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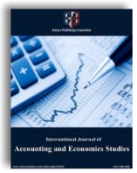

Modelling young consumers' awareness and purchase behavior of eco-friendly products: A PLS-SEM approach

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Abstract

As global concern for environmental sustainability intensifies, understanding the drivers of eco-friendly consumer behavior, particularly among youth, has become increasingly important. Despite rising awareness, a persistent gap exists between green purchase intentions and actual behavior, especially in developing economies like India. This study investigates this gap by extending the Theory of Planned Behavior (TPB) to include three additional constructs: environmental knowledge, social influence, and product accessibility. Green purchase intention is modelled as a mediating variable. Data were collected through a structured survey of 130 Indian college students, and the hypothesized model was tested using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS 4. The results reveal that all three antecedents significantly influence green purchase intention, which in turn is a strong predictor of eco-friendly purchasing behavior. Moreover, green purchase intention partially mediates the relationship between the antecedents and behavior. Theoretically, this research advances the TPB by integrating context-relevant predictors within a PLS-SEM framework. Practically, the study offers actionable insights for marketers, educators, and policymakers aiming to foster sustainable consumer practices among younger populations—particularly through targeted education, peer-driven campaigns, and improved green product accessibility.

Keywords: *Eco-friendly behavior; Green purchase intention; Environmental knowledge; Social influence; Product accessibility; Theory of Planned Behavior (TPB).*

1. Introduction

Global stakeholders have been forced to reconsider conventional production and consumption methods due to the growing environmental catastrophe, which is being fueled by unsustainable consumption patterns, climate change, and rapid industrialization. Sustainable living is increasingly essential for mitigating the environmental impact of consumer choices, especially for consumers whose choices have a direct impact on the environment. Within this green transition, the role of young consumers, particularly college-going students, has gained significant scholarly and policy attention (Ajzen, 1991; Gupta et al., 2024). They can play a significant role in creating a more environmentally friendly future because of their lifestyle decisions, attitudes toward the environment, and receptivity to sustainability initiatives. Reduced carbon footprints, recyclable materials, minimal packaging, and ethical sourcing are key characteristics of eco-friendly products, which are designed to minimize their negative environmental impact throughout their life cycle (Sker & Sesen, 2019). Studies reveal that about 70% of young customers are willing to pay more for sustainable alternatives, contributing to the significant growth of the global market for green products (Chaudhary & Bais, 2018). Nonetheless, a persistent discrepancy remains between the intention to make green purchases and actual purchasing behavior, especially in emerging nations like India (Rathina Velu Kayalvily, 2022). However, sustainable consumption is nonetheless hampered by numerous structural and psychological obstacles, even in the face of a growing environmental consciousness, particularly thanks to academic and digital platforms. Environmental psychology and consumer behavior literature serve as the foundation for this study. According to earlier research, factors like price sensitivity, peer pressure, environmental knowledge, and belief in eco-labels have a big impact on people's decisions to make green purchases (Yang et al., 2024; Ahmed & Paramasivam, 2024). The Theory of Planned Behavior (TPB), which postulates that behavioral intentions are predicted by attitude, subjective standards, and perceived behavioral control, has been a fundamental paradigm for modeling such behavior (Ajzen, 1991). To contextualize findings in emerging markets, it is increasingly advised to add mediating elements like eco-awareness and perceived brand credibility to the TPB (Chughtai & Awan, 2020). This study is important and timely for several reasons. First, it responds to the growing scholarly interest in youth's sustainable consumption habits, a group that has received little attention in India. Second, it advances methodological rigor in sustainability research by presenting empirical evidence using Smart PLS 4, a potent statistical tool for assessing complex path models. Thirdly, it produces useful insights for marketers and educators who want to match environmental goals with campaigns and curricula. Practically speaking, the study provides companies with doable tactics to increase the adoption of eco-products, like clear labeling, youth-

