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The Path to Green Purchasing: How Environmental Beliefs and Skepticism Shape Consumer Intentions in the SDG12 Era

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ABSTRACT

Understanding the determinants of green purchase intention (GrePurInt) is critical in fostering sustainable consumption, particularly in alignment with Sustainable Development Goal 12 (SDG12). Despite growing awareness of sustainability, research on how consumer beliefs and skepticism influence GrePurInt in emerging economies remains limited. This study investigates the impact of environmental beliefs (EnvBeliefs) and perceived consumer effectiveness (PerConEff) on consumers' attitudes toward green products (AttGrePro) and their subsequent purchasing intentions. The moderating roles of environmental skepticism (EnvSkept) and personal motivation (PersMoti) are also examined to deepen understanding of how different psychological factors interact in shaping consumer decision-making.

PLS-SEM was used to analyse these associations in 592 Vietnamese consumers. AttGrePro and PerConEff, which boost GrePurInt, are considerably improved by EnvBeliefs. The AttGrePro-GrePurInt link is strengthened by EnvSkept, suggesting that sceptical consumers may make more careful purchases rather than rejecting green products. PersMoti does not significantly alter the PerConEff-GrePurInt connection, suggesting that legislative frameworks and corporate openness may be more important in fostering sustainable purchasing behaviour.

Evidence from Vietnam, a growing market, contributes to the worldwide conversation on sustainable consumer behaviour. Global firms and regulators seeking effective green consumption marketing and regulatory strategies may find the findings useful.

KEYWORDS: Environmental beliefs, Environmental skepticism, Green purchase intention, Personal motivation, SDG12, Sustainable consumption.

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INTRODUCTION

In recent years, growing environmental concerns have led to increasing global interest in sustainable consumption behaviors (Halder et al., 2020). Climate change, resource depletion, and environmental degradation have intensified discussions around the need for responsible consumption and production patterns (Thøgersen, 2011; Jackson, 2014; Gomes da Silva et al., 2020; Ng et al., 2024). In response, the United Nations Sustainable Development Goals (SDGs) provide a framework for promoting global sustainability, with SDG12: Responsible Consumption and Production playing a pivotal role in guiding consumer behavior toward more sustainable choices (Nations, 2023). SDG12 calls for a transformation in consumption patterns by reducing waste, improving resource efficiency, and encouraging businesses and individuals to adopt sustainable practices.

Vietnam, as a rapidly growing economy, is undergoing a shift in consumer preferences, with sustainability becoming a more prominent consideration in purchasing decisions (Nguyen et al., 2019). However, while there is an increasing awareness of sustainability, the actual adoption of green purchasing behaviors remains inconsistent (Cheung & To, 2019). Previous studies on green purchase intention (GrePurInt) have largely focused on psychological and attitudinal drivers, such as environmental beliefs (EnvBeliefs), perceived consumer effectiveness (PerConEff), and subjective norms (Ham et al., 2015; Kovacs & Keresztes, 2022; Aguilar-Rodríguez & Arias-Bolzmann, 2023; Duong et al., 2023; Pham et al., 2024). However, limited research has directly linked these factors to SDG12-driven initiatives in diverse cultural and economic contexts, particularly in emerging markets. Understanding how individual consumer behaviors align with macro-level sustainability objectives remains a critical research gap.

This study aims to fill this gap by investigating how environmental beliefs (EnvBeliefs) and perceived consumer effectiveness (PerConEff) influence GrePurInt in the context of SDG12. Additionally, this study explores the moderating effects of environmental skepticism (EnvSkept) and personal motivation (PersMoti), examining whether consumers' level of trust in sustainability claims and intrinsic motivations shape their purchasing decisions. Given the increasing emphasis on sustainability in global markets, this study offers insights not only for firms operating in Vietnam but also for multinational corporations

(MNCs), policymakers, and global marketers aiming to develop more effective green marketing strategies. Understanding how consumers in emerging economies engage with sustainability initiatives can help shape cross-national marketing campaigns, regulatory policies, and corporate sustainability programs that align with SDG12 objectives worldwide.

The theoretical foundation of this study relies on two widely recognized psychological and behavioral frameworks: the Theory of Planned Behavior (TPB) and the Value-Belief-Norm (VBN) Theory. These theories offer valuable insights into how individual beliefs, social influences, and perceived control shape pro-environmental behavior, making them highly relevant to global sustainability efforts and green marketing strategies.

This paper is organized as follows: Section 2 examines the relevant literature, focusing on sustainability-oriented consumer behavior. Section 3 presents the study's hypotheses and conceptual model. Section 4 delineates the methodology utilized. Section 5 outlines the results, while Section 6 discusses how the findings contribute to the broader goal of achieving sustainable consumption as outlined in SDG12, its implications for policymakers and businesses, and directions for future research.

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Foundation Theories

Understanding consumer decision-making in green purchasing requires a robust theoretical foundation. This study is anchored in two widely recognized psychological and behavioral frameworks: the Theory of Planned Behavior (TPB) and the Value-Belief-Norm (VBN) Theory. These theories provide valuable insights into how individual beliefs, social influences, and perceived control shape pro-environmental behavior, making them highly relevant to global sustainability efforts and green marketing strategies.

