MANAGEMENT
2025, Vol. 29, No. 1
www.management-poland.com
DOI: 10.58691/man/205146

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The impact of environmental factors on green purchase intention and green purchase behavior: The moderating role of price sensitivity

Abstract

Research background and purpose: This study investigates how psychological factors, namely environmental and health awareness, influence green purchase intention and behavior, emphasizing the moderating role of price sensitivity. It identifies factors shaping green cosmetic purchase behavior, grounded in the Theory of Planned Behavior (TPB).
Design/methodology/approach: A cross-sectional design and convenience sampling were employed to gather data from 300 Vietnamese consumers. SmartPLS 3.0 software was used to analyze the data, testing the moderating effect of price sensitivity and examining the relationships among influencing factors.
Findings: The findings reveal that price sensitivity negatively moderates the relationship between green purchase intention and behavior. Additionally, factors such as environmental concern, knowledge, attitude, health consciousness, green purchase intention, and eco-labels show a positive correlation with green cosmetic purchase behavior.
Value added and limitations: This research contributes to the green marketing literature within Vietnam's green economic transition by expanding the TPB with psychological and environmental awareness factors. It offers practical insights for businesses to design pricing strategies based on price sensitivity's impact. However, limitations include a focus solely on green cosmetics, limiting generalizability, and the use of convenience sampling, which may affect data representativeness and reliability.

Keywords: *price sensitivity, green comestics, green purchase behavior, smartPLS*

JEL Classification: M31, D12, Q50, D43

Received: 2025-02-16; **Final review:** 2025-04-17; **Accepted:** 2025-05-14

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1. Introduction

According to Hoang and Thanh (2024), IQAIR's data shows that the Air Quality Index (AQI) in Vietnam is currently very poor, with PM2.5 particulate matter levels exceeding the World Health Organization's safety standards by 4.2 times. It is estimated that approximately 1,400 residents in the country die prematurely each year due to exposure to polluted air (Hoang & Thanh, 2024). Not only is the air polluted, but there are also numerous other forms of pollution in Vietnam. According to Hoang et al. (2024), Vietnam ranked last on the global Environmental Performance Index (EPI), positioned 180th out of 180 countries, with a score of only 24.5/100. This situation indicates that the environmental situation in the country is at a critical level. Additionally, Vietnam's ranking has been consistently declining in recent years, from 141st out of 180 in 2020, to 178th in 2022, and to the last position in 2024 (Hoang et al., 2024). In a study by Grunert (1992), it was found that individual consumer behaviors significantly contribute to environmental degradation. Therefore, when the public's awareness of the environment changes, it has led to a new wave of research on green purchase behavior (Amin & Tarun, 2021).

Currently, there are numerous research topics related to consumer behavior regarding the purchase of green products. Notable studies include Lee (2017), Ghali-Zinoubi (2020), Yue et al. (2020), and Simanjuntak et al. (2023), which hypothesize that certain factors positively influence green purchase behavior.

Not only are there foreign studies, but green purchase behavior is also a very hot topic in Vietnam. According to Ngo and Pham (2018), the state's policies have played an important role in shaping green purchase trends and encouraging the public to choose environmentally friendly products. Additionally, studies such as Nguyen and Ha (2023), Phan et al. (2023), and Nguyen and Nguyen (2024) have demonstrated the positive relationship of factors influencing green purchase behavior.

Furthermore, the Ministry of Industry and Trade's electronic journal reports that the demand for green products has increased by 15% annually from 2021 to 2023 in Vietnam (Anh, 2024). A total of 72% of consumers are willing to pay more for green products. Among them, personal care products, especially cosmetics, are being considered a lucrative market in Vietnam. According to the latest report from Statista, revenue in the cosmetics industry in Vietnam is expected to grow significantly, reaching an estimated 2.66 billion USD this year (Tuc, 2024). As a result, businesses are fiercely competing in the green cosmetics market, which is experiencing robust growth. However, many cosmetics companies are still struggling to transition to green strategies due to a lack of thorough market research. This has resulted in a limited understanding of consumer perceptions, knowledge, and expectations regarding green products. Therefore, research on green cosmetics has become crucial in the current market context.

In an era of economic development, with trends changing over time, the intention and behavior of consumers towards green products are constantly evolving. Previous studies on consumers' green purchase intention/behavior have been mostly conducted in developed countries, focusing on analyzing their attitudes and perceptions towards environmentally friendly products. In contrast, Vietnam is a developing country with an economy transitioning towards a green economy. Additionally, there are numerous factors hindering green purchase intention/behavior among Vietnamese consumers.

According to Huong (n.d.), when analyzing the cosmetics market in Vietnam, one of the major challenges is price sensitivity. Moreover, the Vietnamese economy is facing numerous challenges (Nga, 2025). The geopolitical conflicts in Ukraine and the Middle East, coupled with the rising trend of sea freight rates, are creating significant pressures. In particular, the appreciation of the USD in the global market is causing difficulties for domestic exchange rates, interest rates, and inflation (Nga, 2025). The prolonged inflationary situation, which has made the prices of goods and services expensive, has significantly affected consumers' spending choices.