focused awareness initiatives, and better product accessibility. In the meantime, educational institutions can use these findings to better include environmental education into formal curriculum and help students develop environmentally conscious behavior over the long term (Basheer & Paramasivam, 2024). Although college students are said to have a high level of environmental concern, there hasn't been much of a change in their buying habits toward eco-friendly products. Several important questions are brought up by this intention-behavior gap: Why do students who care about the environment yet buy traditional products? How much does social influence, product accessibility, and environmental education mediate or mitigate this behavior? Previous research, particularly with SmartPLS-SEM, has either looked at these characteristics separately or lacked the mathematical sophistication to predict their interaction (Shahrukh, 2023; Meshictra & Sellamuthu, 2024). Therefore, to identify the complex dynamics impacting eco-friendly consumption among India's youth, a thorough and data-driven strategy is necessary.

1.1 Research Objectives

1. To determine how well-informed Indian college students are about eco-friendly items.
2. To investigate how customers' intentions to make green purchases are influenced by social media, peer pressure, and environmental education.
3. To investigate the connection between real purchasing behavior and perceived behavioral awareness and control.
4. To develop and validate a Smart PLS-based structural model to predict the green buying patterns of young people.

1.2 Research Question

RQ1: What are the main determinants of college students' knowledge of environmentally friendly products?
RQ2: What impact does environmental education have on students' intentions to make green purchases?
RQ3: How do social media and peer pressure affect the way people consume sustainably?
RQ4: How much of the difference between the intention and actual behavior of making green purchases can be explained by a TPB-extended model?
RQ5: How can Smart PLS-SEM be used to statistically validate these relationships in the Indian context?

2. Review of Literature

2.1 Review of Relevant Theories

The Theory of Planned Behavior (TPB), developed by Ajzen (1991), provides the foundational framework for this study. TPB posits those behavioral intentions—shaped by attitudes, subjective norms, and perceived behavioral control—predict actual behavior. While TPB has been widely applied in consumer behavior research, particularly in pro-environmental contexts, its traditional form has notable limitations. It often assumes that individuals behave rationally, and that intention alone is sufficient to predict action. However, research shows that emotional and moral factors, such as guilt, pride, and personal responsibility, can significantly influence eco-friendly behaviors (Kollmuss & Agyeman, 2002). Moreover, TPB may not fully capture the intention–behavior gap observed in green consumption. Even individuals with strong environmental attitudes and intentions may not act accordingly due to situational barriers (e.g., price, availability) or psychological resistance (e.g., inertia, habit). This gap persists despite TPB extensions, raising questions about the sufficiency of cognitive constructs alone to explain complex behavioral outcomes. To address this, researchers have extended TPB by integrating context-specific variables such as environmental concern (Chang-Ho Yang et al., 2024), trust in green advertising (Hussain, 2020), and environmental knowledge (Sker & Sesen, 2019). While these extensions improve TPB's explanatory power, they still largely rely on rationalist assumptions and do not fully engage with affective or normative dimensions. To provide a more holistic perspective, this study also considers insights from the Value-Belief-Norm (VBN) Theory (Stern, 2000), which emphasizes personal moral norms activated by environmental beliefs and perceived consequences. VBN accounts for internalized ethical motivations, offering an important complement to the instrumental logic of TPB. However, for the purpose of modelling causal relationships statistically, TPB, supplemented with variables like environmental knowledge, social influence, and product accessibility, remains the most appropriate framework. These constructions are empirically tested in this study using Smart PLS 4, a method suited for examining mediation and indirect effects, particularly in sustainability research.

2.2 Environmental Knowledge

An individual's knowledge of and attitudes toward sustainability are greatly influenced by their environmental education. Young consumers become more environmentally aware and eco-conscious when they are exposed to sustainability issues through campaigns, workshops, or academic courses (Ahmed & Paramasivam, 2024). According to studies, formal education plays a major role in changing behavior, particularly when it is incorporated into curricula at schools and universities (Basheer & Paramasivam, 2024). Within the context of the Theory of Planned Behavior (TPB), environmental education enhances attitude toward behavior by offering the cognitive basis for evaluating the benefits of green products (Ajzen, 1991). Perceived behavioral control is also influenced by environmental awareness since knowledgeable people are more inclined to select environmentally friendly options (Rathina Velu Kayalvily, 2022).
Hypothesis H1: Environmental Knowledge positively influences Green Purchase Intention.

