Exploring Green Consumption Intention-Behavior Gap in Vietnam: An Extended TPB Approach

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Abstract. This study analyzed factors influencing green consumption intention and behavior among 350 consumers in Vietnam using structural equation modeling. Drawing on an extended theory of planned behavior model, the impacts of attitude, subjective norms, perceived behavioral control, perceived effectiveness, trust, and green product availability on green consumption intention and actual behavior were assessed. The results showed attitude, perceived behavioral control, perceived effectiveness, and trust positively influenced green consumption intention. Green product availability negatively moderated the intention-behavior relationship. However, subjective norms had no significant effect on intention. The findings provide useful insights into leveraging consumers' internal motivations and external drivers to promote green consumption in Vietnam's rapidly developing economy. Further research should explore additional barriers inhibiting green purchase behaviors.

Keywords: Green product, Green consumption, Green product rarity, Intention, Behavior, Theory of planned behavior (TPB)

1. Introduction

The environment is currently undergoing extensive damage and ecosystem alterations, thereby exposing humanity to unforeseeable perils. These manifestations include phenomena such as global warming and the diminishing biodiversity of plant and animal species (Chen & Chai, 2010). According to the body of literature concerning the root causes of adverse environmental repercussions, overall economic growth, and the specific escalation of consumption, are identified as prominent factors leading to the depletion of natural resources (Abbasi et al., 2021). Fundamentally, consumption lies at the nucleus of economic development, where endeavors to innovate products, convey information, and compete for market share are all geared towards steering consumer behavior. Regrettably, manufacturers and businesses often disregard the rectification of the consequences stemming from resource exploitation, thereby leaving behind substantial environmental detriments (Tolstoy et al., 2022). Acknowledging this predicament, nations have invested significant efforts into promoting sustainable development, with the aim of achieving equilibrium between economic advancement and environmental preservation (Zhao et al., 2022). The accomplishments stemming from sustainable development promotion strategies have yielded innovative ecological consequences, characterized by the amalgamation of environmentally sustainable applications and methodologies throughout the entire lifecycle of goods and services production (Veleva & Ellenbecker, 2001).

The study of green consumer behavior in Vietnam is motivated by the imperative of sustainable development, particularly in the context of sustainable consumption. Issues related to environmental concerns, natural resource depletion, and their associated human health impacts underscore the need for a transition to more responsible consumption patterns (Lykogianni et al., 2021). While sustainable consumption is a critical aspect, "green consumption" stands out as a more widely recognized concept. It has gained prominence in developed nations and is beginning to take root in developing countries, driven by rising personal incomes and increasing consumer awareness (Destek & Sinha, 2020).

The growing willingness of individuals to pay a premium for eco-friendly products reflects the expanding market for environmentally conscious goods (Laroche, Bergeron, & Barbaro-Forleo, 2001). The significance of green consumption extends to both governments and the economy, creating a substantial and lucrative market across various customer segments. Notably, businesses entering this market receive support and encouragement from national governments, as highlighted by Cuervo-Cazurra and Li (2021). The progress in promoting green product manufacturing has achieved significant milestones, and consumers are gradually recognizing the role of green consumption and the imperative to adapt their consumption behavior to align with sustainability goals. This paper seeks to delve into the specific dynamics and gaps in green consumer behavior within the context of Vietnam.

The market is trending towards promoting green consumption based on consumers' concern for the environmental impact of products and their choices of goods that are least harmful to the environment (Muldoon, 2006). The influence of environmental protection slogans has indeed made a certain mark on the business of green products (Fahim & Mahadi, 2022). However, the market shows signs of stagnation despite abundant demand and ample supply. One of the reasons for this issue is a lack of deep understanding of consumers' inner motivations by businesses. Relying on the advantage of environmental protection slogans or government support has caused businesses to overlook the significance of anticipating customer consumption behaviors (Allal-Chérif et al., 2023). Consequently, green consumer behavior needs to be analyzed and interpreted more comprehensively.

According to Ajzen (1991), behavioral intention is a robust predictor of actual behavior, and purchase intention is a significant indicator of purchasing decisions. However, businesses often struggle to translate these intentions into real purchases, with price sensitivity frequently acting as a major impediment in various contexts, as noted by Yadav and Pathak (2017). In light of Vietnam's economic development, green consumption is on the rise, accompanied by a growing willingness among consumers to invest in eco-friendly products (Morone et al., 2021). Therefore, the primary objective of

this study is to explore the impact of the 'unavailability' context factor and its interplay with intrinsic and extrinsic factors within the framework of the theory of planned behavior. This research aims to provide a comprehensive understanding of the formation of green consumer behavior, and it also seeks to evaluate the multifaceted aspects of green consumer behavior.

2. Literature Review

2.1. Key Concepts

Green Consumption

Green products are environmentally friendly items that do not contribute to pollution or harm natural resources (Vazifehdoust et al., 2013). In a broader sense, they encompass products that ensure environmental friendliness throughout their lifecycle, from production to consumption (Elkingto, 1994). Green consumption refers to the act of purchasing environmentally friendly products (Al-Quran et al., 2020). Alfredsson (2004) relates green consumption to scientific indicators like energy use and CO_2 emissions. From a psychological standpoint, Jaiswal et al. (2021) define green consumption as the willingness to purchase eco-friendly products with minimal environmental impact in terms of ingredients and production methods.