Studies have been conducted on the impact of price sensitivity on consumer purchasing behavior. At the same time, many factors hinder the green cosmetics purchase behavior of the public, such as price sensitivity. According to Briz and Ward (2009) and Ghali-Zinoubi (2020), price sensitivity can limit the intention and behavior of green purchases. Another study by Sheikh et al. (2023) demonstrates that price sensitivity has a significant and negative impact on green purchasing behavior. Similarly, studies by Hsu et al. (2017) and Bhutto et al. (2022) also demonstrate the moderating role of price sensitivity in relation to the TPB framework and its significance on consumers' purchase intention in the studied market. Moreover, as of 2024, recent research topics have only examined the inverse relationship, and a few studies have tested the moderating role of price sensitivity in green purchase behavior, but it has not been highlighted in terms of its moderating effect. Notably, studies by Nguyen et al. (2021) and Ao et al. (2021) indicate that price sensitivity significantly impacts green purchase behavior. Phan et al. (2023) also explored the moderating role of price sensitivity in green purchase behavior, but the author's hypothesis was not accepted.

Therefore, this study applies the Theory of Planned Behavior (TPB) framework in the field of environmental psychology and cognition to propose factors (environmental concern, environmental knowledge, environmental attitude, and health consciousness) to understand consumers' green cosmetic purchasing behavior in Vietnam. In addition, there is growing empirical evidence that price sensitivity and eco-labeling are factors that affect green purchasing behavior. Therefore, the current study has extended the TPB framework and measured its impact on consumers' green purchase intention and behavior in Vietnam.

In summary, this research focuses on two main issues. First, how the factors are related to green purchasing behavior. Second, the moderating role of price sensitivity on consumers' green purchasing behavior. The study uses updated 2024 data, focusing on the vibrant cosmetics market in Vietnam for better reliability and accuracy. Furthermore, the author proposes factors for a new research model suitable for the current era and identifies the moderating effect of price sensitivity to provide effective solutions to encourage consumers to choose green products. This study offers implications for managers to better understand the nature of these behaviors and devise appropriate pricing strategies to promote green cosmetics purchases. Therefore, the study is structured as follows. The study begins with a literature review and presents the hypotheses. Subsequently, the research methodology is described, followed by a discussion of the findings and research implications.

2. Literature review

2.1. Theory of Planned Behavior (TPB)

The TPB, proposed by Ajzen (1991), focuses on predicting both actual behavior and consumer intentions. This theory by Ajzen (1991) is an extension of the Theory of Reasoned Action – TRA (Fishbein & Ajzen, 1977). Both models are designed to clearly explain the influence of information and motivation on behavioral intentions. Overcoming the limitation of the view that human behavior is entirely dominated by reason, the TPB model offers a more comprehensive perspective. Compared to the TRA model, TPB is considered a significant advancement in predicting and explaining behavior. Recent studies have applied the Theory of Planned Behavior (TPB) to predict green consumer behavior towards green products, as seen in Ogiemwonyi (2022), Gamel et al. (2022), Kaur et al. (2024).

2.2. Hypotheses development

2.2.1. The Relationship Between Green Purchase Intention and Green Purchase Behavior

According to Rashid (2009), green purchase intention reflects the consumer's willingness and prioritization when choosing products that minimize environmental impact compared to other conventional products. Additionally, as defined by Alhomssi and Abbass Ali (2022), green purchase behavior is a form of sustainable consumption, encompassing the entire process from product purchase and usage to waste disposal, aimed at minimizing negative environmental impact throughout the product's life cycle.

Previous studies have demonstrated the relationship between purchase intention and consumer behavior, based on foundational theories such as TRA (Fishbein & Ajzen, 1977) and TPB (Ajzen, 1991). Numerous studies, including those on green purchases, have provided strong evidence showing that purchase intention directly influences the behavior of consumers when buying products (Ajzen et al., 2018; Lai & Cheng, 2016; Minbashrazgah et al., 2017). Researchers such as Kanchanapibul et al. (2014) and Phan et al. (2023) also agree with this viewpoint and suggest that green purchase intention positively impacts green purchase behavior. Therefore, the authors propose the following hypothesis:

H1: Green purchase intention positively influences green cosmetic purchase behavior.

2.2.2 Environmental Concern, Green Purchase Intention and Green Purchase Behavior

According to Singh and Bansal (2012), environmental concern refers to an interest in protecting the environment and finding solutions to related issues. This is often expressed through an individual's orientation toward the environment, reflected in their level of concern for environmental problems (Kim & Choi, 2005). Hu et al. (2010) suggest that environmental concern (EC) refers to the public's awareness, capability, and involvement in environmental issues. Green consumers are those who avoid using products that negatively impact the environment. Therefore, EC is a significant factor influencing green purchase intention/ behavior. Studies by Zhao et al. (2014), Esmaeilpour and Bahmiary (2017), and Yue et al. (2020) all highlight the significant relationship between environmental concern and green purchase intention. Prior research by Anbukarasi and Dheivanai (2017); Lavuri and Susandy (2020) has shown that green behavior, especially behavioral traits, is strongly influenced by EC. Jaiswal and Kant (2018); Prakash and Pathak (2017) also support the notion that EC has a positive impact on green purchasing behavior. Therefore, the authors propose the following hypotheses:

H2a: Environmental concern positively influences green purchase intention.
H2b: Environmental concern positively influences green purchase behavior.

2.2.3. Environmental Knowledge, Green Purchase Intention and Green Purchase Behavior

D'Souza et al. (2007) define environmental knowledge as consumers' understanding of the environmental impacts caused by the use of certain products. According to

Fryxell and Lo (2003), environmental knowledge is a crucial factor influencing pro-environmental behavior. When individuals possess knowledge about environmental issues and have a clear understanding of the natural environment, they are more likely to act in a more environmentally responsible manner (Fryxell & Lo, 2003). Several authors have argued that environmental knowledge is a factor influencing consumers' green purchase intention. Notably, studies by Lee (2017) and Rusyani et al. (2021) have shown a positive relationship between environmental knowledge and green purchase intention, despite the diversity of research contexts. Otto and Pensini (2017), Paço and Lavrador (2017), and Saari et al. (2021) also highlighted the importance of environmental knowledge in shaping behavior. These authors demonstrated that, similar to other studies, environmental knowledge has a significant impact on consumer behavior. Therefore, the author proposes the following hypotheses:

H3a: Environmental knowledge positively influences green purchase intention.
H3b: Environmental knowledge positively influences green purchase behavior.