Theory of Planned Behavior (TPB): The TPB developed by Ajzen (1991) is one of the most widely applied models in consumer behavior research, particularly in sustainability-related studies. TPB posits that behavioral intention is influenced by three key factors: *(1) Attitude toward the behavior* – the extent to which an individual has a favorable or unfavorable evaluation of performing the behavior; *(2) Subjective norms* – the perceived social pressure to engage or not engage in the behavior; *(3) Perceived behavioral control* – the individual's perceived ease or difficulty in performing the behavior, which also accounts for non-volitional factors such as availability of eco-friendly products or financial constraints.

In the context of green purchasing, TPB suggests that individuals with stronger pro-environmental attitudes, greater perceived social approval, and a higher sense of control over their purchasing choices are more likely to engage in green consumption (Heo & Muralidharan, 2019; Nguyen et al., 2019; Bakr et al., 2023). The TPB has been extensively validated across various cultural and economic contexts (e.g., Onel, 2017; Cheung & To, 2019; Matharu et al., 2022; Sh. Ahmad et al., 2022), making it a suitable foundation for investigating green consumer behavior in emerging markets like Vietnam. However, TPB does not fully capture the psychological complexity of green purchasing, particularly factors like personal values, ethical concerns, and environmental skepticism. To address this gap, this study incorporates the Value-Belief-Norm (VBN) Theory (Stern et al., 1999), which delves deeper into moral obligations and normative influences in sustainability decision-making.

Value-Belief-Norm (VBN) Theory: The Value-Belief-Norm (VBN) Theory (Stern et al., 1999) explains pro-environmental behavior by emphasizing the role of personal values, ecological worldviews, and moral norms. Unlike TPB, which focuses on rational decision-making processes (Ajzen, 1991), VBN suggests that sustainability-related behaviors stem from deeply held values and ethical concerns (Stern et al., 1999). The theory follows a sequential cognitive process: *Personal values* (e.g., biosphere values, altruism, or selfishness) shape *Environmental Beliefs* (e.g., individuals' perceptions of environmental sustainability), which in turn influence *Consequence Perceptions* (e.g., individuals' recognition of their impact actions on the environment) and *Attributions of Responsibility* (individuals' responsibility for environmental problems), which ultimately shape *Personal Norms* (the development of a moral obligation to act environmentally) (Stern et al., 1999).

From a global marketing perspective, VBN theory helps explain why green purchasing behavior varies across cultures (Poortvliet et al., 2018). For example, collectivist societies (e.g., Taiwan, Japan, China) tend to place a stronger emphasis on social norms and shared responsibility (Chen, 2015; Hiratsuka et al., 2018; Hong et al., 2024), while individualist cultures (e.g., the US, UK) may rely more on personal values and self-interest in sustainability decisions (Han, 2015).

By integrating TPB and VBN, this study provides a comprehensive theoretical framework to explore how environmental beliefs, perceived consumer effectiveness, and skepticism influence green purchasing behavior in emerging markets. These insights are valuable not only for businesses operating in Vietnam but also for global marketers designing sustainability-focused campaigns in diverse cultural contexts.

2.2. Literature Review on Green Purchase Intention in the SDG12 Era

Green Purchase Intention (GrePurInt) has been extensively studied in consumer behavior research, particularly within the framework of environmental sustainability. GrePurInt refers to an individual's intention to buy eco-friendly products that minimize negative environmental impacts (Moser, 2015; Kovacs & Keresztes, 2022). Previous studies have demonstrated that consumers with strong environmental beliefs (EnvBeliefs) and high perceived consumer effectiveness (PerConEff) are likelier to engage in green purchasing behaviors (Hanss & Doran, 2020; Jaini et al., 2020; Ogiemwonyi & Jan, 2023). These constructs form the foundation for understanding consumer engagement in sustainable consumption, which aligns closely with Sustainable Development Goal 12 (SDG12): Responsible Consumption and Production (Nations, 2023).

SDG12 emphasizes the importance of reducing waste, improving resource efficiency, and promoting sustainable business practices. It encourages consumers to make environmentally responsible choices while urging companies to adopt sustainable production methods (Castellano et al., 2024; van Driel et al., 2024). Research suggests that consumer awareness of SDG12 plays a crucial role in shaping their purchase decisions, as individuals who recognize the broader implications of their consumption behavior are more inclined to choose green products (Nguyen et al., 2019; Ogiemwonyi & Jan, 2023). However, despite growing interest in sustainable consumption, many studies have yet to explicitly link GrePurInt with SDG12, particularly in emerging markets like Vietnam.

The integration of sustainability-oriented policies, corporate responsibility initiatives, and consumer education programs has been shown to positively influence GrePurInt by reinforcing the principles of SDG12 (Genc, 2021; Castellano et al., 2024). For instance, countries that have implemented eco-labeling schemes and green marketing campaigns have witnessed a rise in sustainable consumer behaviors (Cheung & To, 2019). Furthermore, research highlights that perceived greenwashing—where companies falsely claim to be environmentally responsible—can reduce consumer trust and weaken GrePurInt (Do Paço & Reis, 2016; Orazi & Chan, 2020). This suggests that achieving SDG12 requires both consumer engagement and corporate transparency, reinforcing the need for accurate environmental messaging.