Green Consumption Intention and Behavior

Consumer intention reflects consumers' beliefs regarding a sequence of consumption behaviors (Ajzen & Fishbein, 2004). According to Ajzen (1985), it represents an individual's motivation to engage in specific behaviors as part of their plans or decisions. Ajzen (2002) considers behavioral intention as a precursor to actual behavior. It signifies an individual's readiness to carry out a predetermined behavior. In the context of green consumption, the intention to engage in eco-friendly purchasing is a key indicator of future environmentally conscious buying actions (Armstrong, 2000). Concepts related to green consumer behavior are primarily rooted in the domains of consumer behavior and green products. Green purchasing behavior involves consuming products that benefit the environment, are recyclable, and address ecological concerns (Djaelani, Negari, & Cuaca, 2020).

2.2. Theoretical Framework

Theory of Planned Behavior

The Theory of Planned Behavior (TPB), introduced by Ajzen (1991), extends the Theory of Reasoned Action (TRA) by including an additional variable, "perceived behavioral control," representing the resources required for task execution. Planned behavioral intention is measured through an individual's attitude, subjective norms, and perceived behavioral control. In this context, a more favorable attitude, stronger subjective norms, and enhanced perceived behavioral control lead to a greater intention to perform a specific behavior (Ajzen, 1991).

Theory of Consumer Behavior

Consumer behavior, as described by Kotler (2001), aims to answer questions about why customers make purchases, how, when, and with what intensity they consume. Contemporary consumer behavior theory increasingly emphasizes emotional and value-based factors. It combines subjective and macro factors, with objective factors stemming from the marketing process, macroeconomic elements, and societal influences, while subjective factors relate to psychological attributes, such as motivations, perceptions, learning, and beliefs. Individual factors include age, life stage, occupation, economic status, and personal lifestyle. A combined analysis of these criteria provides a comprehensive understanding of consumer behavior.

Thus, this study adopts an integrated framework that combines Kotler's (2001) consumer behavior theory with Ajzen's (1991) TPB to elucidate green consumer behavior. This expanded framework offers

a more holistic perspective, emphasizing individual perceptual factors. By synthesizing existing literature, the study aims to identify gaps in empirical evidence related to the factors influencing green consumption intention and behavior, providing a rationale for the following hypotheses.

2.3. Research Hypotheses

Attitude toward Green Consumption

Attitude toward behavior is understood as an individual's positive or negative feelings about performing a specific action (Ajzen & Fishbein, 1980). In consumer behavior studies, attitude is considered a representation of what consumers like or dislike (Altmann, 2008), and consumers' purchasing decisions often rely on their attitudes toward products and the environment (Schwepker & Cornwell, 1991). Previous research has indicated the positive impact of attitude on green consumption and the intention to engage in such behavior (Chan, 2001). The research findings of Stanislawski et al. (2013) have shown that, for all selected candidates, an individual's attitude toward green consumption is the most influential factor on their intention to engage in green consumption. Therefore, the following hypothesis is proposed:

H1. Consumer attitudes towards green consumption have a positive influence on the intention to engage in green consumption.

Subjective Norms

Ajzen (1991) defines subjective norms or social influence as the individual's perception of the beliefs held by influential people about whether the individual should or should not engage in a behavior. Subjective norms can be described as an individual's perception of the social pressures regarding whether to perform or not perform a particular behavior. It encompasses the individual's awareness of the societal expectations and influences on their decision to engage in a specific behavior.

According to Fishbein & Ajzen (1975), subjective norms can be shaped through an individual's perception of normative beliefs from influential people or social factors that influence the consumer (such as family, friends, colleagues, media, etc.). The impact of these normative belief factors on consumer purchasing tendencies depends on (1) the level of support/opposition from influential individuals regarding the consumer's purchases and (2) the motivation of the consumer to comply with the wishes of those who have influence. Liu et al. (2020) also found that social factors, such as family and societal influence, are significant sources affecting interest in green products. Therefore, the following hypothesis is proposed:

H2. Subjective norms have a positive influence on the intention to engage in green consumption.

Perceived Behavioral Control

Perceived behavioral control is understood as an individual's perception of how easy or difficult it is to perform a behavior. It represents the perceived level of control over carrying out the behavior rather than the outcome of the behavior itself. In the context of green consumption, perceived behavioral control describes an individual's perception of the availability of necessary resources, barriers, and the ease with which they can engage in green consumption practices. It reflects their assessment of the factors that may facilitate or hinder their ability to adopt environmentally friendly behaviors.

According to Ajzen (1991), perceived behavioral control directly influences the behavioral intention, and when the individual accurately perceives their level of control, it can also predict the behavior itself. Some researchers, such as Sreen et al. (2018), have explored this area and argued that individuals who are environmentally conscious will only exhibit environmentally friendly behaviors if they perceive that individual actions can contribute to addressing broader environmental issues. The effectiveness of eco-conscious consumer behavior is analogous to perceived behavioral control (PBC) (Chaudhary & Bisai, 2018). Therefore, the proposed research hypothesis is as follows:

H3. Perceived behavioral control has a positive influence on the intention to engage in green consumption.

Perceived Effectiveness and Intention for Green Consumption

Perceived consumer effectiveness (PCE) is the belief that individual efforts can make a difference in solving a problem (González, 2015). According to Roberts (1996), "The more people believe they can address environmental resource issues, the more likely they are to engage in environmentally conscious consumer behaviors". PCE is a psychological variable that explains the awareness of ecologically responsible behavior. Numerous studies have shown a positive correlation between perceived consumer effectiveness and the intention to purchase green products (Emekci, 2019). Therefore, the proposed research hypothesis is:

H4. Perceived consumer effectiveness positively influences the intention for green consumption.