2.2.4. Environmental Attitude, Green Purchase Intention and Green Purchase Behavior

Ajzen (1991) states that attitudes toward a behavior reflect an individual's perception of whether the behavior is beneficial or detrimental. Attitude is defined as a person's positive or negative feelings toward a specific object, event, or phenomenon (Khan & Khan, 2006). Milfont and Duckitt (2010), environmental attitude is understood as the ability to evaluate the state of the environment with a certain degree of agreement (favor) or disagreement (disfavor). Yeon Kim and Chung (2011), demonstrated that attitudes significantly affect consumers' purchase intentions for organic personal care products. Studies by Chan and Lau (2001), Wesley et al. (2012), Nagar (2015), and Yadav and Pathak (2016) also support the positive relationship between environmental attitudes and purchase intentions. A study by Varshneya et al. (2017) shows that individuals with positive attitudes towards the environment often participate in sustainable activities, thereby promoting green purchasing behavior. The aforementioned viewpoint is corroborated by the findings of Ogiemwonyi et al. (2023) and Sondhi et al. (2023). Therefore, the authors propose the following hypotheses:

H4a: Environmental attitude positively influences green purchase intention.
H4b: Environmental attitude positively influences green purchase behavior.

2.2.5. Health Consciousness, Green Purchase Intention and Green Purchase Behavior

Health consciousness (HC) represents consumers' concern and actions to protect their health and well-being (Westhoek et al., 2014). Gould (1988) identified four key elements of health consciousness: seeking health information, caring about health, valuing healthy conditions, and being conscious of protecting health. Moreover, Gould (1988) suggests that a health-conscious person should choose products that are good for both health and the environment. Several studies, such as those by Kabadayı et al. (2015), Chen and Deng (2016), Yadav and Pathak (2016), Ghali-Zinoubi (2020) and P.-H. Nguyen et al. (2023b), argue that individuals with a higher level of health consciousness are more likely to purchase green products.. Therefore, the authors propose the following hypotheses:

H5a: Health consciousness positively influences green purchase intention.
H5b: Health consciousness positively influences green purchase behavior.

2.2.6. The mediating role of green purchase intention

The desire for green purchases and responsible purchase behavior are not always correlated among consumers. In reality, their consumption intentions towards green products can be influenced by various factors, including EC (Ogiemwonyi et al., 2023; Pagiaslis & Krontalis, 2014), EK (Gkargkavouzi et al., 2019; Saari et al., 2021), EA (Pagiaslis & Krontalis, 2014; Sondhi et al., 2023), and HC (Ghali-Zinoubi, 2020; P.-H. Nguyen et al., 2023). According to the theory TPB of Ajzen (1991), intention is considered the most important predictor of human behavior. The fundamental principle of it is the strong relationship between intention and actual behavior. In general, TPB has been shown to be a useful model for understanding and predicting purchasing behavior related to environmentally friendly products (Ghali-Zinoubi, 2020; Kaur et al., 2024; Phan et al., 2023). Therefore, the authors propose the following hypotheses:

H6a: Green purchase intention significantly mediates the relationship between environmental concern and green purchase behavior.
H6b: Green purchase intention significantly mediates the relationship between environmental knowledge and green purchase behavior.
H6c: Green purchase intention significantly mediates the relationship between environmental attitude and green purchase behavior.
H6d: Green purchase intention significantly mediates the relationship between health consciousness and green purchase behavior.

2.2.7. The Moderating Role of Price Sensitivity in the Relationship Between Green Purchase Intention and Green Purchase Behavior

Price sensitivity is defined as the extent to which consumers alter their purchasing behavior in response to changes in product price (Ghali-Zinoubi & Toukabri, 2019). Each individual's sensitivity to price varies; some are highly concerned about price, while a few are willing to pay more for high-quality products (Yue et al., 2020). This makes price a barrier to purchasing green products (Marian et al., 2014). A study by Walser-Luchesi and Nanopoulos (2007) indicates that the more sensitive consumers are to the price of green products, the harder it is for them to purchase them due to their higher cost. Several studies, such as those by Low et al. (2013) and Yue et al. (2020), support this view. Ghali-Zinoubi (2020) also affirms that price sensitivity is a moderating factor affecting the relationship between intention and sustainable consumption behavior. Therefore, the authors propose the following hypothesis:

H7: Price sensitivity moderates the relationship between green purchase intention and green cosmetic purchase behavior.

2.2.8. The Relationship Between Eco-labeling and Green Purchase Behavior

Eco-labels relate to the overall environmental performance of a product and serve as indicators of this performance. They are designed to prevent consumer confusion regarding environmental friendliness claims (Rashid, 2009). Eco-labels can positively influence the relationship between green product knowledge and consumer purchase intention when consumers are aware of them (Suki, 2013). Mayrowani (2012) indicates that eco-labels can increase consumer interest in environmentally friendly products. Furthermore, eco-labels serve as an informational bridge, helping consumers understand the values that a product offers (Sewwandi & Dinesha, 2022). Therefore, eco-labeling (EL) has become an effective marketing tool, helping companies build a positive image and attract loyal customers (Devi Juwaheer et al., 2012). Several studies have demonstrated a positive relationship between eco-labeling and green purchase behavior, such as the research by Sewwandi and Dinesha (2022) and Bautista et al. (2023). Therefore, the authors propose the following hypothesis:

H8: Eco-labeling positively influences green purchase behavior.

