

“From awareness to action: The role of green consumer identity, marketing signals, and perceived greenwashing in sustainable consumption”

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FROM AWARENESS TO ACTION: THE ROLE OF GREEN CONSUMER IDENTITY, MARKETING SIGNALS, AND PERCEIVED GREENWASHING IN SUSTAINABLE CONSUMPTION

Abstract

Growing concern over environmental degradation and increasing skepticism toward corporate sustainability claims has heightened interest in how consumers form sustainable consumption decisions in emerging markets. This study examines how internal sustainability orientations and firms' green marketing practices jointly shape sustainable consumer behavior, and how perceived greenwashing moderates these relationships among Generation Y and adult Generation Z consumers in Vietnam.

Using survey data from 656 urban consumers, the study applies regression, sequential mediation, and moderation analyses. The results show that green consumer identity is the strongest driver of sustainable behavior, with environmental awareness and environmental protection attitude operating indirectly through identity formation. Green purchase willingness serves as a proximal mechanism linking identity to behavior. Green marketing practices have weaker but significant effects, indicating a complementary role alongside internal motivations.

Perceived greenwashing weakens the translation of both identity-based motivation and marketing signals into behavior, but does not affect willingness formation, suggesting a stage-specific credibility effect at the behavioral conversion stage.

The findings highlight an integrated mechanism in which identity-based motivation dominates, external signals complement, and perceived authenticity constrains sustainable consumption in emerging markets.

Keywords

sustainable consumer behavior, green consumer identity,
green marketing, perceived greenwashing, Vietnam

JEL Classification

D12, D91, Q56

INTRODUCTION

Climate change and environmental degradation pose mounting threats to global ecosystems, driven largely by unsustainable production and consumption patterns. Household consumption alone accounts for nearly two-thirds of global greenhouse gas emissions (Ivanova et al., 2020), underscoring the critical role of individual behavioral choices in shaping environmental outcomes. Despite international efforts such as the United Nations Sustainable Development Goal 12 on responsible consumption and production, progress remains limited, and the behavioral drivers of sustainable consumption are not yet fully understood (Glavič, 2021; Sasaki, 2025).

Existing research on sustainable consumer behavior has examined both organizational-level signals, such as green marketing practices, and individual-level orientations, including environmental awareness, attitudes, and green consumer identity, as key antecedents of pro-en-

vironmental behavior (Joshi & Rahman, 2015; Liobikienė & Bernatoniene, 2017; White et al., 2019). However, these factors are often studied in isolation. The sequential mechanisms through which individual orientations develop into green identity and translate into purchase willingness and sustainable behavior remain underexplored (Piramanayagam et al., 2023; Zeng et al., 2023). Rising concerns about greenwashing further introduce a credibility-reducing condition that may disrupt how organizational signals and identity-based motivations convert into sustainable behavior (Delmas & Burbano, 2011; Lyon & Montgomery, 2015). This moderating dynamic has received limited empirical attention in integrated frameworks.

Generation Y (aged 29 - <45) and adult Generation Z (aged 18 - <29) represent a particularly relevant consumer segment for examining these dynamics. Having grown up amid rapid technological development and widespread environmental discourse, these cohorts demonstrate comparatively stronger environmental awareness and higher expectations for corporate sustainability than older generations (Sethuraman et al., 2023; Urbain et al., 2013). As their purchasing power continues to expand, understanding what drives their sustainable consumption decisions and what conditions may undermine those drivers carries both theoretical and practical significance.

This gap is especially pronounced in emerging economies such as Vietnam, where rapid market growth and increasing green marketing activity coincide with heightened consumer skepticism toward corporate environmental claims (Nguyen et al., 2016; Testa et al., 2015). In this context, the interplay between individual sustainability orientations, organizational green marketing efforts, and perceived greenwashing among younger consumers warrants systematic empirical investigation.

Against this background, the present study addresses two research questions: (i) how do internal sustainability orientations and external green marketing practices shape sustainable consumption behavior among Generation Y and adult Generation Z consumers in Vietnam, and what roles do green consumer identity and green purchase willingness play in this process? (ii) how does perceived greenwashing weaken the effectiveness of identity-based and marketing-based drivers of sustainable consumption behavior?

1. LITERATURE REVIEW

1.1. Sustainable consumption decision-making: internal orientations and external signals

Sustainable Consumer Behavior (SCB) refers to consumers' efforts to reduce environmental and social harm through purchasing and post-purchasing decisions, including choosing environmentally friendly products, reducing waste, recycling, saving energy, and supporting responsible firms (White et al., 2019). Since SCB covers multiple forms of action and decision-making, it is usually recognized as a multi-faceted behavioral outcome rather than as the result of a single determinant (Liu et al., 2017; Reppmann et al., 2025). Prior research explains sustainable consumption through both internal consumer-level factors and external market-level influences (Jaiswal & Kant,

2018; White et al., 2019). Internally, consumers' understanding of environmental conditions, their attitudes toward environmental issues, and the internalization of such understanding and concern provide psychological foundations for sustainable action (Zhao et al., 2025). Externally, one of the most visible ways consumers encounter sustainability is through green marketing practices, which communicate environmental value through products, packaging, labels, pricing, and promotional messages (Cuc et al., 2022; Mahmoud et al., 2022; Majeed et al., 2022).