Trust in Green Consumption

Trust can be understood as "an individual's or entity's confidence in the committed outcome" (Berg et al., 2009). From another perspective, trust is a psychological state that involves a willingness to accept vulnerability based on positive expectations about the actions or behaviors of the trusted party. For example, consumers trust experts or research institutions in risk management and technology concerning genetically modified foods (Chen & Li, 2007). Online trust is the optimistic expectation of customers regarding product quality, often seen as "society's expectation in economic exchange". Schneider et al. (2009) argue that customer trust in organic food has a stimulating effect on the intention of green consumption in general. The proposed hypothesis is as follows:

H5. Trust in green consumption has a positive influence on the intention of green consumption.

Rarity of Green Products

In a study conducted by Gleim, Mark R., and colleagues (2013), the rarity of green products was shown to be a hindering factor in green consumption behavior. This implies the opposite, meaning that when green products are readily available in places where consumers frequently visit, consumers who have an intention to engage in green consumption may be more likely to carry out actual green consumption behavior. This is because green products being prominently displayed to consumers can trigger their memory of the pre-formed consumption situation. Research by Wang et al. (2020) on sustainable food consumption also pointed out that the availability of sustainable food along with the types of products available in the market are factors that can influence customers' purchasing behavior.

While green products are often concentrated in supermarkets or large retail supply chains, Vietnamese consumers still tend to shop at traditional markets. Additionally, the distribution of green products in these systems is not always guaranteed in terms of production sources, and supply chains can be fragmented, leading to inconsistent availability of green products. This visual factor can cause consumers to have the intention to purchase but be unable to carry out the purchase behavior or lack the patience to wait. Therefore, the proposed hypothesis is as follows:

H6. The rarity of green products has a negative impact on the relationship between intention and green consumption behavior.

Intention and Green Consumption Behavior

Consumer theory suggests that consumers go through an intention phase before making a purchasing decision, and there is a causal relationship between intention and behavior. In this context, the intention to consume acts as a precursor to consumption behavior. Ajzen and Fishbein (1980) also highlight that intention is a crucial and the best predictor of behavior. "A central factor in the theory of planned behavior is an individual's intention to perform a specific behavior" (Ajzen, 1991). Therefore, in this extended TPB model, the hypothesis is proposed as follows:

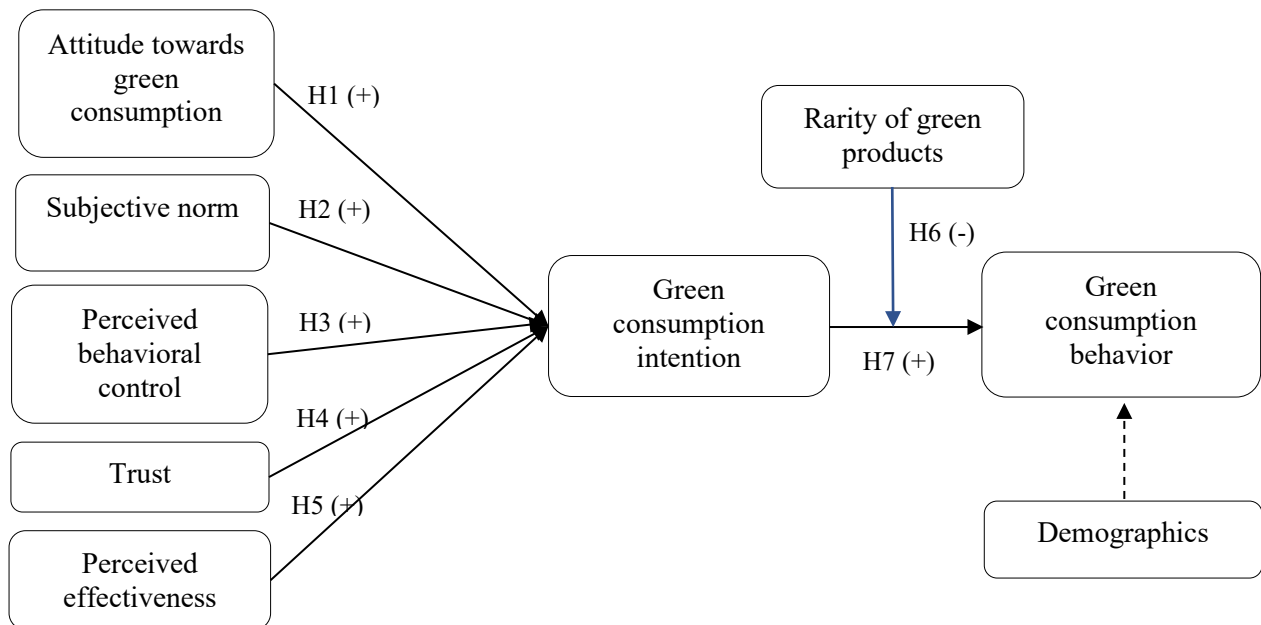*H7. Intention to engage in green consumption will have a positive impact on green consumption behavior.*

Fig.1: Research Model

2.4. Demographic Factors

Numerous studies have pointed out the factors influencing green consumer behavior, including environmental impact (Anderson & Cunningham, 1972; Webster, 1975), individual consumer characteristics (Kinnear, Taylor, & Ahmed, 1974), and socio-demographic characteristics (Diamantopoulos et al., 2003; Ngobo, 2010; Shrum, McCarty, & Lowrey, 1995). The higher the income of consumers, the stronger their intention to purchase green products (Cheng & Yang, 2001). Additionally, a positive correlation exists between the educational level of consumers and their green consumption behavior (Zeng et al., 2007).