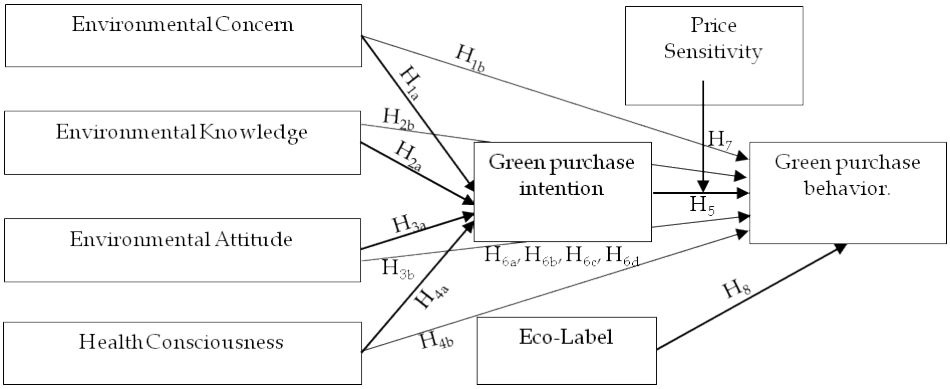

Figure 1. **Proposed Model**

Source: own study

3. Methods

The study employs SmartPLS 3 to analyze and test the moderating effect of price sensitivity and examine the relationships among factors influencing green cosmetic purchase behavior. The PLS-SEM method has proven its critical role in estimating complex models, particularly in the context of big data and pioneering studies. The flexibility of PLS-SEM has opened new opportunities for assessing data quality and exploring latent relationships, contributing to the advancement of scientific theories.

3.1. Research procedure

The study utilizes both qualitative and quantitative research methods.

- Qualitative research: A focus group interview was conducted with seven green cosmetic users in Ho Chi Minh City. The authors identified the factors, research objectives, and refined the scale in the first iteration. Subsequently, the authors interviewed a Ph.D. from the Faculty of Business Administration and finalized the scale.
- Quantitative research: The authors conducted a survey at supermarket centers with green cosmetic stores in Vietnam and online through social networking sites (Facebook, Zalo, etc.). The authors distributed approximately 500 questionnaires and received only 398 responses. Subsequently, the authors used Excel and SPSS 20.0 software to filter out invalid responses. Finally, the authors obtained 300 valid

responses and proceeded to use SmartPLS 3 software to check the reliability of the Cronbach's Alpha and Composite Reliability indices, which must be greater than 0.7 (Hulland, 1999; Nunnally & Bernstein, 1994) and Average Variance Extracted (AVE) > 0.5 (Hair Jr et al., 2014). Additionally, the discriminant validity of latent variables was ensured by maintaining the Heterotrait- Monotrait ratio (HTMT) < 0.85 (Henseler et al., 2015).

In this study, the indicators R^2, Q^2, and f^2 were used to evaluate model fit and explanatory power. According to Hair Jr et al. (2014), R^2 values of 0.19, 0.33, and 0.67 correspond to weak, moderate, and strong explanatory power, respectively. The predictive relevance of the model was assessed based on Q^2 values following the criteria proposed by (Henseler et al., 2015): weak ($Q^2 < 0.02$), moderate ($0.02 \leq Q^2 \leq 0.35$), and strong ($Q^2 > 0.35$). Lastly, the f^2 values were evaluated following (Hair Jr et al., 2014), with relationships between variables being considered significant when $f^2 > 0.15$, very strong when $f^2 > 0.35$, and insignificant when $f^2 < 0.02$.

3.2. Measurement Scales

The measurement scales used in this study were adapted and refined from prior research. The Environmental Concern scale was adopted from Rusyani et al. (2021). The Environmental Knowledge scale was cited from Wahid et al. (2011). The Environmental Attitude scale was inherited from Bhattacharya (2019). The Health Consciousness and Price Sensitivity scales were cited from Ghali-Zinoubi (2020). The Green Purchase Intention scale was adopted from Paul et al. (2016), while the Green Purchase Behavior scale was cited from Lavuri and Susandy (2020). The Eco-Label scale was derived from Song et al. (2020).

All observed variables were measured using a 5-point Likert scale: (1) strongly disagree to (5) strongly agree.

Table 1. **Measurement Scales**

Scales	Symbol	Number of observations	Sources
Environmental Concern	EC	4	Rusyani et al. (2021)
Environmental Knowledge	EK	4	Wahid et al. (2011)
Environmental Attitude	EA	3	Bhattacharya (2019)
Health Consciousness	SK	4	Ghali-Zinoubi (2020)
Green purchase intention	YD	4	Paul et al. (2016)

Eco-Label	EL	3	Song et al. (2020)
Green purchase behavior	HV	4	Lavuri and Susandy (2020)
Price Sensitivity	NG	4	Ghali-Zinoubi (2020)

Source: own study

Table 1 presents a summary of the measurement scales for observed variables in the research model, including the construct names, coded indicators, number of observed variables, and sources of the scales.

