sense of ownership of environmental responsibility and promote sustainable behavior practice. In addition, policy intervention could be aimed at promoting environmentally responsible behavior beyond 'cognitive' to action-oriented behavioral change. Collaborative efforts of all stakeholders will further nurture this behavioral change in the long run.

8. Limitations and Directions for Future Research

Further research can be conducted to examine other factors influencing PEB, such as environmental knowledge, emotions, contextual factors, such as price sensitivity and willingness to pay, and marketing of sustainable lifestyles, to gain a comprehensive understanding of what drives ecological behavior among Gen Z. Qualitative exploration may uncover deeper insights to understand the reasons and solutions for overcoming the value-action gap and the attitude-behavior gap.

Although the study contributes to the existing literature, its scope and generalizability are limited by specific constraints. The sample size of the study may restrict broad predictions related to the Indian Gen Z students. The adoption of convenience sampling technique, a non-probability sampling approach, serves as a limitation and paves way for future researchers to adopt mixed method sampling approach to further strengthen generalizability.

An inherent limitation lies in the sample being skewed in terms of socio-economic representation, which may influence the generalizability of the findings. The study relies on self-reported behavior and not observed or actual behavior; this limits the assessment of actual impact of pro-environmental behavior. The cross-sectional, self-reported nature of the data necessitates that the findings be interpreted as associative rather than predictive. Additionally, future research can consider studying different generational cohorts, such as Indian Millennials, to understand the differences in environmental values and attitudes, and their pro-environmental behavior. An experimental approach could be adopted undertake a causal research approach.

Although Environmental Attitude demonstrated acceptable composite reliability and convergent validity, its Cronbach's alpha was below the conventional threshold. Therefore, findings involving the mediating role of environmental attitude should be interpreted with appropriate caution and validated in future studies using alternative measurement instruments.

9. Conclusions

The findings offer preliminary insights for sustainability communication initiatives aimed at Generation Z by highlighting the role of environmental values and attitudes in shaping pro-environmental behavior. These results may assist practitioners in developing communication strategies that incorporate value-driven and attitude-based sustainability messages. The study also contributes to the growing body of research examining psychological antecedents of pro-environmental behavior within the context of emerging economies. Future research may examine whether the observed associations extend to educational institutions, workplaces, and other organizational settings. Researchers may also explore potential differences across demographic, cultural, and geographic groups to better understand the generalizability of these relationships. Additionally, future studies could investigate the effectiveness of different sustainability messaging approaches, communication channels, and engagement strategies in fostering pro-environmental attitudes and behaviors. Longitudinal and experimental research designs may further help clarify the stability of these relationships over time and the causal mechanisms through which values and attitudes influence sustainable behavior.

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