Although internal consumer factors and external market-level influences have both been widely examined, they are often treated separately or as parallel predictors of sustainable behavior (Piramanayagam et al., 2023; Zeng et al., 2023). Given the multi-faceted nature of SCB, consumers do not make sustainable decisions based sole-

ly on internal values or corporate signals; rather, their behavior reflects the interplay between internal orientations, purchase-related willingness, and external market cues (Habib et al., 2025; Reppmann et al., 2025). In this respect, single-domain approaches may provide an incomplete explanation of how sustainable consumption decisions are formed. This limitation becomes more pronounced in sustainability markets, where consumers frequently rely on organizational claims that are difficult to verify and may be affected by perceived greenwashing (Li et al., 2025; Lyon & Montgomery, 2015). Therefore, an integrated model that accounts for internal consumer foundations, external green marketing signals, and perceived credibility offers a more appropriate basis for explaining SCB.

1.2. Internal sustainability orientation: from environmental awareness to green identity

Compared with conventional products, green alternatives often require consumers to pay a higher price for benefits that are not always immediate, visible, or personally utilitarian (Mahmoud et al., 2022; Shang et al., 2023). Much of their value lies in intrinsic, environmental, or collective outcomes, such as reducing ecological harm or supporting responsible production (Shang et al., 2023). As a result, green products may be less compelling to consumers who evaluate purchases mainly through price, convenience, or functional performance. Consumers who respond positively to such products are therefore more likely to be driven by internal motivations (Reppmann et al., 2025). For this reason, sustainable consumption requires attention to the internal orientations that make consumers willing to consider green alternatives despite their weaker immediate rewards.

Awareness of environmental issues (AEI) provides the cognitive foundation for consumers' willingness to opt for green products (Ogiemwonyi et al., 2023). It reflects consumers' recognition of environmental problems, such as climate change, pollution, resource depletion, and the ecological consequences of unsustainable consumption (IPCC, 2023; Whitmore-Williams et al., 2021). When consumers become more aware of these problems, they are more likely to recognize their con-

sequences, appreciate the environmental role and value of green products, and connect everyday consumption with broader environmental outcomes (Ogiemwonyi et al., 2023). In this sense, environmental awareness makes the environmental relevance of consumption more visible while providing the cognitive basis from which sustainable consumption orientation can develop (Truong & Lan, 2025).

However, awareness alone does not fully explain sustainable behavior, as a well-documented attitude-behavior gap persists between recognition and action (Reppmann et al., 2025). Environmental Protection Attitude (EPA) complements this cognitive foundation by capturing consumers' evaluative orientation toward environmental issues (Kaur et al., 2022). While awareness concerns what consumers recognize about environmental problems, EPA concerns the extent to which they evaluate environmental protection as important, desirable, and worth considering in consumption decisions (Zhao et al., 2025). A favorable environmental attitude can make sustainability more relevant to how consumers judge products, firms, and everyday consumption choices, even before it becomes part of their self-identity (Kaur et al., 2022; Sharkasi et al., 2025). Together, AEI and EPA provide two complementary internal foundations for sustainable consumption: AEI makes consumers aware of the environmental consequences of consumption, while EPA gives those consequences evaluative weight in decision-making (Ogiemwonyi et al., 2023). When consumers recognize environmental problems and hold a strong orientation toward protecting the environment, green products become more worthwhile and sustainable behavior becomes a more justified response to those problems.

A stronger internal mechanism emerges when awareness and attitude become incorporated into the consumer's self-concept. Green Consumer Identity (GCI) refers to the extent to which consumers perceive environmental responsibility as part of who they are (Gravelines et al., 2022). Identity-based perspectives suggest that consumers are more likely to act consistently when a behavior aligns with their self-definition and valued identity (Oyserman, 2009). Accordingly, consumers who are aware of environmental issues and

strongly value environmental protection are more likely to regard environmental responsibility as personally relevant and incorporate it into how they define themselves as green consumers (Ishaq et al., 2025). Through this process, environmental understanding and favorable environmental evaluations, which are captured by AEI and EPA, become integrated into consumers' self-definition, resulting in a stronger green consumer identity. In sustainable consumption contexts, consumers with a strong green consumer identity are more likely to translate their identity into consistent green consumption intentions, which subsequently guide environmentally responsible purchasing and broader sustainable consumption behavior (Liao et al., 2026).

1.3. External sustainability signals: green marketing practices

Although internal orientations provide psychological foundations for sustainable consumption, consumers still need external cues to identify and evaluate green alternatives in the marketplace (Spence, 1978). Many environmental attributes are not directly observable before purchase, and consumers may find it difficult to assess whether a product, brand, or firm is genuinely sustainable (Liao et al., 2026). Green Marketing Practices (GMP), defined as firms' efforts to design, price, promote, and communicate products or services in ways that emphasize environmental value, function as market-facing signals that make sustainability more visible and interpretable to consumers (Gazzola et al., 2017).