3.3. Study Sample and Data Analysis Method

This study employed an online survey via Google Forms, utilizing a cross-sectional design and convenience sampling to collect the official research sample. The survey period lasted from September 2024 to November 2024. The Partial Least Squares Structural Equation Modeling (PLS-SEM) model was applied to analyze 300 valid responses collected from an initial sample of 398 observations in the online survey.

4. Results

4.1. Study Sample

Table 2. **Demographic characteristics of the study sample**

Characteristic		Frequency	Percentage (%)
Gender	Male	84	28.0
	Female	216	72.0
Age	18 – 25 years	236	78.7
	26 – 35 years	44	14.7
	36 – 45 years	10	3.3
	Over 45 years	10	3.3
Education Level	High school or below	9	3.0
	Intermediate Vocational Training	22	7.3
	College – University	248	82.7
	Postgraduate	21	7.0

Income	Below 199.36 USD	135	45.0
	239.23 – 398.72 USD	94	31.3
	438.60 – 797.45 USD	45	15.0
	Above 797.45 USD	26	8.7
Purchase Cost per Product	Below 7.97 USD	27	9.0
	7.97 – 19.94 USD	132	44.0
	19.94 – 39.87 USD	65	21.7
	Above 39.87 USD	76	25.3

Source: the authors' analysis results

Table 2 presents the descriptive statistics of the research sample, including gender, age, education level, income, and purchase cost per product.

Based on the data presented in the table, the distribution characteristics of the variables within the research sample are clearly observed. In terms of gender, males account for 28.0%, while females represent 72.0%. Regarding age, the majority of the research participants are in the 18-25 age group, comprising 78.7%, followed by the 26-35 age group at 14.7%, and the 36-45 and over 45 age groups, each accounting for 3.3%. In terms of education level, most participants have a college or university degree, representing 82.7%, followed by those with a vocational education and postgraduate degrees at 7.3% and 7%, respectively. Lastly, 3.0% of participants have education levels of high school or lower. In terms of income, those earning below 199.36 USD make up 45.0%, followed by those earning between 239.23 – 398.72 USD and 438.60 – 797.45 USD at 31.3% and 15.0%, respectively, with 8.7% earning above Above 797.45 USD. Regarding purchase cost per product, the majority of participants spend between 7.97 – 19.94 USD, accounting for 44.0%, followed by those spending over 39.87 USD and between 19.94 – 39.87 USD at 25.3% and 21.7%, respectively, with 9.0% spending below 7.97 USD.

4.2. Measurement Model

The study evaluated the consistency and reliability of the variables through statistical indicators such as Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE). Table 3 shows that the overall Cronbach's Alpha coefficient is > 0.7, with the lowest value being 0.724. Additionally, the composite reliability of the variables is > 0.7, with the smallest value being 0.863, indicating that the variables ensure internal consistency reliability (Hair et al., 2019; Hulland, 1999; Nunnally &

Bernstein, 1994). Moreover, the Average Variance Extracted (AVE) ranges from 0.678 to 0.832, which is > 0.5 (Hair Jr et al., 2014), ensuring that the scales converge to the factors they represent.

Table 3. **An Assessment of Measurement Model**

Variable	Items	Outer Loading	Cronbach's Alpha	Composite Reliability	Average variance extracted (AVE)
EA	EA1	0.927	0.899	0.937	0.832
	EA2	0.914			
	EA3	0.895			
EC	EC1	0.890	0.886	0.921	0.745
	EC2	0.843			
	EC3	0.837			
	EC4	0.882			
EK	EK1	0.827	0.863	0.906	0.708
	EK2	0.849			
	EK3	0.849			
	EK4	0.839			
EL	EL1	0.884	0.764	0.863	0.678
	EL2	0.814			
	EL3	0.768			
HV	HV1	0.874	0.913	0.939	0.793
	HV2	0.888			
	HV3	0.871			
	HV4	0.927			
NG	NG1	0.865	0.872	0.912	0.722
	NG2	0.845			
	NG3	0.831			
	NG4	0.857			

SK	SK1	0.878	0.890	0.924	0.752
	SK2	0.855			
	SK3	0.868			
	SK4	0.868			
YD	YD1	0.821	0.868	0.910	0.717
	YD2	0.842			
	YD3	0.910			
	YD4	0.811			

Source: the author's analysis results

In Table 3, the outer loading coefficients range from 0.768 to 0.927, clearly demonstrating the link between the observed variables and the latent constructs in the research model. This result indicates the fit with the criteria set by Hair et al. (2019). Moreover, all the scales meet the criteria for Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE), confirming the validity of the measurement structure and laying a solid foundation for the subsequent analysis.

Table 4. **Heterotrait-Monotrait Ratio (HTMT) Discriminant Validity Test**

	EA	EC	EK	EL	HV	NG	SK	YD
EA								
EC	0.584							
EK	0.586	0.528						
EL	0.538	0.627	0.523					
HV	0.691	0.740	0.772	0.773				
NG	0.424	0.446	0.559	0.418	0.640			
SK	0.414	0.432	0.420	0.293	0.438	0.161		
YD	0.689	0.615	0.587	0.586	0.805	0.540	0.549	

Source: the author's analysis results

In Table 4, the HTMT analysis results show that all constructs in the model achieve discriminant validity (HTMT < 0.85), meeting the proposed standard by Henseler et al. (2015). This allows for the next step of analysis.

4.3. Structural Model Evaluation

Figure 2 presents the results of the model estimation, using the bootstrap method with 5,000 subsamples and a 95% confidence level.