In Diamantopoulos's (2003) study, the analysis results indicated significant relationships between demographic characteristics (age, gender, marital status, education level) and the purchase behavior of environmentally friendly products. According to the surveyed data, consumers who are over 35 years old, married with children, have higher educational levels, and are female tend to purchase environmentally friendly products more often. Furthermore, income levels and educational attainment also demonstrate differences in how individuals engage in green consumer behavior.

3. Methodology

3.1. Measurements

After constructing the research model, the measurement scales were adopted from previous studies to quantify each research concept. For the concept of attitude towards green consumption, three observed variables were drawn from Taylor and Todd (1995). Subjective norms were assessed using the five observed variables proposed by Ajzen (2002). The measurement scale for perceived behavioral control included five observed variables adopted from Hui-hui Zhao et al. (2012) and Berg et al. (2005). Perceived consumer effectiveness consisted of three items from Roberts (1996) and one item from Kim

(2011). Product availability was gauged using three items from Mark et al. (2013) and four items from Paul et al. (2016) for the concept of green purchase intention. Finally, the study incorporated three items from Wang (2017) for the green consumer behavior variable. Following in-depth interviews with experts, an additional item was developed for the green consumer behavior variable: "All appliances in my household are energy-saving products".

Measurement scales were adapted to align with the Vietnamese research context, ensuring cultural relevance. The survey questionnaire was meticulously developed using the Google Forms platform. To meet the prerequisites for structural equation modeling (SEM) analysis, a sample size exceeding the number of indicators was targeted. In accordance with the guidelines provided by Hair et al. (2019), which recommend a minimum of 200 respondents to meet SEM goodness-of-fit standards, 350 valid responses were collected to ensure robust data.

The survey development process involved a rigorous examination of the questionnaire's content, face validity, and construct validity. This process included pilot testing and expert reviews to ensure the reliability and validity of the measurement scales. A convenience sampling method was chosen due to its practical advantages.

3.2. Data Analysis

For data analysis, SPSS and AMOS software were employed to execute the SEM analysis, covering both the measurement and structural models. SEM was chosen for its suitability in investigating the intricate relationships between latent variables and observed indicators, aligning with the research objectives and hypotheses. Additionally, a demographic subgroup analysis will be conducted to identify potential variations in observed relationships based on participant characteristics.

4. Results

4.1. Sample Characteristics

The survey sample in this study can be considered quite representative of environmentally conscious consumers in Ho Chi Minh City. The basic demographics show that the age group of 30-39 is the largest, accounting for the highest percentage. Most respondents have a bachelor's degree, and a significant proportion falls into the moderate-income category. This accurately reflects the purchasing power of Vietnamese consumers, particularly young professionals. With 350 samples, including individuals aged 16 and above, predominantly young consumers (85.71%) and females (69.1%), the majority have a bachelor's degree or higher (over 80%) and earn an average income or higher.

Table 1. Sample Characteristics

Demographics		%	Demographics		%
Gender	Male	69.1	**Educational level**	High school or below	15
	Female	30.9		Bachelor	58
Age	Under 30	20.29		Postgraduate	27
	30-39	65.43	**Income (million VND)**	Below 5 - 10	29
	40-49	8		Above 10 - 15	29.1
	Above 50	6.28		Above 15 - 20	19
N	**350**	**100%**		Above 20	22.9

4.2. Measurement Reliability

Reliability is demonstrated through Cronbach's alpha coefficient. According to Hair and colleagues (2014), this coefficient should be greater than 0.7 to meet the reliability requirements for SEM testing. Therefore, all research concepts in the model meet the required reliability. However, the observed variable PI1 was excluded due to having a lower than 0.3 total variable correlation, and the Cronbach's

Alpha value after exclusion reached 0.814.

Table 2. Cronbach's Alpha

Factors	Cronbach's Alpha
Attitude towards Green Consumption	.757
Subjective Norms	.886
Perceived Behavioral Control	.880
Trust	.895
Perceived Effectiveness	.833
Availability of Green Products	.809
Intention for Green Consumption	.814
Green Consumption Behavior	.762

This study applied SEM to analyze and test hypotheses. Accordingly, the data were initially processed through exploratory factor analysis (EFA) using the SPSS software, followed by confirmatory factor analysis (CFA) using AMOS software. The initial exploratory factor analysis results indicated that PB4 was removed from the analysis due to not meeting the factor loading requirement (less than 0.5). After removing variable PB4, the Kaiser-Meyer-Olkin (KMO) measure was 0.790, and the Sig value of Bartlett's Test of Sphericity was 0.000, indicating that the observed variables in the study were interrelated and suitable for factor analysis with a 95% confidence level. These results suggest that the observed variables in the overall dataset were correlated with each other, and exploratory factor analysis (EFA) was appropriate.

The results after removing variable PB4 show that all the remaining variables have factor loadings greater than > 0.5 on their respective factors.

Table 3. Factor matrix after rotation (EFA round 2)

	Factor							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
SN4	.825							
SN1	.823							
SN5	.823							
SN2	.790							
SN3	.641							
PBC4		.869						
PBC1		.845						
PBC3		.822						
PBC5		.690						
PBC2		.635						
T3			.861					
T2			.847					
T4			.814					
T1			.781					
PCE2				.833				
PCE1				.779				
PCE4				.719				
PCE3				.650				
LOA1					.904			

LOA2					.715			
LOA3					.686			
PB2						.790		
PB1						.736		
PB3						.695		
A3							.829	
A2							.656	
A1							.650	
PI3								.833
PI4								.753
PI2								.654

The SEM analysis consists of two steps: Confirmatory Factor Analysis and Structural Equation Modeling. Next, the results of the CFA analysis show that this research model has acceptable values: $\chi^2/df = 1.617$ (<2) meeting the compatibility requirements, and other indices also meet the requirements: CFI = 0.945 (>0.9), GFI = 0.898 (≈0.9), TLI = 0.945 (>0.9), and RMSEA = 0.042 (<0.05). The measurement model is compatible with the empirical data.