In the context of Vietnam, sustainable consumption is still evolving, with economic, cultural, and regulatory factors shaping consumer attitudes toward green purchasing (Nguyen et al., 2019). While some studies have explored environmental concerns and purchase behavior in Vietnam (eg., Duong et al., 2023; Pham et al., 2024), few have explicitly examined how SDG12-driven policies and awareness impact GrePurInt. This study aims to fill this gap by analyzing how EnvBeliefs, PerConEff, and external moderating factors such as environmental skepticism (EnvSkept) and personal motivation (PersMoti) influence GrePurInt, while linking these relationships to the broader objectives of SDG12.
By embedding SDG12 into consumer behavior research, this study extends previous work on GrePurInt and sustainability by providing a more holistic understanding of how individual consumption choices contribute to global sustainability efforts. The next section presents the hypotheses and conceptual model, outlining how key variables interact in the context of green purchasing behavior and SDG12.

HYPOTHESES DEVELOPMENT

3.1. Consumer Beliefs, Attitudes, and Perceptions about the Environment

Consumer beliefs and attitudes toward the environment play a crucial role in shaping green purchasing behavior. Over the past decades, extensive research has examined how individuals' environmental worldviews influence their decision-making processes, particularly in the context of sustainable consumption (Dunlap et al., 2000). As global sustainability efforts intensify, understanding the psychological mechanisms underlying pro-environmental behavior has become increasingly relevant for marketers, policymakers, and businesses.

Research has consistently shown that persons with robust environmental beliefs are more inclined to engage in pro-environmental behaviours, such as purchasing eco-friendly products (Stern et al., 1999; Ertz et al., 2016; Bairrada et al., 2024). Beliefs impact AttGrePro and align with sustainability goals, as customers with increased environmental awareness generally prefer eco-friendly products (Hartmann & Apaolaza-Ibáñez, 2012; Li et al., 2021).

Moreover, EnvBeliefs has been associated with PerConEff, denoting an individual's conviction in their ability to address environmental issues (Stern et al., 1999; Ertz et al., 2016; Bairrada et al., 2024). Research demonstrates that customers with strong environmental beliefs are more likely to view their purchasing decisions as advantageous to the environment (eg.,Moser, 2015; Kovacs & Keresztes, 2022). This study articulates the subsequent hypotheses derived from the insights obtained.

H1a: EnvBeliefs positively impact consumers' AttGrePro
H1b: EnvBeliefs positively impact PerConEff

3.2. Consumer Attitudes, Perceptions, and Green Purchase Intentions

GrePurInt signifies a consumer's willingness to acquire environmentally friendly items, including those that mitigate pollution (Mittal et al., 2020) or conserve resources (Chen & Chang, 2013; Marzouk & Mahrous, 2020). This concept is essential for comprehending how environmental views convert into action. Green products generally possess characteristics such as recyclability, sustainable materials, and diminished carbon footprints (Isaacs, 2015; Mustafa et al., 2022; Bhatia et al., 2023; Elfaleh et al., 2023).

Attitudes Toward Green Products (AttGrePro): AttGrePro play a significant role in determining purchasing behavior (Ajzen, 1991). Consumers who perceive eco-friendly products as beneficial, high-quality, and aligned with their values are more likely to express higher GrePurInt (Hartmann & Apaolaza-Ibáñez, 2012; Nath et al., 2013; Sun et al., 2022). Nevertheless, a positive attitude toward green products does not always translate into actual purchasing behavior, a phenomenon known as the attitude-behavior gap (Vermeir & Verbeke, 2006). Various external factors, such as price sensitivity, product availability, and skepticism toward green claims, may weaken this relationship (Nguyen et al., 2019). However, studies have consistently shown that a favorable attitude is still one of the strongest predictors of GrePurInt in diverse market settings (Ramayah et al., 2010; Bong Ko & Jin, 2017).

Perceived Consumer Effectiveness (PerConEff): PerConEff refers to an individual's belief that their personal actions can contribute to environmental protection (Ellen et al., 1991; Hanss & Doran, 2020). Consumers who strongly believe that their purchasing choices can create a positive environmental impact are more likely to engage in sustainable consumption behaviors

(Jaini et al., 2020; Pham et al., 2024). This effect is particularly strong in markets with weaker regulatory enforcement, where consumers rely more on personal conviction rather than government policies (Nguyen et al., 2019). Moreover, prior research suggests that PerConEff enhances consumer engagement with green products and reinforces purchasing behavior (Vermeir & Verbeke, 2006). When consumers feel that buying green products leads to tangible environmental benefits, they are more likely to exhibit higher green purchase intention (Lee et al., 2014; Coelho et al., 2017). This study presents the following hypotheses based on the insights gathered:

H2: AttGrePro positively impacts consumers' GrePurInt
H3: PerConEff positively impacts consumers' GrePurInt

3.3. Attitudes Toward Green Products and Perceived Consumer Effectiveness

PerConEff shapes consumers' attitudes toward green products (Arias & Trujillo, 2020). PerConEff reflects the conviction that individual behaviors can significantly aid in environmental conservation (Hanss & Doran, 2020; Kumar et al., 2022). Customers are more likely to adopt favorable opinions about eco-friendly items when they believe their decisions, like buying them, can impact them (Kim & Choi, 2005; Jaini et al., 2020). This sense of empowerment fosters a stronger connection between environmental concerns and consumer behavior, leading to more favorable evaluations of green products (Vermeir & Verbeke, 2006; Moser, 2015).