GMP includes practices such as environmentally friendly product design, sustainable packaging, eco-labeling, green pricing, and promotional messages emphasizing environmental responsibility (Mahmoud et al., 2022; Tan et al., 2025). These practices represent one of the most visible external influences consumers can encounter and rely on to evaluate products, brands, and purchase options (Liao et al., 2026). When concrete and consistent, GMP can reduce information asymmetry, help consumers recognize green alternatives, and strengthen both green product purchase willingness and broader sustainable consumer behavior (Cuc et al., 2022). For that reason, GMP represents the external signaling component of sustainable

consumption decision-making, complementing the internal consumer awareness, orientations and green identity.

1.4. Green purchase willingness as behavioral translation

Green Purchase Willingness (GPW) captures consumers' readiness to consider, prefer, and engage with green products in consumption decisions (Zhao et al., 2025). As a purchase-specific expression of sustainable consumption, GPW can be understood as a proximal component of SCB, which covers broader purchasing and post-purchasing practices (Jaiswal & Kant, 2018; White et al., 2019). Since willingness often precedes action, GPW provides an important starting point for later green purchase behavior and can gradually support more regular sustainable consumption (Zhao et al., 2025).

GPW also serves as a transmission mechanism through which internal identity and external market signals are translated into purchase readiness and sustainable behavior (Liao et al., 2026). Internally, consumers with stronger GCI are more motivated to engage in green product purchase because it allows them to express their green self-image and environmental values (Gravelines et al., 2022; Ishaq et al., 2025). Externally, GMP makes green alternatives more visible, understandable, and easier to evaluate by communicating their environmental value at the point of consumption (Liao et al., 2026; Tan et al., 2025). These internal and external inputs strengthen consumers' readiness to consider and engage with green products (Zhao et al., 2025). As willingness, a proximal antecedent of action (Pomery et al., 2009), becomes stronger and more persistent, the likelihood of translating purchase intentions into actual consumption behavior increases (Conner & Norman, 2022; Gattupalli et al., 2025).

1.5. The credibility disruption of perceived greenwashing

Perceived greenwashing refers to consumers' belief that firms exaggerate, misrepresent, or selectively communicate environmental claims to appear more sustainable than they actually are (Delmas & Burbano, 2011; Netto et al., 2020).

Perceived greenwashing can be conceptualized as a credibility-reducing condition that alters how consumers translate both external marketing signals and internal pro-environmental motivations into actual behavior. From a signaling perspective, the environmental attributes of green products are largely credence-based and difficult to verify directly; therefore, consumers often rely on external cues such as labels, packaging, product claims, and promotional messages when evaluating green products (Liao et al., 2026; Spence, 1978). When perceived greenwashing is high, consumers become more skeptical of the authenticity of sustainability information and increasingly view environmental claims as ambiguous or potentially misleading. As the credibility of these signals declines, the persuasive effectiveness of green marketing practices is weakened, reducing their ability to stimulate green purchase willingness and, downstream, sustainable consumption behavior (Wu & Liu, 2022).

A parallel but distinct mechanism operates at the level of self-concept. Consumers with a strong green consumer identity are motivated to express this self-concept through consumption choices; however, this mechanism functions most effectively when green products are perceived as authentic and reliable signals of environmental responsibility (Gravelines et al., 2022). When consumers perceive a high likelihood of greenwashing, uncertainty arises regarding whether green consumption genuinely reflects one's environmental values, reducing the credibility of green products as a vehicle to express identity (Netto et al., 2020; Wu & Liu, 2022). As a result, consumers become less willing to translate their green identity into green purchase willingness and, subsequently, sustainable consumption behavior (Liao et al., 2026).

1.6. The synthesized model framework

Building on identity-based and signaling perspectives, this study proposes an integrated framework explaining sustainable consumer behavior through the interaction of internal orientations, external market signals, and perceived credibility conditions. Internally, awareness of environmental issues and environmental protection attitude

foster green consumer identity, which in turn enhances green purchase willingness and sustainable consumer behavior. Externally, green marketing practices serve as sustainability signals that reduce information asymmetry and promote both green purchase willingness and sustainable consumption behavior. Green purchase willingness functions as a key mediating mechanism linking internal identity-based motivations and external marketing influences on sustainable consumer behavior.

Extending this framework, perceived greenwashing is conceptualized as a credibility-reducing condition that weakens the effectiveness of both internal and external drivers by diminishing the perceived authenticity of green consumption and sustainability signals, thereby attenuating their influence on green purchase willingness and sustainable consumer behavior.

Based on the proposed conceptual framework, this study aims to examine the proposed research model by testing the following hypotheses.

- H1: Awareness of environmental issues positively influences green consumer identity.*
- H2: Environmental protection attitude positively influences green consumer identity.*
- H3: Green consumer identity positively influences green purchase willingness.*
- H4: Green consumer identity positively influences sustainable consumer behavior.*
- H5: Green marketing practices positively influence green purchase willingness.*
- H6: Green marketing practices positively influence sustainable consumer behavior.*
- H7: Green purchase willingness positively influences sustainable consumer behavior.*
- H8: Green consumer identity and green purchase willingness sequentially mediate the relationships between awareness of environmental issues, environmental protection attitude, and sustainable consumer behavior.*

Source: Authors' own elaboration.