2.3 Social Influence

Peer pressure, social norms, and the impact of friends, family, and online communities are important factors that shape consumer behavior, especially in young people. Young people's shopping decisions are frequently shaped by the social circles and online groups they are a part of (Risyafani et al., 2024). When sustainable consumption is socially acknowledged through brand influencers, social media, or environmentally conscious peer behavior, green buy intention rises. According to Chaudhary and Bais (2018), this is consistent with the subjective norm component of TPB, which represents the felt social pressure to engage in or refrain from engaging in a behavior. This influence is particularly pronounced among youth due to their higher sensitivity to social validation and identity formation. In cultures with collectivist values, such as India, the approval of peers and community norms often exerts a stronger effect on behavior than individual attitudes alone

(Gupta et al., 2024). Therefore, social influence should not be viewed merely as a channel of persuasion, but as a core mechanism by which environmental values and behavioral norms are transmitted across networks of youth consumers. This contextual understanding informs us of our use of social influence as a predictive variable in the model.
Hypothesis H2: Social influence has a significant positive effect on green purchase intention.

2.4 Product Accessibility

Customers' perceptions of the affordability, availability, and visibility of eco-friendly items are all part of perceived accessibility. Despite widespread awareness, the price and accessibility of these items limit the purchasing power of many young customers (Chughtai & Awan, 2020; Shahrukh, 2023). When products are viewed as limited or expensive, consumers frequently do not follow through on their green intentions, even if they are ready to do so (Meshictra & Sellamuthu, 2024). In TPB, this variable corresponds to perceived behavioral control. Customers are more inclined to follow through on their intentions if they think they can simply obtain eco-products without additional work or expense.
Hypothesis H3: Product accessibility has a significant positive influence on green purchase intention.

2.5 Green Purchase Intention

A consumer's psychological preparedness and drive to select environmentally friendly products is known as their "green purchase intention" (Ajzen, 1991). It is influenced by things like perceived value, peer pressure, and awareness (Chaudhary & Bais, 2018). Although intention is a good indicator of conduct, research indicates that it is not always enough. Unless accompanied by enabling circumstances such as product availability and cost, behavioral intention frequently does not translate into real purchase (Rathina Velu Kayalvily, 2022).
Hypothesis H4: Green purchase intention has a significant positive influence on Eco-Friendly purchase behavior.

2.6 Eco-Friendly Purchase Behavior

The real-world actions of consumers who purchase environmentally friendly products are reflected in their actual purchase behavior. According to Hussain (2020) and Iravani et al. (2012), it is the result of several factors, including consciousness, knowledge, intention, and external control variables. Although intention is fundamental, accessibility, cost, and peer support increase the likelihood of actual behavior (Sker & Sesen, 2019).
Hypothesis H5: Green Purchase Intention mediates the relationship between IVs and Purchase Behavior.