Numerous studies indicate a correlation between elevated PerConEff levels and favorable attitudes towards environmentally friendly products (e.g., Kim & Choi, 2005; Ghvanidze et al., 2016; Jaini et al., 2020). Similarly, Consumers who believe they can impact environmental issues are more likely to regard eco-friendly products as significant and deserving of acquisition (Yeon Kim & Chung, 2011; Cao Minh & Nguyen Thi Quynh, 2024). This indicates that PerConEff influences purchase intention and shapes the overall perception of the product's benefits and appeal (Lavuri, 2022; Yu et al., 2024). The subsequent hypothesis is proposed based on these findings:

H4: Perceived consumer effectiveness positively impacts consumers' attitudes toward green products

3.3. Environmental Skepticism (EnvSkept) and Personal Motivation (PersMoti)

EnvSkept refers to the degree to which consumers doubt the credibility of environmental claims and corporate sustainability efforts (Musgrove et al., 2018). High levels of skepticism often lead to distrust in green advertising, reduced willingness to pay premiums for eco-friendly products (Do Paço & Reis, 2016; Nguyen et al., 2019), and lower engagement in sustainable purchasing behaviors (KASSIE & Hyongjae, 2023).

However, recent studies indicate that moderate skepticism can actually strengthen green purchase intention (Zarei & Maleki, 2018; Chen, 2020). Consumers who question environmental claims tend to conduct more thorough evaluations of products before making purchasing decisions, leading to higher-quality green purchases rather than blind acceptance or rejection weakening the influence of favorable attitudes on green consumption (Goh & Balaji, 2016). Therefore, skepticism may not always act as a barrier but can sometimes encourage more informed and responsible green consumption (Uddin et al., 2023). Thus, we hypothesize that:

H5: EnvSkept moderates the relationship between AttGrePro and GrePurInt, such that the relationship is stronger when skepticism is low and weaker when skepticism is high.

PersMoti is a key driver of sustainable behavior, reflecting the intrinsic desire to engage in eco-friendly actions (Tulusan et al., 2012). Individuals who are self-motivated to support environmental causes are more likely to translate their beliefs into actual purchasing behaviors (Tawde et al., 2023; Ng et al., 2024; Yadav et al., 2024).

However, motivation may interact with PerConEff in complex ways. In markets where green product accessibility is low or skepticism is high, motivation alone may be insufficient to drive actual purchase behavior. Instead, a strong belief in the effectiveness of one's actions (PerConEff) must be present for motivation to translate into meaningful purchasing decisions (Arias & Trujillo, 2020). Based on these insights, we hypothesize that:

H6: PersMoti moderates the relationship between PerConEff and GrePurInt, such that the relationship is stronger when motivation is high and weaker when motivation is low.

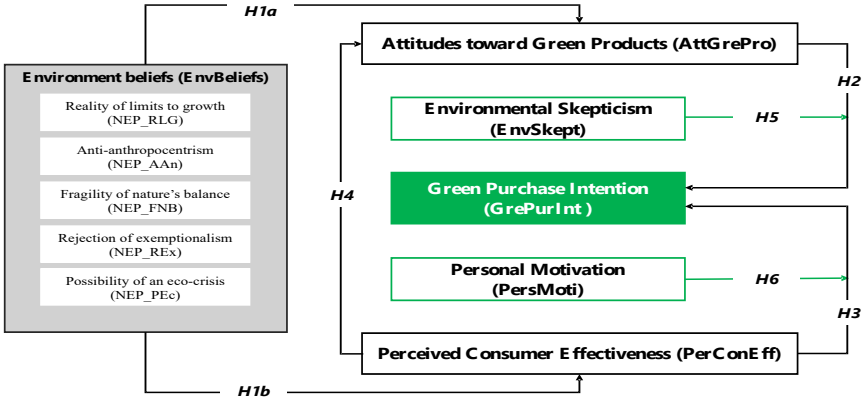

Fig 1. Conceptual model

METHODOLOGY

4.1. Measurement Scales

This study employs established measurement scales to assess key constructs related to GrePurInt. Each construct is measured using Likert-type scales adapted from previous literature, ensuring reliability and validity in the research context.