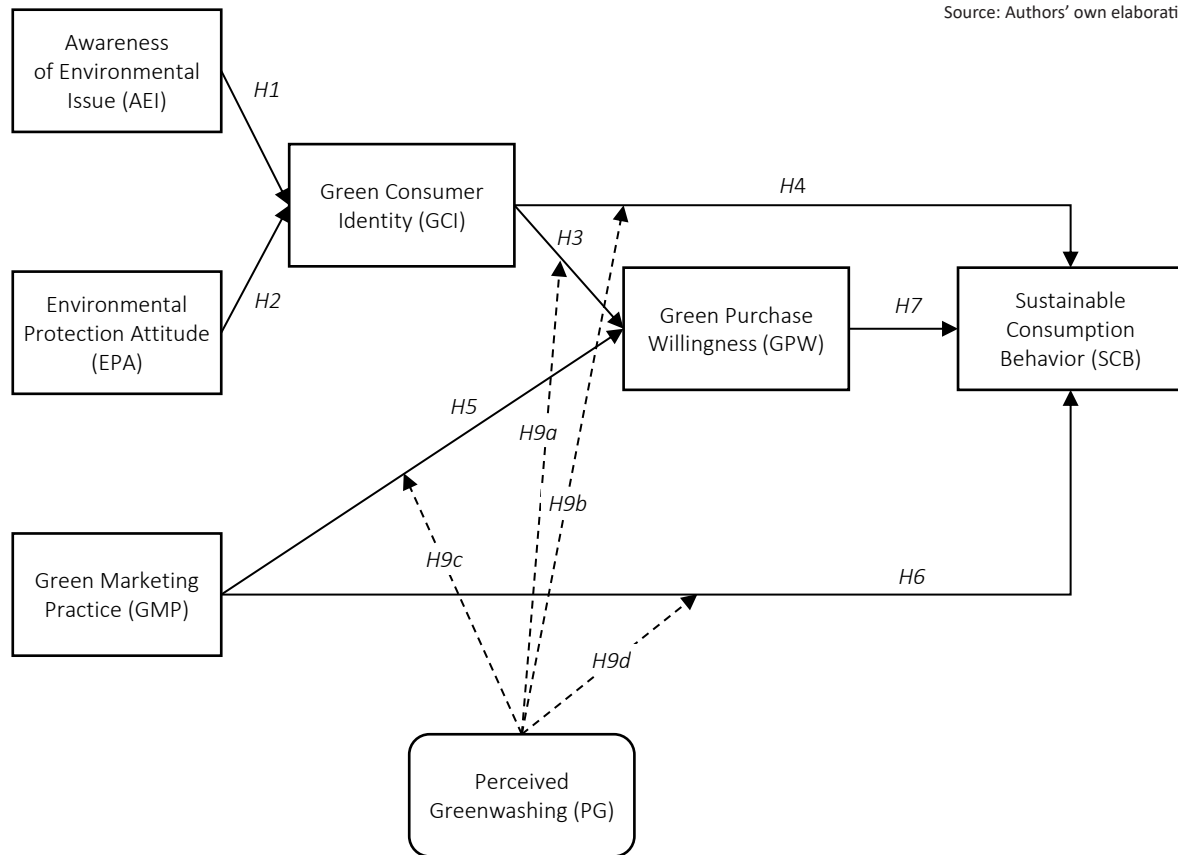


Figure 1. Proposed research model

H9a: Perceived greenwashing weakens the positive relationship between green consumer identity and green purchase willingness.

H9b: Perceived greenwashing weakens the positive relationship between green consumer identity and sustainable consumer behavior.

H9c: Perceived greenwashing weakens the positive relationship between green marketing practices and green purchase willingness.

H9d: Perceived greenwashing weakens the positive relationship between green marketing practices and sustainable consumer behavior.

The proposed model framework is illustrated in Figure 1.

2. METHODOLOGY

This study employed a quantitative cross-sectional survey design to examine the relationships between organizational and individual-level determi-

nants and sustainable consumer behavior among Generation Y (29 - <45 years) and -Generation Z (18 - <29 years) consumers in Vietnam. A convenience sampling approach was adopted, with deliberate efforts made to ensure balanced representation across gender, generational cohort, and income level to minimize sampling bias.

Data collection was geographically concentrated in Vietnam's major urban centers, intentionally targeting urban Gen Y and adult Gen Z consumers who represent the primary market segment for green products given their higher disposable incomes and more developed sustainability awareness (Dragolea et al., 2023). Data were collected voluntarily and anonymously between April and July 2025 through online platforms (Facebook, Instagram, Zalo, and e-commerce forums) and offline surveys at shopping malls and educational institutions.

Following data screening to remove incomplete or inconsistent responses, the final dataset comprised 656 valid responses. Based on the sampling

guideline proposed by Hair et al. (2010), the minimum recommended respondent-to-item ratio of 5:1 for a 53-item instrument requires at least 265 respondents. The achieved sample of 656 substantially exceeds this threshold, confirming adequate sample size for the planned analyses.

All ethical standards were observed, with participants fully informed of the study's purpose, assured of anonymity and confidentiality, and completion of the questionnaire treated as implied consent.