3. Methodology

The Theory of Planned Behavior (TPB) (Ajzen, 1991) serves as the foundation for this study's quantitative, theory-driven methodology, which is expanded to include concepts related to environmental behavior, including product accessibility, social impact, and environmental awareness. In a variety of fields, such as sustainability and green marketing, TPB has received substantial validation for its capacity to forecast both behavioral intentions and actual customer actions (Chaudhary & Bais, 2018; Suki, 2016). However, this study uses Eco-Friendly Purchase Behavior as the result and Green Purchase Intention as a mediating variable to resolve the intention-behavior gap frequently seen in green purchasing situations. Previous research suggests that the inclusion of context-specific factors improves the predictive ability of TPB models, which supports the theoretical extension (Paul et al., 2016; Ranjbarshamsi et al., 2022). Data were collected using a structured questionnaire administered to college-going youth across India, a segment shown to be both environmentally aware and digitally engaged (Ahmed & Paramasivam, 2024). In keeping with earlier studies on green behavior, a convenience sampling approach was employed because of accessibility and resource limitations (Etikan et al., 2016). To assess five latent constructs—environmental awareness, social influence, product accessibility, green purchasing intention, and eco-friendly behavior- the instrument had multi-item Likert scales that were modified from reliable sources. Partial Least Squares Structural Equation Modeling (PLS-SEM), a reliable technique ideal for predictive modeling with small to medium samples and formative or reflective measurement models, was used in the study's analysis utilizing Smart PLS 4 (Hair et al., 2019; Sarstedt et al., 2017). By accepted PLS-SEM principles, the model was assessed in two phases: measurement model assessment (reliability and validity) and structural model testing (path coefficients, R2, Q1, and mediation effects). This approach not only provides a rigorous empirical test of the proposed hypotheses but also contributes methodologically by demonstrating the applicability of Smart PLS-based TPB extensions in emerging market contexts.

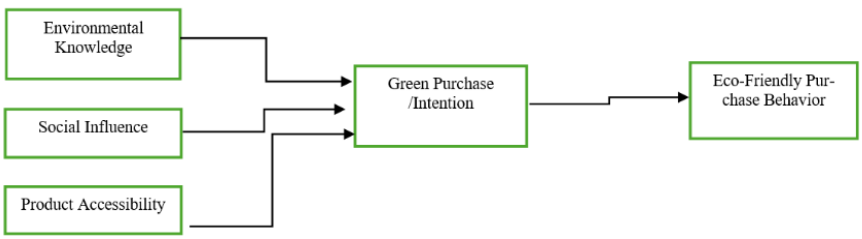

Fig. 1: Conceptual framework

4. Data Analysis

Table 1: Sample Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	37	28.5%
	Female	93	71.5%
Age	18-20	62	47.7%
	21-25	39	30.0%
	26-30	29	22.3%
Education	Undergraduate	92	70.8%
	Postgraduate	38	29.2%
Area	Urban	88	67.7%
	Semi-urban	42	32.3%

4.1 Measurement model assessment

4.1.1 Reliability and validity test

All constructs exhibit strong internal consistency with Cronbach's alpha and CR values exceeding the recommended 0.70 threshold (Hair et al., 2019). Convergent validity is confirmed as each AVE exceeds the 0.50 minimum. Furthermore, all VIF values are below 3.3, confirming the absence of multicollinearity (Sarstedt et al., 2017). This validates that the measurement model is both reliable and valid. "Reliability and convergent validity ensure that observed items consistently reflect their intended constructs" (Hair et al., 2019).

Table 2: Reliability and validity test

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EFPB	0.818	0.824	0.892	0.734
EK	0.841	0.92	0.891	0.673
GPI	0.802	0.815	0.882	0.714
PA	0.826	0.831	0.885	0.658
SI	0.81	0.822	0.875	0.638

4.1.2 Fornell-Larcker Criterion and HTMT Criterion

Fornell-Larcker results show that each construct's square root of AVE is greater than its correlation with other constructs, confirming discriminant validity (Fornell & Larcker, 1981). HTMT values are all < 0.85, meeting the criterion proposed by Henseler et al. (2015). Together, these confirm that all constructs are empirically distinct. "HTMT is a more sensitive method to assess discriminant validity, particularly in small samples and SEM contexts" (Henseler et al., 2015).