To measure EnvBeliefs, we adopt the New Ecological Paradigm (NEP) Scale, originally developed by Dunlap et al. (2000). The NEP scale consists of five dimensions assessing consumers' environmental worldview, including: *(1) Reality of limits to growth (NEP_RLG)* (e.g., "Natural resources are limited, and we need to protect them"); *(2) Anti-anthropocentrism (NEP_AAn)* (e.g., "Humans are severely abusing the environment."); *(3) Fragility of nature's balance (NEP_FNB)* (e.g., "Natural ecosystems are easily affected by human activities."); *(4) Rejection of exemptionalism (NEP_REx)* (e.g., "We must live in harmony with nature, not separate from it."); (5) *Possibility of an eco-crisis (NEP_PEc)* (e.g., "We need to act now to prevent a global ecological crisis."). PerConEff was measured using four items developed based on (Dang et al., 2020; Jaini et al., 2020), assessing consumers' belief that their purchasing choices can contribute to environmental protection. AttGrePro adapted five items from previous studies (Kim & Choi, 2005; Jaini et al., 2020; Shehawy & Ali Khan, 2024), measuring consumer perceptions of eco-friendly product benefits. EnvSkept was measured using four items developed based on (Goh & Balaji, 2016; Nguyen et al., 2019), capturing consumer doubts about the credibility of green claims and sustainability marketing. PersMoti adapted four items developed based on (Meng et al., 2024; Ng et al., 2024; Yadav et al., 2024), assessing the role of intrinsic motivation in sustainability-driven behavior. GrePurInt was measured using three items, adapted from Wang et al. (2024), evaluating the likelihood of consumers purchasing eco-friendly products.

By integrating these well-established measurement scales, this study ensures conceptual rigor and empirical validity in analyzing the factors shaping green purchase intention in an emerging market context.

4.2. Data Collection

This study collected data using a structured questionnaire. It targeted Hanoi residents who had never bought eco-friendly products. From April to September 2024, significant city retail centres hosted the poll.

Demographics and 35 questions to measure the six study model variables comprise the questionnaire. Everything was graded on a 7-point Likert scale from 1 ("strongly disagree") to 7 ("strongly agree"). The questionnaire was translated from English to Vietnamese and evaluated by 10 National Economics University PhD students to ensure quality and readability. Revisions from this argument led to a 50-person pilot study. The pilot improved the questionnaire and checked item suitability. The final sample contained 592 direct-interviewed respondents. The sample varied in Gender, Age_group, Education_level, Occupation, and Income, as indicated in Table I. Most participants were 35-44 (21.45%) and 55+ (23.82%), with the highest income group earning over $700 per month (34.12%). Most participants had college or associate degrees (27.20%) or high school diplomas (26.52%).

On top of quantitative survey data, qualitative data and supplemental material from the World Bank (2021) and Vietnam's General Statistics Office were collected to strengthen analysis and contextualise results.

TABLE I RESPONDENT PROFILES (N=592)

	Frequency	Percent		Frequency	Percent
Gender			**Age_Group**		
Male	303	51,18	18-24	104	17,57
Female	289	48,82	25-34	102	17,23
Education_level			35-44	127	21,45
High School	157	26,52	45-54	118	19,93
College or Associate Degree	161	27,20	55 and Above	141	23,82

Undergraduate Degree	138	23,31	**Occupation**		
Postgraduate Degree	136	22,97	Student	121	20,44
Income			Staff	135	22,80
$350	192	32,43	Manager	132	22,30
$351-$700	198	33,45	Housewife	91	15,37
Over $700	202	34,12	Retired	113	19,09

4.3. Research Methods

The data analysis method used in this study is Partial Least Squares Structural Equation Modeling (PLS-SEM). According to Hair & Alamer (2022), PLS-SEM can test and provide coefficients on the path relationships of direct and indirect relationships as well as evaluate the moderating role of variables in the model. Therefore, we used Smart PLS 4.0 software to evaluate both direct and indirect effects, moderating relationships between variables: EnvBeliefs, AttGrePro, PerConEff, EnvSkept, PersMoti and GrePurInt. Specifically, the two main evaluation steps include: (1) assessing the reliability and validity of the measurement model, including assessments of internal consistency, convergent validity, and discriminant validity, and (2) analyzing the structural model by examining the path coefficients, R^2 values, and significance of the proposed relationships through a 5000-sample bootraping (Hair & Alamer, 2022)

RESULTS

5.1. Evaluating the Measurement Model

The results of the measurement model evaluation by PLS-SEM are based on the criteria for reliability and validity of the constructs including Outer loading coefficient; Cronbach's alpha; Composite reliability (CR(rho_c)) and Average Variance Extracted (AVE) (see Table II). Most of the outer loading coefficients of the variables exceeded the acceptable threshold of 0.7, except for AttGrePro4 (0.673). According to Hair Jr et al. (2021), we removed this variable to ensure reliability in fully measuring their respective constructs. Continuing to check the Cronbach's alpha coefficient, the value ranged from 0.835 to 0.965; for Composite reliability, the value ranged from 0.889 to 0.968. Thus, both passed the recommended threshold of 0.7 for all constructs (Hair Jr et al., 2021). To assess convergent validity, we examined AVE, values ranged from 0.666 to 0.838, with the maximum AVE recorded for the construct EnvSkept being 0.838. All constructs demonstrated AVE values higher than the minimum criterion of 0.5 (Hair Jr et al., 2021), ensuring that they explained a significant portion of the variance in their respective indices.