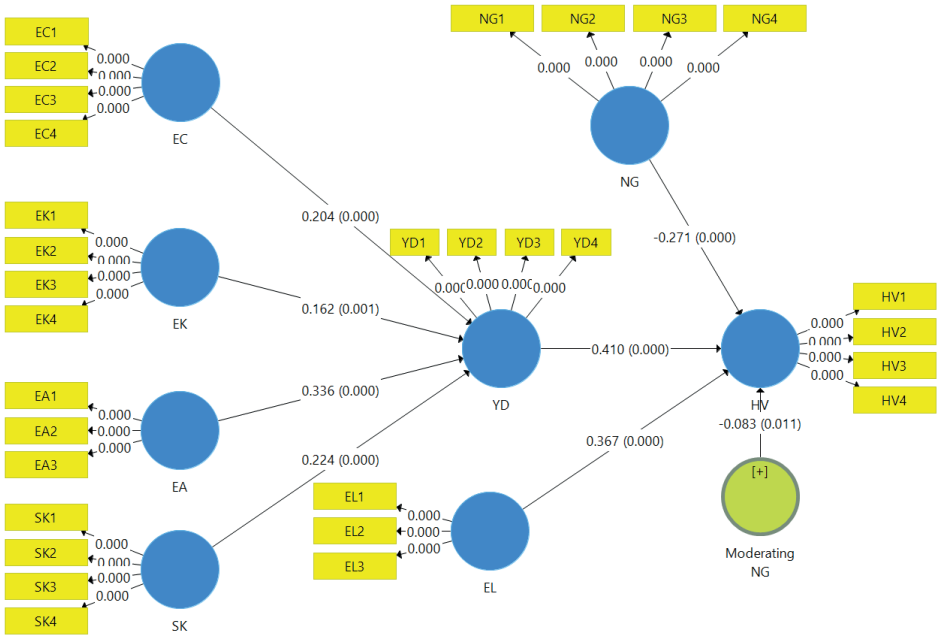

Figure 2. **Results of PLS-Smart Testing**

Source: the authors' analysis results

The results in Table 5 show that all hypotheses are statistically significant ($p < 0.05$). Furthermore, the positive signs of the path coefficients indicate a positive relationship between the variables, meaning that as the independent variables increase, the dependent variables also tend to increase. With the exception of hypothesis H7, the original sample (O) exhibits a negative moderating effect of price sensitivity on both green purchasing intention and green purchasing behavior. The Stone-Geisser (Q^2) and R^2 indices are used to assess the quality of the proposed model. The R^2 value for environmental behavior ($R^2HV = 0.696$) and $Q^2HV = 0.541$ show that the model has relatively good predictive accuracy. Furthermore, the f^2 values for green purchase intention ($f^2YD = 0.357$) and

environmental attitude ($f^2EL = 0.325$) indicate that the relationships between the variables in the model are reliable (Hair Jr et al., 2014).

Table 5. **Path coefficients of the hypotheses**

Hypotheses	Paths	Original sample (O)	*T* statistics (|O/STDEV|)	*P* values
H1	YD ⟶ HV	0.410	8.677	0.000
H2a	EC ⟶ YD	0.204	4.747	0.000
H2b	EC ⟶ HV	0.084	4.957	0.000
H3a	EK ⟶ YD	0.162	3.220	0.001
H3b	EK ⟶ HV	0.066	2.995	0.003
H4a	EA ⟶ YD	0.336	6.484	0.000
H4b	EA ⟶ HV	0.138	5.110	0.000
H5a	SK ⟶ YD	0.224	5.427	0.000
H5b	SK ⟶ HV	0.092	4.630	0.000
H6a	EC ⟶ YD ⟶ HV	0.084	4.354	0.000
H6b	EK ⟶ YD ⟶ HV	0.066	2.839	0.005
H6c	EA ⟶ YD ⟶ HV	0.138	5.010	0.000
H6d	SK ⟶ YD ⟶ HV	0.092	4.913	0.000
H7	NG ⟶ HV	-0.271	4.978	0.005
	Moderating NG	-0.083	2.594	0.019
H8	EL ⟶ HV	0.367	9.086	0.000
R^2	$R^2_{YD} = 0.509$; $R^2_{HV} = 0.696$			
Stone-Geisser's Q	$Q^2_{YD} = 0.352$; $Q^2_{HV} = 0.541$			
f^2	$f^2_{YD} = 0.357$; $f^2_{EL} = 0.325$			

Source: the authors' analysis results

The results indicate that environmental concern positively affects green purchase intention and green purchase behavior (H2a: β EC→YD = 0.204, p-values = 0.000 < 0.05; H2b: β EC→HV = 0.084, p-values = 0.000 < 0.05;), similarly, environmental knowledge positively affects green purchase intention and green purchase behavior (H3a: β EK→YD = 0.162, p-values = 0.001 < 0.05; H3b: βEK→HV = 0.066, p-values = 0.003 < 0.05), followed by environmental attitude positively affecting green purchase intention and green purchase behavior (H4a: β EA→YD = 0.336, p-values = 0.000 < 0.05; H4b: β EA→HV = 0.138, p-values = 0.000 < 0.05), then health consciousness positively affects green purchase intention and green purchase behavior (H5a: β SK→YD = 0.224, p-values = 0.000 < 0.05; H5b: β SK→HV = 0.092, p-values = 0.000 < 0.05), and finally, Eco-Label positively affects green purchase behavior (H8: β EL→HV = 0.367; p-values = 0.000 < 0.05).

5. Discussion

After the authors used software to test the hypotheses, all variables in the proposed model were found to be statistically significant (p < 0.05), thus the hypotheses H1–H7 were all accepted.