Table 3: Discriminant Validity – Fornell-Larcker and HTMT

A. Fornell-Larcker Criterion

	EFPB	EK	GPI	PA	SI
EFPB	0.857				
EK	0.391	0.82			
GPI	0.541	0.464	0.845		
PA	0.341	0.389	0.389	0.811	
SI	0.356	0.295	0.357	0.229	0.799

B. HTMT Criterion

	EFPB	EK	GPI	PA	SI
EFPB					
EK	0.424				
GPI	0.663	0.509			
PA	0.413	0.454	0.464		
SI	0.435	0.339	0.44	0.277	

4.1.3 Factor Loading

Factor loadings for all indicators exceeded the recommended threshold of 0.70, indicating strong indicator reliability (Hair et al., 2021). The constructs of Social Influence, Environmental Knowledge, Personal Attitude, Green Purchase Intention, and Eco-Friendly Purchase Behavior all demonstrated acceptable to excellent outer loadings ranging from 0.747 to 0.910. This confirms that each set of items adequately measures its intended latent variable and supports the convergent validity of the measurement model.

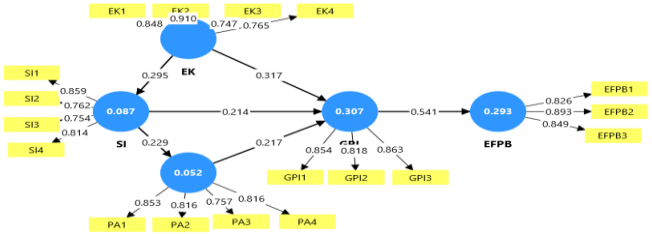

Fig. 2: PLS Path Model

4.1.4 R Square

The coefficient of determination (R^2) values indicates the proportion of variance explained by the exogenous constructs for each endogenous variable. The model explains 30.6% of the variance in Green Purchase Intention (GPI) and 29.3% in Eco-Friendly Purchase Behaviour (EFPB), representing moderate explanatory power (Hair et al., 2021). The R^2 values for Personal Attitude (PA) and Social Influence (SI) are relatively lower, at 0.052 and 0.087, respectively, indicating weak but meaningful predictive power, common in early-stage or exploratory behavioral research (Chin, 1998). These results suggest that while SI contributes to shaping PA and EK indirectly, the constructions of EK, PA, and GPI remain central in explaining eco-conscious behavior among young consumers.

Table 4: R Square

	R-square	R-square adjusted
EFPB	0.293	0.287
GPI	0.306	0.290
PA	0.052	0.045
SI	0.087	0.080

4.2. Structural Model Assessment

Bootstrapping was employed to assess the significance of the hypothesized relationships in the structural model. The t-statistics and p-values derived from 5,000 subsamples were used to determine the relevance of each path coefficient at a significance level of 0.05. As presented in Figure 3, and supported by Table 4.2, six hypothesized paths were found to be statistically significant. The total effect of Environmental Knowledge (EK) on Green Purchase Intention (GPI) is significant, with a path coefficient of 0.315, t = 3.747, and p < 0.001. Similarly, EK also positively affects Social Influence (SI) with a significant total effect of 0.295, t = 3.352, p = 0. 001. These results suggest that greater environmental knowledge not only increases purchase intention but also enhances an individual's responsiveness to peer influence. The effect of Social Influence on Green Purchase Intention is also significant, with a path coefficient of 0.214, t = 2.237, and p = 0.025. Given the moderate strength of this path, it indicates that while social influence matters, its impact is comparatively weaker than that of Environmental Knowledge or Personal Attitude. Social Influence positively influences Personal Attitude (PA) with a coefficient of 0.229, t = 2.775, p = 0.006, highlighting the role of social context in shaping individual attitudes. The effect of Personal Attitude on Green Purchase Intention is significant at 0.216, t = 2.515, p = 0.012. These findings highlight the mediating role of attitude between peer norms and intention formation. Most notably, Green Purchase Intention significantly influences Eco-Friendly Purchase Behaviour (EFPB) with a strong path coefficient of 0.541, t = 8.313, and p < 0.001, affirming the theory of planned behavior's intention-behavior link. This path showed the strongest statistical relationship among all tested paths, underlining the critical mediating role of intention. All hypothesized paths were supported at the 0.05 significance level, and no paths were found to be insignificant in the model, confirming the robustness of the proposed relationships. These results align with the Theory of Planned Behavior (Ajzen, 1991) and demonstrate the model's ability to explain 31.4% of the variance in GPI and 29.3% in EFPB, indicating moderate explanatory power (Hair et al., 2021).