A structured questionnaire was developed using validated measurement items from prior studies. Measurement items for sustainable consumer behavior were adopted from Shiel et al. (2020). The five antecedent constructs were adapted from Bhatia and Jain (2014) and Dragolea et al. (2023). The moderating variable, greenwash perception, was measured using items from Li et al. (2025). All constructs were measured using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was developed in English and translated into Vietnamese using back-translation, with a pilot test conducted prior to full-scale data collection to verify item clarity.

Data analysis was conducted using IBM SPSS Statistics version 27 in conjunction with Hayes' PROCESS macro (version 5.0). Following descriptive profiling and reliability assessment using Cronbach's alpha (threshold $\alpha = 0.70$) (Nunnally & Bernstein, 1994), Pearson correlation analysis was performed to assess bivariate associations among all constructs. The direct effects of AEI and EPA on GCI ($H1-H2$), and the direct effects of GCI and GMP on GPW and SCB ($H3-H7$), were tested using multiple regression analysis. The sequential mediating roles of GCI and GPW in transmitting the effects of AEI and EPA on SCB ($H8$) were examined using PROCESS Model 6 with 5,000 bootstrap samples and a 95% bias-corrected confidence interval. The moderating role of perceived greenwashing on the relationships between GCI and GPW ($H9a$), GCI and SCB ($H9b$), GMP and GPW ($H9c$), and GMP and SCB ($H9d$) were tested using PROCESS Model 1, also with 5,000 bootstrap samples and a 95% confidence interval.

3. RESULTS

3.1. Sample profile

The demographic characteristics of respondents are summarized in Table 1. The gender distribution was balanced, with 50.6% female and 49.4% male, closely mirroring Vietnam's national gender structure where females account for 50.11% and males for 49.89% (National Statistics Office of Vietnam, 2025a). This alignment suggests that the survey data are broadly representative in terms of gender composition.

Age distribution reflects the study's generational focus. The sample comprised 53.7% Generation Z respondents (aged 18 to <29) and 46.3% Generation Y respondents (aged 29 to <45). This composition is consistent with evidence that younger cohorts are increasingly central to sustainable consumption. Specifically, 65% of Generation Z and 63% of Millennials have reported a willingness to pay more for environmentally sustainable products (Deloitte, 2025), positioning these generations as key drivers of green buying trends in Vietnam.

Income distribution further strengthens the dataset's representativeness. The largest group reported monthly earnings in the 5 to 10 million VND range (29.1%), followed by those earning 10 to 20 million VND (24.2%) and below 5 million VND (24.1%). Smaller proportions earned between 20 and 30 million VND (9.1%) and above 30 million VND (13.4%). This pattern is consistent with national income data, where the average monthly income was 8.2 million VND in the fourth quarter of 2024 (National Statistics Office of Vietnam, 2025b), suggesting the sample accurately captures the income structure of Vietnam's young and middle-income consumers.

Geographically, respondents were drawn primarily from Vietnam's two largest urban centers. Hanoi accounted for 44.7% of the sample, Ho Chi Minh City for 39.8%, and other cities for the remaining 15.5%. This urban concentration is appropriate given that green product markets are more developed in major cities, where consumer awareness of environmental issues and access to sustainable products are comparatively higher (Ngo et al., 2024).

Table 1. Overview of the sample profile

Source: Compilations by the authors.

Respondents		Frequency	Percent (%)
Gender	Male	324	49.4
	Female	332	50.6
Age	18 – <29	352	53.7
	29 – <45	304	46.3
Income	< 5 million VND	158	24.1
	5–10 million VND	191	29.1
	10–20 million VND	159	24.2
	20–30 million VND	60	9.1
	> 30 million VND	88	13.4
Cities	Hanoi	293	44.7
	Ho Chi Minh	261	39.8
	Other cities	102	15.5

3.2. Measurement model assessment

Prior to hypotheses testing, the reliability and factorial validity of all constructs were assessed using Cronbach's Alpha and Exploratory Factor Analysis (EFA). The results are presented in Table 2.

All seven constructs demonstrated strong internal consistency, with Cronbach's Alpha coefficients ranging from .845 to .925, all exceeding the accepted threshold of .70 (Nunnally & Bernstein, 1994). The Kaiser-Meyer-Olkin measure of .882 and a significant Bartlett's test of sphericity ($\chi^2 = 22629.182$, $df = 1378$, $p < .001$) confirmed the suitability of the data for factor analysis. EFA yielded a seven-factor solution explaining 58.85% of total variance. Factor loadings ranged from .490 to .777. The minimum loading of .490 is considered acceptable given the sample size of 656, as Hair et al (2010) indicated that loadings of .30 and above achieve statistical significance at larger sample sizes.

Table 2. Cronbach's Alpha reliability coefficients and EFA results

Source: Compilations by the authors.

Constructs	Cronbach's Alpha	Loading range
Awareness of Environmental Issues (AEI)	.897	.591 – .695
Environmental Protection Attitude (EPA)	.869	.642 – .770
Green Consumer Identity (GCI)	.901	.490 – .777
Green Marketing Practices (GMP)	.900	.595 – .756
Green Purchase Willingness (GPW)	.845	.684 – .728
Sustainable Consumption Behavior (SCB)	.925	.507 – .700
Perceived Greenwashing (PG)	.876	.702 – .764

Note: KMO = 0.882. Bartlett's test of sphericity was significant ($\chi^2 = 22629.182$, $df = 1378$, $p < .001$). The seven-factor solution explained 58.85% of the total variance.