TABLE II MEASUREMENT MODEL EVALUATION INDICATORS

Constructs	Code	Items	Outer loading	α	CR	AVE	Source
Environment beliefs: NEP_RLG NEP_AAn NEP_FNB NEP_REx NEP_PEc	NEP_RLG1	We are approaching the limit of the number of people the Earth can support.	0.844	0.965	0.968	0.672	Developed base on (Dunlap & Van Liere, 1978; Dunlap et al., 2000)
	NEP_RLG2	Natural resources are limited and we need to protect them.	0.825				
	NEP_RLG3	There is a limit to the economic and population growth that the Earth can endure.	0.828				
	NEP_AAn1	Humans are severely abusing the environment.	0.808				
	NEP_AAn2	Environmental health is more important than short-term economic benefits.	0.772				
	NEP_AAn3	All living beings have value and humans are not the center of the universe.	0.802				
	NEP_FNB1	The balance of nature is very delicate and easily upset.	0.816				
	NEP_FNB2	Natural ecosystems are easily affected by human activities.	0.841				
	NEP_FNB3	The natural environment needs to be protected because it is very vulnerable.	0.822				
	NEP_REx1	Humans cannot fully control nature no matter how much we learn from it.	0.810				
	NEP_REx2	Humans are not special enough to ignore natural laws.	0.823				
	NEP_REx3	We must live in harmony with nature, not separate from it.	0.823				

	NEP_PEc1	If things continue on their present course, we will soon experience a major ecological crisis.	0.825				
	NEP_PEc2	Pollution and climate change are becoming serious threats to life on Earth.	0.816				
	NEP_PEc3	We need to act now to prevent a global ecological crisis.	0.835				
Attitudes Toward Green Products (AttGrePro)	AttGrePro1	I believe that green products are good for the environment.	0.859	0.879	0.917	0.734	Developed base on (Jaini (Jaini et al., 2020; Shehawy & Ali Khan, 2024)
	AttGrePro2	Using green products helps to reduce negative impacts on the environment.	0.868				
	AttGrePro3	I prefer using green products over conventional products.	0.839				
	AttGrePro4*	I feel that buying green products is a responsible consumer decision.	0.673				
	AttGrePro5	Green products can help me live a more sustainable life.	0.860				
Perceived Consumer Effectiveness (PerConEff)	PerConEff1	My small actions in using green products can make a difference to the environment.	0.853	0.838	0.891	0.671	Adopted from (Dang et al., 2020; Jaini et al., 2020)
	PerConEff2	I believe that my personal responsible consumption can contribute to reducing environmental problems.	0.839				
	PerConEff3	Every consumer has a responsibility to contribute to environmental protection through his or her consumption behavior.	0.744				
	PerConEff4	My decision to buy green products will have a positive impact on the environment.	0.837				
Green Purchase Intention (GrePurInt)	GrePurInt1	I intend to buy products that are environmentally friendly.	0.896	0.871	0.921	0.795	Adapted from (Wang et al., 2024)
	GrePurInt2	I prefer to purchase products with eco-friendly packaging.	0.886				
	GrePurInt3	I am willing to pay more for green products.	0.893				
Environmental Skepticism (EnvSkept)	EnvSkept1	I am skeptical of companies' claims that their products are "green."	0.921	0.935	0.954	0.838	Developed base on (Goh & Balaji, 2016; Nguyen et al., 2019)
	EnvSkept2	I believe that many companies use green advertising to mislead consumers.	0.917				
	EnvSkept3	Many products are marketed as environmentally friendly when they are not.	0.909				
	EnvSkept4	I do not trust that "green" products are actually as good for the environment as companies claim.	0.916				
Personal Motivation (PersMoti)	PersMoti1	I buy green products because I want to make a good impression on my friends and family.	0.792	0.835	0.889	0.666	Developed base on (Meng et al., 2024; Ng et al., 2024; Yadav et al., 2024)
	PersMoti2	I feel motivated to buy green products to contribute to environmental protection.	0.823				
	PersMoti3	I believe that buying green products will help me live a more socially responsible life.	0.824				
	PersMoti4	Buying green products makes me feel that I am doing something useful for the community.	0.825				

Note: * Variables are omitted based on outer loading thresholds below 0.7. α: Cronbach's alpha CR: Composite reliability. AVE: Average Variance Extracted.

The assessment of discriminant validity was performed using the Fornell-Larcker criterion (Fornell & Bookstein, 1982) and the Heterotrait-Monotrait (HTMT) ratio. Table III demonstrates that all square roots of the Average Variance Extracted (AVE)

surpass the respective inter-construct correlations, hence affirming discriminant validity. Moreover, all HTMT values are below the stringent threshold of 0.85 (Sarstedt et al., 2021), further validating the distinctiveness of each construct. The measurement model exhibits robust reliability and validity, establishing a firm basis for the analysis of the structural model.