The results of the CFA indicate that the regression weights of all observed variables are statistically significant at a 95% confidence level ($p < 0.05$). Therefore, all the concepts have achieved discriminant validity. This result is presented in Table 5.

The results have $p < 0.05$ for all variables, indicating statistical significance, which means all variables are correlated with the main factor.
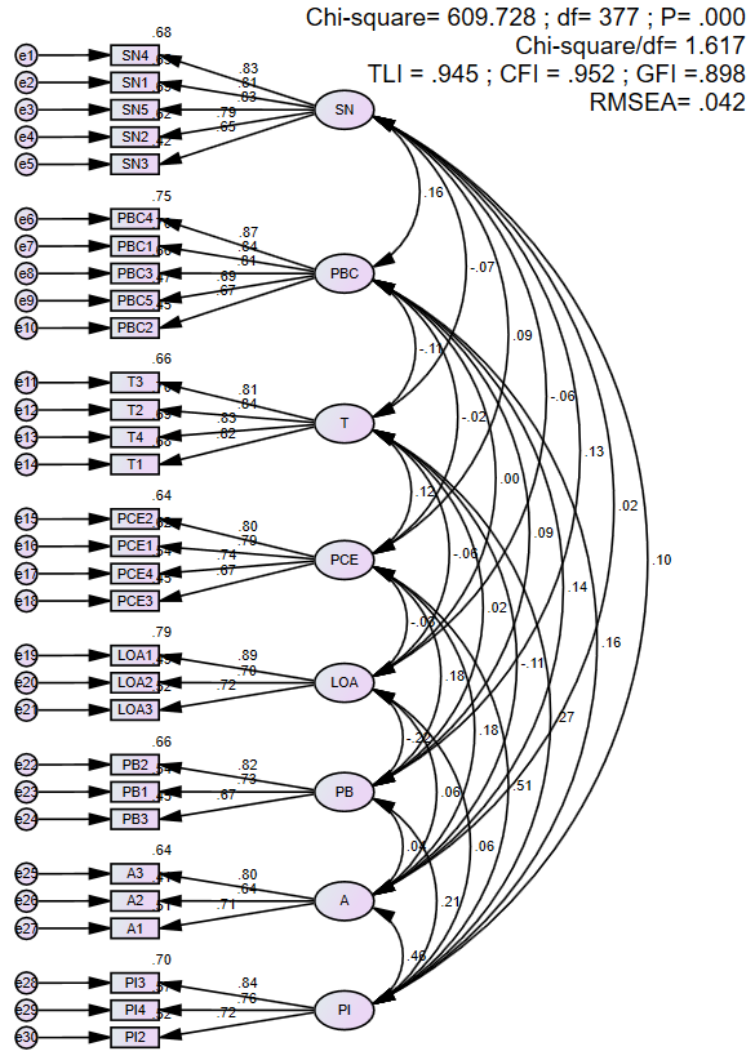
Fig. 2: CFA Analysis

Additionally, the standardized regression weights of the observed variables all meet the acceptable standard, as they are all greater than 0.5. Therefore, all measurement scales in this study achieve convergent validity, as shown in Table 4.

Table 4. Standardized Regression Weights

			Estimate				Estimate
SN4	<---	SN	.825	PCE1	<---	PCE	.785
SN1	<---	SN	.808	PCE4	<---	PCE	.738
SN5	<---	SN	.829	PCE3	<---	PCE	.674
SN2	<---	SN	.789	LOA1	<---	LOA	.886
SN3	<---	SN	.649	LOA2	<---	LOA	.702
PBC4	<---	PBC	.865	LOA3	<---	LOA	.720
PBC1	<---	PBC	.836	PB2	<---	PB	.815
PBC3	<---	PBC	.812	PB1	<---	PB	.732
PBC5	<---	PBC	.685	PB3	<---	PB	.673
PBC2	<---	PBC	.670	A3	<---	A	.799
T3	<---	T	.814	A2	<---	A	.637

			Estimate				Estimate
T2	<---	T	.837	A1	<---	A	.711
T4	<---	T	.832	PI3	<---	PI	.836
T1	<---	T	.823	PI4	<---	PI	.755
PCE2	<---	PCE	.797	PI2	<---	PI	.722

Composite Reliability and Variance Extracted

The coefficient of composite reliability (CR) is used to assess the reliability of the measurement of constructs as well as latent variables. In SEM, CR should be greater than 0.7. Table 5 shows that the minimum CR is 0.761, meeting the required level of reliability (Usakli & Rasoolimanesh, 2023). Furthermore, the Average Variance Extracted (AVE) is all greater than 0.5, indicating that the data meets the convergence requirement (Hair, 1998).

Table 5. Composite Reliability and Variance Extracted

	CR	AVE	MSV	MaxR (H)	SN	PBC	T	PCE	LOA	PB	A	PI
SN	0.887	0.613	0.026	0.896	**0.783**							
PBC	0.883	0.605	0.026	0.899	0.162	**0.778**						
T	0.896	0.683	0.073	0.896	-0.075	-0.108	**0.827**					
PCE	0.837	0.563	0.265	0.843	0.093	-0.02	0.119	**0.75**				
LOA	0.816	0.599	0.049	0.851	-0.062	-0.001	-0.062	-0.028	**0.774**			
PB	0.785	0.551	0.049	0.798	0.132	0.092	0.017	0.179	-0.222	**0.742**		
A	0.761	0.517	0.209	0.777	0.018	0.142	-0.113	0.181	0.059	0.044	**0.719**	
PI	0.816	0.597	0.265	0.826	0.104	0.160	0.270	0.515	0.059	0.208	0.457	**0.773**

Therefore, the CFA results have met the theoretical standards, confirming the reliability of the measurement scales in the model is good. It meets the conditions to proceed with SEM analysis.