Multicollinearity was also assessed using Variance Inflation Factor (VIF) and tolerance values. All VIF values ranged from 1.097 to 1.299, well below the conservative threshold of 3.3 (Hair et al., 2010), indicating no multicollinearity concerns among the predictor variables. Taken together, these results confirm the reliability, factorial distinctiveness, and structural integrity of the measurement model.

3.3. Hypotheses testing

The correlation analysis (Table 3) shows that all core constructs are significantly and positively related in the expected direction, providing initial support for the proposed model. Notably, green consumer identity exhibits the strongest association with sustainable consumption behavior, while perceived greenwashing is negatively correlated with sustainable consumption behavior, indicating its potential inhibitory role in sustainable decision-making.

Table 3. Pearson correlations among constructs

Source: Compilation by the authors.

	AEI	EPA	GCI	GMP	GPW	SCB	PG
AEI	1.000	.185**	.308**	.269**	.100*	.398**	0.044
EPA	.185**	1.000	.320**	.309**	.210**	.365**	.087*
GCI	.308**	.320**	1.000	.350**	.244**	.466**	.133**
GMP	.269**	.309**	.350**	1.000	.204**	.422**	0.043
GPW	.100*	.210**	.244**	.204**	1.000	.358**	.079*
SCB	.398**	.365**	.466**	.422**	.358**	1.000	-.222**
PG	0.044	.087*	.133**	0.043	.079*	-.222**	1.000

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

The hypotheses were tested using multiple linear regression analyses. The results (Table 4) indicate that all proposed direct relationships are statisti-

Table 4. Multiple regression model summary

Source: Compilation by the authors.

Hypothesis	Path	β	p-value	Result
H1	AEI $\rightarrow$ GCI	0.263	< .001	Supported
H2	EPA $\rightarrow$ GCI	0.210	< .001	Supported
H3	GCI $\rightarrow$ GPW	0.251	< .001	Supported
H4	GCI $\rightarrow$ SCB	0.393	< .001	Supported
H5	GMP $\rightarrow$ GPW	0.118	0.001	Supported
H6	GMP $\rightarrow$ SCB	0.268	< .001	Supported
H7	GPW $\rightarrow$ SCB	0.262	< .001	Supported
H9a	GCI $\times$ PG $\rightarrow$ GPW	0.0158	0.647	Rejected
H9b	GCI $\times$ PG $\rightarrow$ SCB	-0.0714	0.045	Supported
H9c	GMP $\times$ PG $\rightarrow$ GPW	-0.0172	0.685	Rejected
H9d	GMP $\times$ PG $\rightarrow$ SCB	-0.0929	0.028	Supported

cally significant and consistent with the theoretical expectations. Specifically, awareness of environmental issues ($\beta = 0.263$, $p < .001$) and environmental protection attitude ($\beta = 0.210$, $p < .001$) both exert significant positive effects on green consumer identity, supporting H1 and H2. This confirms that internal cognitive awareness and evaluative orientation jointly contribute to the formation of a self-relevant green identity.

Green consumer identity also demonstrates a significant positive influence on both green purchase willingness ($\beta = 0.251$, $p < .001$) and sustainable consumption behavior ($\beta = 0.393$, $p < .001$), thereby supporting H3 and H4. These results indicate that identity plays a central motivational role in translating internal environmental orientation into both intention and behavior.

Regarding external factors, green marketing practices significantly affect green purchase willingness ($\beta = 0.118$, $p = .001$) and sustainable consumption behavior ($\beta = 0.268$, $p < .001$), supporting H5 and H6. Besides, green purchase willingness significantly predicts sustainable consumption behavior ($\beta = 0.262$, $p < .001$), confirming H7 and reinforcing its role as a proximal behavioral antecedent.

The moderating role of perceived greenwashing reveals a differentiated pattern across behavioral stages (Table 4). While perceived greenwashing does not significantly moderate the relationships between green consumer identity and green purchase willingness (H9a) or between green marketing practices and green purchase willingness (H9c), it weakens the effects of both green con-

sumer identity ($\beta = -0.071$, $p = .045$) and green marketing practices ($\beta = -0.093$, $p = .028$) on sustainable consumption behavior. Thus, H9b and H9d are supported.

These findings suggest that perceived greenwashing primarily disrupts the translation of both identity-based and marketing-based drivers into actual behavioral outcomes, rather than affecting initial willingness formation.

The serial mediation analyses provide further insight into the underlying mechanisms linking internal environmental orientations to sustainable consumption behavior (Table 5). For environmental awareness, the results show a significant indirect effect through Green Consumer Identity (GCI), supporting the mediating role of identity. The sequential pathway from awareness of environmental issues through consumer identity and green purchase willingness to sustainable consumption behavior is also significant, indicating that identity and purchase willingness jointly transmit the effect of environmental awareness to sustainable behavior. However, the indirect effect via green purchase willingness alone is not significant. For environmental protection attitude, all indirect pathways are statistically significant, indicating that attitudes influence sustainable consumption through identity-based, intention-based, and sequential mechanisms.

Overall, the mediation results confirm that green consumer identity and green purchase willingness operate as key sequential mechanisms linking internal environmental orientations to sustainable consumption behavior.