Hypothesis H1: Green purchase intention positively affects green cosmetic purchase behavior is accepted. This means that when the green purchase intention increases by 1 unit, the likelihood of consumers engaging in the buying behavior increases by 0.410 units, assuming all other factors remain unchanged. This finding aligns with TRA theory (Fishbein & Ajzen, 1977) and TPB theory (Ajzen, 1991). Furthermore, several previous studies have shown consistency in the viewpoint on the role of green purchase intention in influencing green purchase behavior, such as those by Phan et al. (2023), Hoang et al. (2018), and Ghali-Zinoubi (2020). They all agree that green purchase intention is positively related to green purchase behavior. Thus, it can be concluded that these studies demonstrate that green purchase intention is an important factor driving individuals' green purchase behavior.

Hypothesis H2a: Environmental concern (EC) positively affects the intention to purchase green products, and this hypothesis is accepted. This means that when environmental concern increases by 1 unit, the likelihood of consumers having a green purchasing intention increases by 0.204 units, assuming all other factors remain unchanged. This result is in line with previous studies such as Hoang et al. (2018); Yue et al. (2020), and Nguyen et al. (2021), which all share the view that EC is positively related to green purchase intention. Therefore, this study further confirms the relationship between EC and green purchase intention.

Hypothesis H3a: Environmental knowledge (EK) positively affects the intention to purchase green products, and this hypothesis is accepted. This means that when environmental knowledge increases by 1 unit, the likelihood of consumers having

a green purchasing intention increases by 0.162 units, assuming all other factors remain unchanged. Studies such as Lee (2017), Rusyani et al. (2021), and Le (2022) also demonstrate that EK has a direct and positive impact on individuals' green purchase intention. This result explains that consumers with more EK tend to have a higher green purchase consumption intention.

Hypothesis H4a: Environmental attitude (EA) positively affects the intention to purchase green products, and this hypothesis is accepted. This means that when environmental attitude increases by 1 unit, the likelihood of consumers having a green purchasing intention increases by 0.336 units, assuming all other factors remain unchanged. Numerous studies, such as Wesley et al. (2012), Nagar (2015), and Esmaeilpour and Bahmiary (2017), also argue that EA positively impacts green purchase intention. This explains that individuals with a positive EA are more likely to engage in green purchases.

Hypothesis H5a: Health consciousness positively affects the intention to purchase green products, and this hypothesis is accepted. This means that when health consciousness increases by 1 unit, the likelihood of consumers having a green purchasing intention increases by 0.224 units, assuming all other factors remain unchanged. This result is consistent with studies by Ghali-Zinoubi (2020) and Phan et al. (2023), which also agree on the positive relationship between health consciousness and green purchase intention. This highlights that when individuals are more aware of health concerns, they are more likely to engage in green purchases.

Hypothesis H7: Price sensitivity moderates the relationship between green purchase intention and green cosmetic purchase behavior, and this hypothesis is accepted. This means that when price sensitivity increases by 1 unit, it will reduce the positive relationship between green purchase intention and green cosmetic purchase behavior by 0.083 units, assuming all other factors remain unchanged. This result is consistent with the pioneering studies by Ghali-Zinoubi (2020). Moreover, Ghali-Zinoubi (2020) also showed that consumers are not only sensitive to the high price of green products but also unable to afford them. This finding supports consumer behavior prediction theories such as TRA (Fishbein & Ajzen, 1977) and TPB (Ajzen, 1991) in the context of green products. Specifically, the authors found a significant moderating relationship between price sensitivity and the link between intention and green purchase behavior, aligning with the results of Minbashrazgah et al. (2017). This suggests that consumers less sensitive to price tend to purchase green products more.

Hypothesis H8: Eco-label has a positive impact on green purchase behavior, and this hypothesis is accepted. This means that when the eco-label increases by 1 unit, the likelihood of consumers engaging in green purchase behavior increases by 0.367 units, assuming all other factors remain unchanged. Studies such as Sewwandi and Dinesha (2022) and Bautista et al. (2023) also agree on the positive relationship between eco-label and green purchase behavior. This suggests that when consumers have more knowledge

about eco-labels and when businesses or governments support and promote eco-labels, green purchase behavior is enhanced.

6. Conclusion

Vietnam, as a developing nation in transition towards a green economy, necessitates research into the influence of environmental factors on consumer green purchasing behavior. This study investigates these factors, demonstrating the strong utility of the extended Theory of Planned Behavior (TPB) in the current context. Furthermore, it elucidates the factors influencing consumer green product purchases. In the emerging market of Vietnam, despite positive perceptions of environmentally friendly products, environmental concern, knowledge, and attitudes remain limited. This may stem from a lack of strong pro-environmental actions and a less profound connection with nature among consumers.

The research suggests that managers should raise public awareness of environmental issues while emphasizing individual responsibility in environmental protection. Additionally, the findings affirm the role of factors such as environmental concern, environmental knowledge, and environmental attitudes in promoting Green Purchasing Behavior (GPB) through Green Purchasing Intention (GPI). The significant impact of eco-labels on GPB is also confirmed. Notably, a deeper exploration of the moderating role of price sensitivity reveals its potential influence on the relationship between GPI and GPB. These findings hold significant implications for managers in developing effective strategies to encourage sustainable consumption.

The study further emphasizes that sustainable practices and purchasing should become ingrained in the mindset, identity, and beliefs of society as a whole. Individuals need to actively participate in environmental protection activities and demonstrate greater responsibility through their choice of environmentally friendly products.