4.3. Model and Hypothesis Testing

Testing without a Moderator Variable

In this section, a structural equation modelling (SEM) analysis is conducted to test the hypotheses proposed in the research model. The results of the SEM analysis produced the following fit indices: $\chi^2/df = 1.593$ (<2), meeting the requirement for compatibility. Additionally, other fit indices also met the requirements: CFI = 0.959 (>0.9), GFI = 0.907 (≈0.9), TLI = 0.953 (>0.9), and RMSEA = 0.041 (<0.05). These indices all meet the theoretical requirements (Hair et al., 1998). Therefore, it can be concluded that this linear structural equation model is suitable for the data collected from the market.
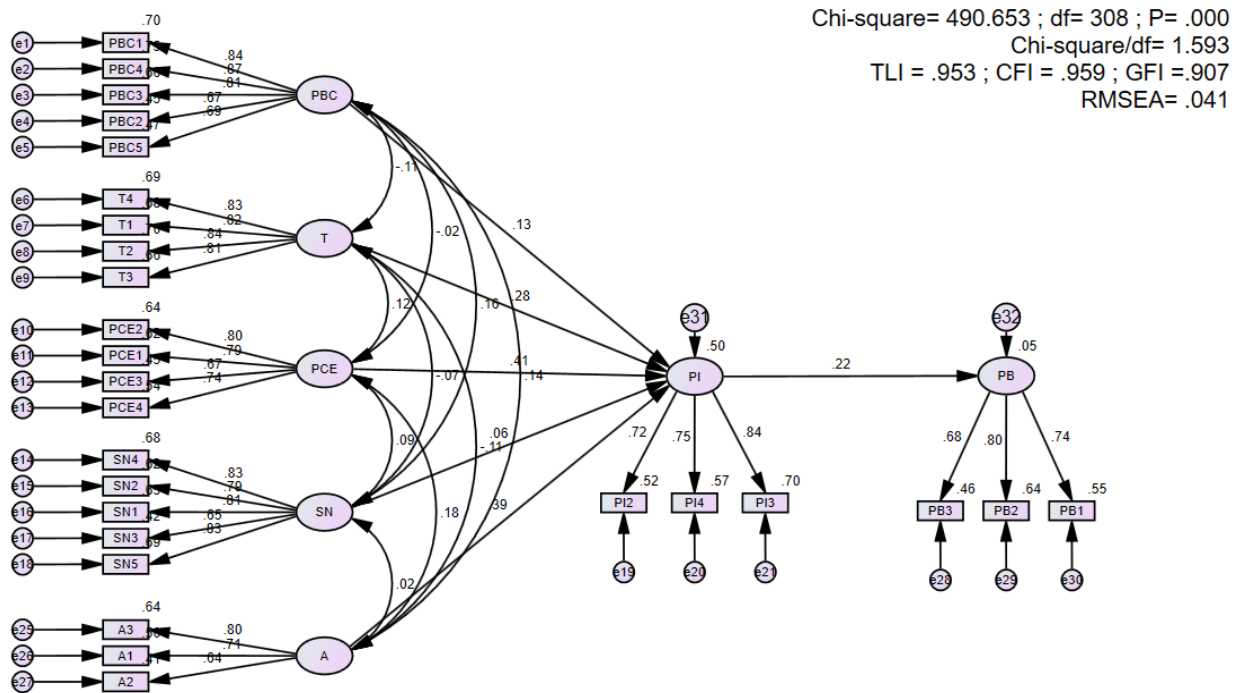
Fig. 3: Model without Moderator Variable

Hypothesis Testing

From the results in Table 6, the majority of the correlations in the research model are statistically significant ($p < 0.05$). The regression coefficient table serves as the basis for determining the strength of the relationships. Specifically, PCE has the largest impact on PI with the highest standardized regression coefficient of 0.410.

Table 6. Regression Weights

			Regression Weights	Standardized Regression Weights	S.E.	C.R.	p	Conclusion
PI	<---	PBC	.096	.135	.038	2.544	.011	Accepted
PI	<---	T	.191	.283	.037	5.124	***	Accepted
PI	<---	PCE	.266	.410	.040	6.695	***	Accepted
PI	<---	SN	.057	.063	.047	1.207	.227	Rejected
PI	<---	A	.236	.393	.039	6.078	***	Accepted
PB	<---	PI	.262	.217	.081	3.246	.001	Accepted

The model's goodness of fit is indicated by the R^2 coefficient, with PI being 0.495. This means that the 5 independent variables in the model explain 49.5% of the variance in the Intention of Green Consumption.

Bootstrap Testing

The Bootstrap test results in Table 7, with a sample size of 1000 bootstrap samples, show that the discrepancies between the estimates in the SEM model and the bootstrap estimates are very small. Therefore, it can be concluded that the estimates in the research model are highly reliable, and the research model fits the market dataset well.