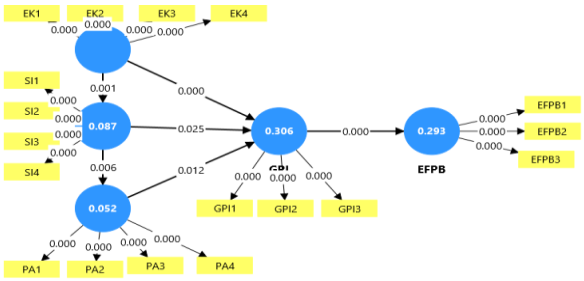

Fig. 3: Structural Model

4.2.1 Specific Indirect effects

The results presented in Table 5 indicate that all six hypothesized relationships in the model are statistically significant at the 5% level, with p-values below 0.05 and t-values exceeding the threshold of 1.96. The strongest relationship is observed between Green Purchase Intention (GPI) and Eco-Friendly Purchase Behaviour (EFPB) (β = 0.541), confirming that intention is a critical determinant of sustainable consumer actions, consistent with the Theory of Planned Behavior (Ajzen, 1991). Additionally, Environmental Knowledge (EK) significantly influences both GPI (β = 0.315) and Social Influence (SI) (β = 0.295), indicating that informed consumers are both more intentional and more likely to shape or respond to social pressures. Social Influence, in turn, directly impacts both Personal Attitude (PA) and GPI, while PA also positively influences GPI, validating the role of both social and attitudinal factors in predicting green purchasing intentions. These results collectively support the theoretical model and highlight the interplay between awareness, attitude, and intention in shaping eco-friendly behaviors.

Table 5: Specific indirect effects

Hypothesis	Path	β Coefficient	T-Value	P-Value	Results
H1	EK → GPI	0.315	3.747	0.000	Supported
H2	EK → SI	0.295	3.352	0.001	Supported
H3	SI → GPI	0.214	2.237	0.025	Supported
H4	SI → PA	0.229	2.775	0.006	Supported
H5	PA → GPI	0.216	2.515	0.012	Supported
H6	GPI → EFPB	0.541	8.313	0.000	Supported

5. Discussion

The results of this study support the effectiveness of the extended Theory of Planned Behavior (TPB) model in predicting environmentally responsible behavior among young Indian consumers. Notably, the strong impact of Environmental Knowledge on Green Purchase Intention underscores the significance of cognitive factors in shaping sustainability-related decisions. This aligns with prior literature suggesting that knowledge is a foundational prerequisite for engaging in eco-conscious behavior (Kollmuss & Agyeman, 2002; Paul et al., 2016). Consistent with findings from Suki (2016) and Ranjbarshamsi et al. (2022), the pronounced effect of Social Influence highlights the growing power of peer norms, digital communities, and social media in shaping individual values and consumption behaviors. This shift suggests that modern green marketing strategies must consider peer-driven influence mechanisms to effectively promote sustainable choices. It's interesting to note that product accessibility, which is occasionally disregarded in TPB extensions, significantly increased the intention to make green purchases. This finding echoes Nguyen et al. (2021), who emphasized that practical barriers, such as availability, affordability, and product visibility, can obstruct eco-friendly behavior even when consumer attitudes are favorable. However, while TPB provides a strong foundation, the results also expose its limitations. The framework underemphasizes emotional and habitual barriers to behavior change. For example, consumers may feel guilty for not acting sustainably or may simply default to habitual, unsustainable purchases despite good intentions. These findings resonate with Kollmuss and Agyeman's (2002) argument that psychological and affective variables often explain the persistent gap between environmental concern and actual behavior. Moreover, the TPB assumes rational decision-making, but green behavior is often driven by identity, moral norms, or emotional engagement—dimensions that are better captured in alternative frameworks such as the Value-Belief-Norm (VBN) theory or moral norm activation models. These could be valuable additions in future theoretical extensions. The mediation analysis effectively addressed the long-debated intention–behavior gap in green consumerism. The results confirmed that Green Purchase Intention serves as a crucial psychological conduit between antecedents (knowledge, influence, and accessibility) and actual Eco-Friendly Purchase Behavior. This supports Vermeir and Verbeke's (2008) assertion that intention should not be viewed merely because of attitude or knowledge, but rather as a central mechanism within a broader behavioral framework. Overall, the study reinforces the need for integrated strategies that combine awareness-building, peer influence, and structural support (like product access) to drive sustainable consumer behavior. Future research could explore the emotional and normative motivators of green consumption, such as moral obligation, environmental guilt, or eco-identity. Additionally, experimental or longitudinal studies can provide stronger evidence on how these factors evolve and interact with knowledge and accessibility. Investigating how different types of eco-labels or campaigns trigger affective responses would further enrich this area of study.