Table 5. Mediation analysis

Source: Compilation by the authors.

Indirect path	Effect	Boot LLCI	Boot ULCI	Result
AEI → GCI → SCB	0.124	0.085	0.168	Supported
AEI → GPW → SCB	0.009	−0.018	0.034	Rejected
AEI → GCI → GPW → SCB	0.023	0.012	0.036	Supported
EPA → GCI → SCB	0.105	0.070	0.142	Supported
EPA → GPW → SCB	0.032	0.014	0.054	Supported
EPA → GCI → GPW → SCB	0.014	0.007	0.023	Supported

3.4. Gen Z and Y comparison

Independent-samples t-tests were conducted to examine differences between Generation Z and Generation Y across key sustainability-related constructs (Table 6). The results indicate a statistically significant difference only for awareness of environmental issues, with Generation Z reporting higher levels than Generation Y while no significant differences were found for other variables.

Table 6. Multiple regression model summary

Source: Compilation by the authors.

Construct	Gen Z	Gen Y	Mean difference (Z–Y)	p
GMP	3.824	3.830	−0.006	0.928
EPA	3.637	3.542	0.096	0.171
AEI	3.939	3.822	0.117	0.027
GCI	3.712	3.730	−0.019	0.728
GPW	3.559	3.625	−0.066	0.249
SCB	3.914	3.805	0.109	0.102
GW	2.868	2.991	−0.123	0.088

Overall, the findings suggest that generational differences are primarily cognitive in nature rather than behavioral. While Generation Z demonstrates higher environmental awareness, this does not translate into systematically different identity formation, purchase willingness, or sustainable consumption behavior. This pattern reinforces the idea that sustainability-related behavioral mechanisms are structurally stable across generations, even when baseline environmental awareness differs.

4. DISCUSSION

4.1. Overview of the findings

This study examined how internal sustainability orientations and external green marketing signals jointly shape sustainable consumer behavior among urban Generation Y and adult Generation

Z consumers in Vietnam, and how perceived greenwashing conditions these relationships. The results support an integrated model in which sustainable consumption is primarily driven by internalized green consumer identity, supported by external marketing signals, and shaped at the behavioral execution stage by perceived greenwashing. Overall, identity emerges as the key mechanism translating internal orientations into behavior, while greenwashing selectively interrupts the conversion of motivation into action.

4.2. Theoretical contributions

The results show that awareness of environmental issues ($\beta = 0.263$, $p < .001$) and environmental protection attitude ($\beta = 0.210$, $p < .001$) jointly contribute to green consumer identity, with awareness emerging as the slightly stronger antecedent. This pattern indicates that cognitive recognition of environmental problems appears to play a stronger role than evaluative orientation in shaping how Vietnamese consumers internalize environmental responsibility as part of self-concept. This finding is consistent with Ogiemwonyi et al. (2023), who reported that environmental awareness operates as the cognitive precondition for pro-environmental behavior. By estimating awareness and attitude as parallel antecedents of identity rather than as direct predictors of behavior, the present study extends this prior evidence and suggests that the two internal orientations operate not as substitutes but as complementary inputs to a deeper identity-based mechanism, a sequence less explicitly modeled in earlier studies (Ngo et al., 2024).

4.3. Green consumer identity as the central motivational driver

Green consumer identity exerted the strongest direct effect on sustainable consumer behavior

ior ($\beta = 0.393$, $p < .001$) with significantly influenced green purchase willingness ($\beta = 0.251$, $p < .001$), confirming its central motivational role. These results position the internalization of environmental responsibility into self-concept as the most consequential predictor of sustainable choice among urban Vietnamese Generation Y and adult Generation Z consumers. This finding aligns with Gravelines et al. (2022), who reported that green self-identity and self-congruity drive sustainable consumption in a European context, and Ishaq et al. (2025), whose findings positioned moral self-identity as a primary route to green behavior. The present study extends these findings to an emerging-economy youth segment in which identity-based motivation has only recently begun to receive direct empirical attention (Lavuri, 2023; Ngo et al., 2024). It also explicitly positions green consumer identity as a distinct mediating mechanism linking internal sustainability orientations to sustainable outcomes, thereby offering a more process-oriented explanation of sustainable consumer behavior that helps contextualize generational patterns reported by Casalegno et al. (2022).

4.4. Green marketing practices role as external signal

Green marketing practices significantly influenced both green purchase willingness ($\beta = 0.118$, $p = .001$) and sustainable consumer behavior ($\beta = 0.268$, $p < .001$), supporting the signaling role of firm-level cues. However, the magnitude of these effects is substantially smaller than that of green consumer identity, indicating that external marketing communications operate as supportive cues rather than as primary determinants of behavior in this sample. This pattern echoes Mahmoud et al. (2022), who found that green marketing practices positively influence purchase intention but generally with weaker effect sizes than internal antecedents. The relatively modest direct effect of green marketing in the present study contrasts with Tan et al. (2025), where strategic green marketing orientation produced larger effects on consumer outcomes in small and medium enterprises, but it is attributable to the consumer-side perspective adopted here, which captures consumers' interpretation of firm signals rather than firms' strategic posture. The combined evidence indicates that, in the Vietnamese context, green marketing supple-

ments but does not substitute for the internalized sustainability orientation that drives consumer green behavior.