Table 7. Bootstrap Analysis

			SE	SE-SE	Mean	Bias	SE-Bias	C.R.
PI	<---	PBC	0.063	0.001	0.134	-0.001	0.002	-0.5
PI	<---	T	0.054	0.001	0.286	0.003	0.002	1.5
PI	<---	PCE	0.06	0.001	0.406	-0.004	0.002	-2
PI	<---	SN	0.062	0.001	0.063	0.001	0.002	0.5
PI	<---	A	0.06	0.001	0.397	0.004	0.002	2
PB	<---	PI	0.07	0.002	0.215	-0.002	0.002	-1

Therefore, at a 95% confidence level, based on the results from Table 7, hypotheses H1, H3, H4, H5, and H7 are all accepted.

Testing with a Moderator Variable

The results of conducting the structural equation model (SEM) when there is a moderator variable, which is the availability of green products, yield the following values for the indicators at a 95% confidence level: $\chi^2/df = 2.598$ (<3), meeting compatibility requirements. CFI = 0.973 (>0.9). GFI = 0.989 (>0.95). TLI = 0.861 (>0.9). RMSEA = 0.068 (0.05-0.10 for the Moderator Variable). All of these indices meet the theoretical requirements (Hair et al., 1998).
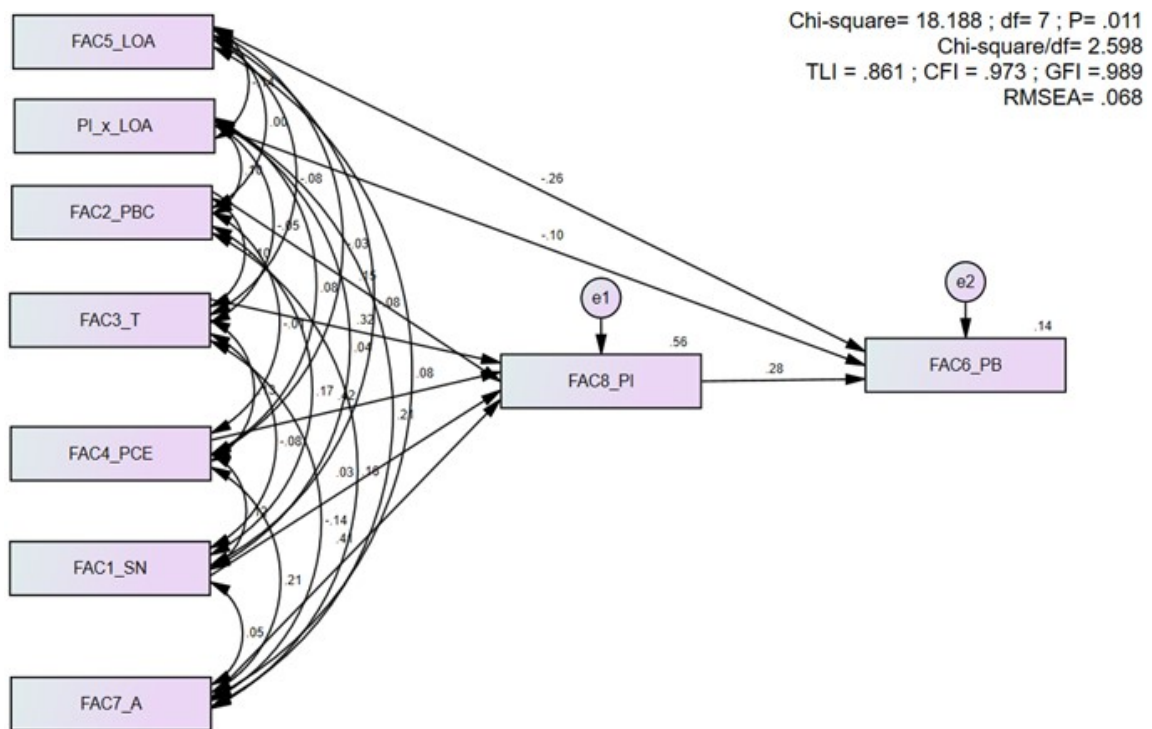

Fig.4: Model with Moderator Variable

The results in Table 8 indicate that the relationship between SN and PI in this case is still not accepted because the p-value is 0.431, which is greater than 0.05. However, all other relationships have p-values less than 0.05, so they are accepted.

Table 8. Regression Coefficients

		Regression Weights	Standardized Regression Weights	S.E.	C.R.	p
FAC8_PI <---	FAC2_PBC	.147	.152	.036	4.146	***
FAC8_PI <---	FAC3_T	.315	.324	.036	8.848	***
FAC8_PI <---	FAC4_PCE	.421	.422	.037	11.344	***
FAC8_PI <---	FAC1_SN	.028	.029	.036	.788	.431
FAC8_PI <---	FAC7_A	.421	.409	.038	10.954	***
FAC6_PB <---	FAC8_PI	.273	.279	.049	5.586	***
FAC6_PB <---	FAC5_LOA	-.247	-.255	.049	-5.092	***
FAC6_PB <---	PI_x_LOA	-.087	-.105	.042	-2.070	.038

The relationship between the rarity of green products (LOA) and green consumption behavior (PB), as well as the Moderator relationship (PIxLOA) to PB, both have negative regression coefficients, indicating a reverse effect on PB. H6 is accepted.

Multigroup Testing

After testing the hypotheses, the study proceeds to perform comparisons of the path coefficients among demographic criteria such as gender, age, education level, and income. Multigroup analysis is applied to examine whether pre-defined data groups exhibit significant differences in specific parameter estimates within their respective groups. The result indicates a significant difference at a 5% error probability level if the p-value is less than 0.05 or greater than 0.95 for a particular difference in the path coefficient of a specific group.