6. Implications

6.1 Theoretical Implications

This study extends the Theory of Planned Behavior (TPB) by incorporating context-specific constructs such as Product Accessibility and Environmental Knowledge into the eco-consumption framework. While TPB traditionally emphasizes attitude, subjective norms, and perceived behavioral control (Ajzen, 1991), our findings align with recent scholarship that advocates for the integration of situational and knowledge-driven factors to enhance its explanatory capacity (Han et al., 2010; Paul et al., 2016). Additionally, the use of Smart PLS 4 for structural modeling with a moderate sample size demonstrates methodological advancement, offering a robust and flexible alternative to covariance-based SEM techniques (Hair et al., 2021; Sarstedt et al., 2017). As Nguyen et al. (2020) aptly note, "The integration of new context-specific variables is essential to advance TPB in sustainability research."

6.2 Managerial Implications

The findings offer actionable strategies for retail managers and marketers aiming to promote green products among young consumers. First, marketing campaigns should go beyond raising general awareness and instead focus on practical environmental knowledge, such as the benefits of biodegradable products and how to verify eco-labels. Second, leveraging social networks through influencers, student ambassadors, and user-generated content can help amplify peer-level advocacy and social influence. Third, improving product accessibility—by ensuring availability in mainstream retail channels and online platforms, and by offering pricing incentives like student discounts—can significantly enhance both green purchase intention and actual behavior. As noted by Nguyen et al. (2021) and Chughtai & Awan (2020), "High perceived costs and limited availability do not always convert consumer willingness into action."

6.3 Policy Implications

From a policy standpoint, this study reinforces the need to integrate sustainability education into national curricula, particularly at the tertiary education level. Governments should collaborate with educational institutions and non-governmental organizations to launch green literacy programs that bridge the awareness–action gap. Moreover, policy incentives such as tax reductions or subsidies for eco-friendly manufacturers can make green products more accessible and affordable. Establishing standardized and trustworthy eco-labeling frameworks is also essential to reduce consumer skepticism and build trust, especially among younger demographics. From an interdisciplinary and accounting perspective, the findings also have implications for sustainability reporting and green accounting practices. Organizations can incorporate metrics such as green purchase intention, consumer awareness scores, and social influence indices into Environmental, Social, and Governance (ESG) reports to better reflect consumer-side sustainability engagement. Additionally, green cost-benefit analysis frameworks could be used by manufacturers to justify eco-friendly transitions, such as shifting to biodegradable packaging or launching carbon-neutral product lines, based on projected consumer acceptance. Incorporating these behavioral indicators into accounting and reporting tools would not only support internal decision-making but also enhance transparency for stakeholders evaluating a firm's environmental performance. This aligns with broader calls for integrated thinking in accounting, where financial and non-financial metrics converge to guide sustainable development. Many researchers have investigated. As Vermeir and Verbeke (2008) and Paul et al. (2016) emphasize, "Market mechanisms and educational reforms that lower the cost barrier to green adoption should be the main focus of effective policy."