4.5. Green purchase willingness as a transmission mechanism

Green purchase willingness significantly predicted sustainable consumer behavior ($\beta = 0.262$, $p < .001$) and operated as a sequential mediator linking green consumer identity to behavior. The serial mediation results further show that environmental awareness and environmental protection attitude transmit their effects to sustainable behavior primarily through identity, and from identity into purchase willingness and then behavior. This pattern is consistent with the intention-behavior bridge by (Conner & Norman, 2022), who emphasized intention strength as the proximal driver of action, and with Zhao et al. (2025), whose appraisal-based model identified willingness as a critical mediator linking cognitive antecedents to sustainable purchase. The non-significant indirect effect from awareness to behavior via willingness alone is informative: it indicates that awareness influences willingness not directly but through identity formation, which is in line with Oyserman's (2009) identity-based motivation perspective. The current results therefore extend prior single-mediator designs by Paul et al. (2016), showing that identity and willingness form a coherent sequential mechanism rather than two parallel routes.

4.6. Differential moderation by perceived greenwashing

Perceived greenwashing did not significantly moderate the relationships between green consumer identity and green purchase willingness or between green marketing practices and green purchase willingness but weakened the effects of both on sustainable consumer behavior. This stage-specific pattern indicates that greenwashing concerns do not block the formation of purchase willingness but disrupt the conversion of motivation and signals into actual behavioral outcomes. The finding both confirms and refines earlier studies. Wu and Liu (2022) reported that greenwashing weakens the effect of green marketing on brand trust. Similarly, Li et al. (2025) showed that environmental knowledge mitigates the negative effect of greenwashing on elec-

tric car purchase, but did not separate willingness from behavior. By distinguishing these two stages, the present study indicates that consumers may continue to express intention under conditions of suspicion yet hesitate to convert that intent into action. Accordingly, the present findings position perceived greenwashing as a behavioral-stage moderator rather than a uniform inhibitor of sustainable consumption, refining prior research that address greenwashing primarily as a general preventive mechanism to green consumer responses.

The findings suggest two strategic priorities to promote sustainable consumption among Generation Y and adult Generation Z consumers in Vietnam. First, because green consumer identity emerged as the strongest driver of sustainable consumer behavior, firms should focus not only on increasing environmental awareness but also on creating opportunities for consumers to internalize and express environmental responsibility as part of their self-concept. Product customization, environmental campaigns, community initiatives, and co-creation projects represent potential avenues for encouraging active consumer involvement with sustainability-related activities. By allowing consumers to participate in and personally express environmental values, these initiatives may strengthen green consumer identity and in-

crease the likelihood that sustainable intentions are translated into actual behavior.

Secondly, the results indicate that perceived greenwashing primarily disrupts the conversion of motivation and sustainability signals into actual behavior rather than the formation of green purchase willingness itself. Consequently, efforts to mitigate the negative effects of greenwashing should focus on restoring the credibility of sustainability-related information at the behavioral decision stage. This may be achieved through three complementary approaches: strengthening the credibility of sustainability signals, reducing consumers' perceptions of greenwashing, and introducing independent credibility-enhancing mechanisms. The first two approaches require firms to communicate sustainability efforts more authentically through accurate, transparent, and verifiable environmental claims while avoiding exaggerated or manipulative messaging. The third approach involves the use of external verification tools, such as third-party certifications, eco-labels, traceability systems, and independent auditing schemes, which can provide consumers with trusted reference points when evaluating environmental claims. Collectively, these measures can reduce skepticism toward sustainability signals and facilitate the translation of existing environmental motivations into actual purchasing and consumption behaviors.

CONCLUSIONS

This study set out to identify how individual sustainability orientations and organizational green marketing practices jointly shape sustainable consumer behavior, and how perceived greenwashing conditions these relationships, among urban Generation Y and adult Generation Z consumers in Vietnam. Three conclusions can be drawn from these results. First, sustainable consumption among younger Vietnamese consumers appears to be fundamentally identity-driven, with environmental awareness and environmental protection attitudes becoming behaviorally consequential only after they have been internalized as part of consumers' green self-concept. Second, green marketing remains an important driver of sustainable consumer behavior, but its influence is more supportive than primary when compared with identity-based motivations. Third, perceived greenwashing operates as a stage-specific credibility barrier that disrupts the translation of environmental motivations into behavior rather than the formation of green purchase willingness itself.

LIMITATIONS AND FUTURE RESEARCH

Several limitations should be acknowledged. First, the study focuses on urban consumers in Vietnam's major cities; therefore, consumers in rural areas, who may face different infrastructural and informational conditions, could exhibit different behavioral patterns and should be examined in future research. Second, the focus on Generation Y and adult Generation Z limits generalizability to older cohorts,

whose environmental attitudes and motivations may be shaped by different life-stage and value-based factors. Third, perceived greenwashing was operationalized as a consumer-level perception rather than as responses to specific firm claims or context-specific green marketing stimuli. Future research could provide a more granular understanding of these credibility concerns by examining how different types of green claims influence perceived greenwashing.

AUTHOR CONTRIBUTIONS

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