The p-value is $0.159 > 0.05$, so there is no difference between males and females when evaluating the SEM model. The p-value is 0.58, which is greater than 0.05, indicating that there is no significant difference between the age groups under 30 and over 30 when evaluating the SEM model. The p-value is 0.038, which is less than 0.05, indicating a difference between the groups with educational levels below college and those with college education and above when evaluating the SEM model, as follows:

Table 9. Differences among Education Groups

Relationship	Below Bachelor (Beta)	Bachelor and above (Beta)	Difference in Betas	p-value for Difference	Explanation
PBC → PI	0.123	0.134*	-0.011	0.781	Positive Relationship between PI and PBC is significant only for Bachelor's degree and above
T → PI	0.265*	0.303***	-0.038	0.521	No difference
PCE → PI	0.338*	0.419***	-0.081	0.551	No difference
SN → PI	-0.256†	0.136*	-0.393	0.004	Relationship between PI and SN is negative for below Bachelor's Degree and positive for Bachelor's degree and above
A → PI	0.390**	0.405***	-0.015	0.314	No difference

PI → PB	0.179	0.238***	-0.06	0.185	Positive Relationship between PB and PI is significant only for Bachelor's degree and above

The p-value is 0.013, which is less than 0.05, indicating a significant difference between the income groups (Income below 15 million VND and Income 15 million VND and above) during the evaluation of the SEM model, as follows:

Table 10. Differences among Income Groups

Relationship	Below 15 million (Beta)	15 million and above (Beta)	Difference in Betas	p-value for Difference	Explanation
PBC → PI	0.223**	-0.002	0.226	0.025	Positive relationship between PI and PBC is stronger for the below 15 million group
T → PI	0.287***	0.255***	0.032	0.645	No difference
PCE → PI	0.493***	0.306***	0.187	0.138	No difference
SN → PI	-0.021	0.175*	-0.195	0.059	Positive relationship between PI and SN is stronger for 15 million and above
A → PI	0.273***	0.545***	-0.272	0.008	Positive relationship between PI and A is stronger for 15 million and above
PI → PB	0.181*	0.267**	-0.086	0.29	No difference

5. Discussion

5.1. TPB Factors

The research findings reveal that the intention and actual green consumption behavior are influenced by the five factors within the research model. Notably, perceived effectiveness emerges as the most influential factor on the intention to engage in green consumption. This finding underscores that when green consumers possess a clear perception of the effectiveness of their actions, they are more likely to translate their intentions into actual green consumption behavior (Ajzen & Fishbein, 2005).

Furthermore, attitude demonstrates a positive influence on the intention to engage in green consumption (beta = 0.393), consistent with the results observed in the study by Tanner and Kast (2003). Perceived behavioral control also maintains a positive relationship with the intention to engage in green consumption. This factor reflects the ease of controlling the implementation of green consumption behavior, devoid of significant barriers, within the individual's control and resource capacity, including financial, temporal, and knowledge resources.

The research findings further reveal that consumer trust (beta = 0.283) in product quality, manufacturer credibility, and government control over product safety and its benefits for personal health and the community play a pivotal role in influencing green consumption consideration. These findings

align with the conclusions drawn from prior studies by Berg et al. (2005), Chen and Li (2007), Jokinen et al. (2011), and Schneider et al. (2009).

Conversely, the scarcity of green products demonstrates a negative effect on the relationship between intention and green consumption behavior. This suggests that as green products become more readily accessible, the positive relationship between intention and green consumption behavior becomes more robust. These results align with previous research, including Seyfang's (2006) assertion that local green food networks are essential for consumers to translate their intentions into actual green food purchasing behavior. Bonini and Oppenheim (2008) also emphasize that limitations in the availability of green products can impede green consumption behavior.

Regarding the subjective norm factor, this research presents an unexpected result, indicating that it does not significantly impact the intention for green consumption. This finding deviates from the typical findings in previous TPB-based studies, which often indicate the influence of subjective norms on intention. However, this result can be elucidated by the considerable increase in consumer autonomy in gathering information about green products, facilitated by the internet's development. Consequently, consumers may rely less on seeking information or being influenced by their social circles. This is substantiated by the observed positive effects of attitude and perceived behavioral control on intention. Nonetheless, further investigation across various contexts is warranted to validate this distinctive result.

5.2. Demographic Factors

According to the findings of this study, there are no discernible differences between gender and income groups when it comes to the transition from intention to behavior. Moreover, the research results indicate that there is an absence of disparities in green consumer behavior between age groups under 30 and those over 30.

Furthermore, this study offers valuable insights into the distinctions among educational groups regarding their intent to engage in green consumption. This observation is consistent with the inherent nature of green consumption, which encompasses environmentally responsible behaviors necessitating heightened environmental awareness and individual as well as communal well-being considerations.

In cases where education levels are on the rise, a significant impact on the correlation between intention and green consumer behavior becomes apparent. Conversely, when education levels are low, the influence of intention on green consumer behavior weakens. In simpler terms, when awareness levels decline, even if consumers possess the intention, their engagement in green consumption behavior may not necessarily materialize.

6. Conclusion

This study makes important theoretical and practical contributions by testing an integrated model of factors underlying green consumption intention and behavior in Vietnam. The findings demonstrate the roles of attitude, perceived control, perceived effectiveness, trust, and product availability in shaping consumers' eco-friendly purchases. The results imply strategies emphasizing environmental and health benefits, enhancing eco-product accessibility, and boosting consumer awareness may promote sustainable consumption. However, the self-reported data and non-random sampling limit generalizability. Future research should apply experimental designs to evaluate causal impacts of green marketing initiatives in this emerging economy. As Vietnam continues rapid development, understanding and encouraging sustainable consumer behaviors will be vital.

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