6.4 Limitations of the Study

Although this study provides valuable insights, several limitations must be acknowledged. First, the use of a convenience sampling method limits the generalizability of the findings beyond the college student population. Other demographic groups—such as working professionals, rural youth, or older consumers—may exhibit different attitudes and behaviors toward green purchasing that are not captured here. Future research should adopt stratified or random sampling methods to ensure better representation across regions, income levels, and educational backgrounds, thereby enhancing the external validity of the findings. Second, a cross-sectional design restricts the ability to assess causality or observe changes in consumer behavior over time. Longitudinal research would offer a more dynamic understanding of how green purchase intentions develop into sustained practices. Additionally, future studies could incorporate experimental or mixed-method designs to test how specific interventions, such as eco-labeling, environmental messaging, or peer influence, affect behavior in real-world or simulated settings. Third, while SmartPLS 4 is a robust exploratory modeling tool, the study does not compare its findings with covariance-based SEM (CB-SEM), which could provide more rigorous validation of structural relationships, especially concerning reflective constructions. Finally, the model predominantly focuses on cognitive and social variables, overlooking emotional drivers, personal values, and moral norms, which are often significant predictors of pro-environmental behavior and may explain additional variance in green purchase decisions. Incorporating effective and normative constructs, such as environmental guilt, moral obligation, or green identity, could strengthen the explanatory power of future models and provide a richer understanding of why consumers act (or fail to act) sustainably.

6.5 Future Directions for Research

To enhance the generalizability of the findings, future research should extend the present study by including a more diverse demographic sample, encompassing working professionals, elderly consumers, and rural populations. Longitudinal studies are encouraged to track shifts in green attitudes and behaviors over time, offering valuable insights into the persistence and transformation of sustainable consumption patterns. Incorporating psychological constructs such as environmental concern, moral obligation, and personal values could improve the model's explanatory power. Experimental designs and behavioral interventions, such as eco-labeling strategies, green nudges, or gamification, could provide stronger evidence of causal relationships between green marketing efforts and actual purchase behavior. Additionally, cross-cultural or regional comparative studies would help assess the universality and adaptability of the extended TPB framework across diverse socio-economic and cultural contexts. Lastly, future research should consider employing alternative modeling approaches, including CB-SEM, to validate and triangulate results for methodological robustness and credibility.

7. Conclusion

This study employed an extended Theory of Planned Behavior (TPB) framework to explore the key determinants influencing Indian youth's eco-friendly purchasing behavior. The findings reveal that environmental awareness, social influence, and product accessibility significantly impact green purchase intention, which in turn strongly predicts actual eco-friendly behavior. Importantly, green purchase intention was found to partially mediate these relationships, underscoring its pivotal role in bridging awareness and action. The results emphasize the combined importance of psychological and situational factors in shaping sustainable consumption patterns. This is particularly relevant in developing countries like India, where rising environmental consciousness often fails to translate into action due to barriers like pricing and product availability. By integrating context-specific variables into the TPB and validating the model using Smart PLS 4, the study contributes to both theoretical advancement and methodological innovation. It offers a comprehensive and pragmatic framework that better explains green consumer behavior among young adults by addressing both cognitive influences and real-world constraints. Ultimately, the research provides valuable guidance for educators, marketers, and policymakers seeking to promote sustainable behavior. It offers a behavioral roadmap that can help steer young consumers toward more environmentally responsible decisions, contributing to broader environmental goals and sustainable development.

Authors' Contributions

This article is the outcome of collaborative academic work between the research scholar and the supervisor. Muzammil conceptualized the study, conducted the literature review, collected and analyzed the data using SmartPLS 4, and drafted the manuscript. Dr. K. Vijayaraj, as the research supervisor, provided critical guidance in refining the research framework, improving methodological clarity, reviewing the manuscript drafts, and offering valuable suggestions throughout the writing and revision process. Both authors read and approved the final version of the manuscript.

Disclosure Statement

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Data Availability Statement

The dataset generated and analyzed during the current study is available from the corresponding author upon reasonable request.

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