TABLE III THE MEASUREMENTS' DISCRIMINANT VALIDITY

Fornell-Larcker	**AttGrePro**	**EnvBeliefs**	**EnvSkept**	**GrePurInt**	**PerConEff**	**PersMoti**
AttGrePro	0.857					
EnvBeliefs	0.154	0.820				
EnvSkept	0.259	0.091	0.916			
GrePurInt	0.372	0.013	0.332	0.892		
PerConEff	0.197	0.161	0.111	0.279	0.819	
PersMoti	0.181	-0.055	0.302	0.112	-0.004	0.816
HTMT	**AttGrePro**	**EnvBeliefs**	**EnvSkept**	**GrePurInt**	**PerConEff**	**PersMoti**
AttGrePro						
EnvBeliefs	0.161					
EnvSkept	0.286	0.094				
GrePurInt	0.424	0.034	0.366			
PerConEff	0.222	0.170	0.119	0.322		
PersMoti	0.211	0.063	0.339	0.126	0.054	

5.2. Evaluating the Structure Model

We evaluated the hypothesised associations in the structural model using path coefficients, R^2 values, and effect sizes (f^2), as shown in the tables below. The structural model analysis results were bootstrapped with 5,000 resamples, and Fig 2 shows all significant routes. Table VI path coefficients support most hypothesised correlations. EnvBeliefs positively influences AttGrePro ($\beta = 0.154$, $p < 0.001$), supporting H1a, and positively impacts PerConEff ($\beta = 0.161$, $p < 0.001$), supporting H1b. GrePurInt was positively influenced by AttGrePro ($\beta = 0.277$, $p < 0.001$), supporting H2, and positively influenced by PerConEff ($\beta = 0.247$, $p < 0.001$), supporting H3. PerConEff positively impacted AttGrePro ($\beta = 0.177$, $p < 0.001$), supporting H4. EnvSkept significantly moderated the link between AttGrePro and GrePurInt ($\beta = 0.095$, $p < 0.01$), supporting H5. PersMoti did not significantly moderate the connection between PerConEff and GrePurInt ($\beta = -0.063$, $p = 0.106$), disproving H6.

TABLE IV PATH ANALYSIS EMPLOYING MAXIMUM LIKELIHOOD ESTIMATIONS.

Path	**Path coefficient**	**T statistics**	**P values**	**Results**
EnvBeliefs -> AttGrePro	0.154	3.607	***	H1a: Supported
EnvBeliefs -> PerConEff	0.161	3.750	***	H1b: Supported
AttGrePro -> GrePurInt	0.277	6.491	***	H2: Supported
PerConEff -> GrePurInt	0.247	6.349	***	H3: Supported
PerConEff -> AttGrePro	0.177	4.118	***	H4: Supported
EnvSkept x AttGrePro -> GrePurInt	0.095	2.826	**	H5: Supported
PersMoti x PerConEff -> GrePurInt	-0.063	1.616	0.106	H6: Not Supported

Note: **p<.01, ***p<.001

The R^2 values presented in Table V reveal that the model explains 24.9% of the variance in GrePurInt ($R^2 = 0.249$), indicating a modest level of explanatory power. The model explains 5.4% of the variance in AttGrePro ($R^2 = 0.054$) and 2.6% in PerConEff ($R^2 = 0.026$).

TABLE V R^2 VALUES

Variables	**R^2**	**R^2 adjusted**
Attitudes toward Green Products (AttGrePro)	0.054	0.051
Perceived Consumer Effectiveness (PerConEff)	0.026	0.024
Green purchase intention (GrePurInt)	0.249	0.241

Effect sizes (f^2) presented in Table VI demonstrate that the relationship between AttGrePro and GrePurInt exhibits a medium effect ($f^2 = 0.090$). In contrast, the relationships between EnvBeliefs and AttGrePro ($f^2 = 0.016$) and PerConEff and GrePurInt ($f^2 = 0.049$) show small yet significant effects. Other effect sizes, including the interaction terms, demonstrated minimal effects, with EnvSkept x AttGrePro exhibiting a f^2 value of 0.014.

TABLE VI F^2 VALUES

Hypothesis	**Path**	**f-square**

H1a	EnvBeliefs -> AttGrePro	0.016
H1b	EnvBeliefs -> PerConEff	0.027
H2	AttGrePro -> GrePurInt	0.090
H3	PerConEff -> GrePurInt	0.049
H4	PerConEff -> AttGrePro	0.032
H5	EnvSkept x AttGrePro -> GrePurInt	0.014
H6	PersMoti x PerConEff -> GrePurInt	0.005

The assessment of model fit was conducted using various indicators, as shown in Table VII. The estimated model exhibited a Standardised Root Mean Square Residual (SRMR) value of 0.056, which is below the recommended threshold of 0.08, suggesting a satisfactory model fit (Henseler et al., 2015). Additional fit indices, such as Chi-square and Normed Fit Index (NFI), corroborated that the model adequately fits the data.