In conclusion, this research provides valuable insights into green consumer behavior and its influencing factors, thereby assisting managers and policymakers in formulating effective strategies to promote sustainable consumption and environmental protection.

7. Implications

7.1. Theoretical implications

The article is based on Ajzen's Theory of Planned Behavior (TPB) published in 1991 to build a model demonstrating the relationship between factors influencing green purchasing intentions (YĐTD xanh) and green purchasing behaviors (HVTD xanh) of consumers, and to test the moderating role of price sensitivity. However, psychological

and environmental awareness factors have been added to the theory by the authors, which helps to better understand human behavior. Therefore, this study contributes to the existing body of knowledge in the field of green marketing in the context of green economic transition in Vietnam.

This research primarily helps future scholars understand the factors influencing green consumer behavior in Vietnam. It contributes to understanding how young people approach and accept green products, avoiding negative environmental impacts.

In the study, EA was found to be the strongest factor in predicting consumers' green purchasing intentions, followed by HC with a regression coefficient of $\beta = 0.224$, EC with $\beta = 0.204$, and finally EK with $\beta = 0.162$. Moreover, these factors strongly influence the prediction of green cosmetic purchasing behavior in Vietnam, ranked as EA, SK, EC, and EK, respectively. However, YD and EL were the two strongest factors influencing behavior, with $\beta = 0.410$ and $\beta = 0.367$. Furthermore, price sensitivity had a negative regression coefficient in the relationship NG→HV ($\beta = -0.271$) and as a moderating factor in green purchasing intentions and green cosmetic purchasing behavior ($\beta = -0.083$).

The findings of this study shed light on several aspects to promote green purchasing behavior. Furthermore, it is essential to enhance environmental knowledge (EK) within the community through environmental education programs, and businesses need to adopt appropriate pricing strategies to mitigate price sensitivity.

The measurement scale developed in this study is not just a fixed tool but also a flexible framework that can be adjusted and expanded to suit various studies. This will facilitate researchers in exploring and gaining a deeper understanding of the research concepts in the context of Vietnam.

7.2. Managerial implications

Since the outbreak of the COVID-19 pandemic in Vietnam in 2019, people have become increasingly concerned about their health and the living environment. They have recognized the importance of health and a green living environment. A notable example is the air quality in the final months of 2023 in major cities in Vietnam, which was very poor, often experiencing "haze" due to air pollution (Nguyen et al., 2023a). This has made people more aware of behaviors to prevent further environmental degradation. The empirical analysis from this study shows that consumers in Vietnam can shift from conventional products to eco-friendly and environmentally protective products by enhancing their awareness of eco-labels, environmental concerns, environmental knowledge, environmental attitudes, and health consciousness. Furthermore, the moderating effect of price sensitivity on the relationship between green consumption intentions and behavior was observed. Price sensitivity can either reduce or increase the link between intention and actual green consumption behavior. Therefore, managers

and green organizations can design effective pricing strategies to encourage consumers to purchase green products and foster sustainable consumption habits, thus minimizing price sensitivity.

Additionally, this study highlights that emphasizing environmental values can help green businesses not only attract but also retain customers, while gaining a competitive advantage in the market. The findings underscore the strong correlation between environmental factors and consumers' green purchasing intentions and behaviors. Managers should actively promote green purchasing intentions and behaviors, encouraging consumers to choose green products to achieve economic and commercial benefits, enhance the company's image, and demonstrate responsiveness to environmental issues. Today, consumers are becoming more aware of their responsibility toward the environment and expressing this commitment through specific actions. Therefore, marketing strategies should prioritize customer-centric approaches, focusing on environmental responsibility and sustainable green shopping activities, alongside product pricing, to achieve optimal sales outcomes.

7.3. Future Research

Although the study offers significant academic and practical contributions, there are still some limitations that remain. First, the study focuses only on green cosmetics, so it cannot generalize the green purchase behavior across the country. Second, the accuracy of the collected data may be influenced by factors such as the reliability of participants, misunderstandings of the questions, and social desirability bias in responses. Third, despite the effort to synthesize related literature, there is still a certain knowledge gap. There may be previous studies that were not included in the paper, which could affect the comprehensiveness of the research findings.

The data collection method used in this study was convenience sampling. Therefore, in future studies, researchers could use other sampling methods to assess the robustness of the current research results and expand their generalizability.

This study presents and tests the relationships between EC, EK, EA, and HC in relation to green consumption intentions, with EL as an independent variable influencing green consumption behavior, and green consumption intentions serving as a mediator to green consumption behavior. Additionally, price sensitivity plays a moderating role in the relationship between green consumption intentions and behavior through the SEM method. Thus, future research should consider other external factors that could influence the results, such as awareness of consequences (Al Mamun et al., 2023), environmental responsibility (Sharma et al., 2023), altruistic and egoistic values (Prakash et al., 2019) or sociodemographic factors, which could provide more practical insights for future studies and sharpen the understanding of green consumer behavior (Ogiemwonyi et al., 2019). Furthermore, other theories,

such as psychological theories of consumer choice and attitude-behavior context (ABC) theory, could be utilized to gain a deeper understanding of green purchasing behavior among consumers.

Acknowledgment

Sincere thanks to the Industrial University of Ho Chi Minh City (IUH) for funding and supporting during the implementation of this research. The valuable support from the university has been a significant motivation, enabling the successful completion of this article.

Authors' contribution

T.N.N.: article conception, theoretical content of the article, research methods applied, conducting the research, data collection. **M.D.T.P.:** analysis and interpretation of results, draft manuscript preparation.

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