TABLE VII MODEL FIT

Indicators	Saturated model	Estimated model
SRMR	0.034	0.056
d_ULS	0.693	1.939
d_G	0.328	0.332
Chi-square	1.153.926	1.145.390
NFI	0.919	0.919

The structural model results robustly endorse the majority of the proposed linkages, especially the direct influences of EnvBeliefs and PerConEff on attitudes and GrePurInt, while emphasising the moderating role of EnvSkept.

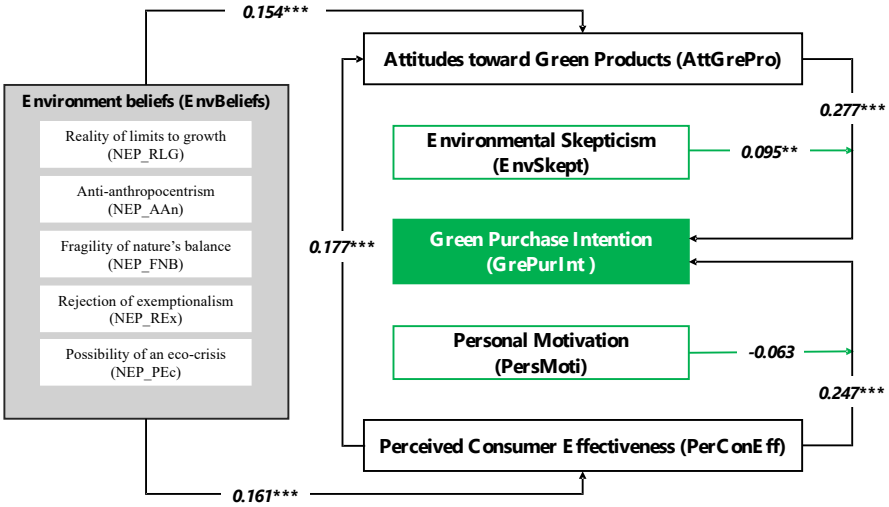

Fig 2. The results of hypothesis testing

DISCUSSION

6.1. Conclusion

This study offers significant insights into the relationships between EnvBeliefs, AttGrePro, PerConEff, and GrePurInt while examining the moderating effects of EnvSkept and PersMoti. By integrating SDG12 – Responsible Consumption and Production, this research extends the existing literature on green consumer behavior in an emerging market context.

First, our findings confirm that EnvBeliefs positively influences both AttGrePro and PerConEff, supporting the idea that individuals with stronger pro-environmental beliefs are more likely to develop favorable AttGrePro and perceive their actions as impactful. This aligns with prior research in developed markets (e.g., Jaini et al., 2020), but our study uniquely demonstrates that these relationships hold in a developing economy like Vietnam, where sustainability awareness is still evolving.

Second, we reaffirm that positive AttGrePro and PerConEff significantly drive GrePurInt, reinforcing the TPB and the VBN. However, our study moves beyond traditional consumer behavior models by explicitly linking these psychological factors to SDG12's objectives, highlighting how fostering individual empowerment and environmental awareness can encourage responsible consumption behaviors.

Third, a notable contribution of this study is the moderating role of EnvSkept. Unlike some prior studies suggesting that skepticism weakens GrePurInt (e.g.,Zarei & Maleki, 2018), our results show that in certain contexts, higher skepticism strengthens the relationship between AttGrePro and GrePurInt. This suggests that when consumers have a positive AttGrePro, skepticism may push them to be more selective and intentional in their purchases, leading to more informed and responsible consumption—an important aspect of SDG12.

Fourth, contrary to expectations, PersMoti did not significantly moderate the relationship between PerConEff and GrePurInt. While previous research (e.g., Tulusan et al., 2012; Yadav et al., 2024) emphasized the role of intrinsic motivation in sustainable consumption, our findings suggest that in Vietnam's emerging market, external factors such as policy incentives, corporate transparency, and eco-labeling may play a larger role in shaping GrePurInt. This highlights the need for targeted strategies that complement intrinsic motivation with structural support, aligning with SDG12's call for systemic interventions to encourage responsible consumption.

Finally, this study makes a theoretical and practical contribution by explicitly embedding SDG12 within consumer behavior research. It provides evidence that achieving responsible consumption goals requires a multifaceted approach that addresses individual attitudes, perceived impact, and external moderating factors such as skepticism and motivation. These insights offer valuable implications for businesses, policymakers, and researchers, guiding future initiatives to promote sustainable consumer behavior in developing markets.

6.2. Implication

The findings of this study offer several valuable implications for practitioners, policymakers, and researchers aiming to promote green consumer behavior.

Implications for Practitioners: For businesses, retailers, and marketers, this study underscores the importance of fostering positive AttGrePro and strengthening PerConEff to drive GrePurInt. Since EnvBeliefs and attitudes play a crucial role in sustainable consumption, businesses must design marketing strategies that reinforce these positive perceptions while reducing EnvSkept. To align with SDG12: Responsible Consumption and Production, practitioners should adopt the following strategies:

First, strengthening credibility through transparency and third-party certifications. Our findings indicate that skepticism about environmental claims affects consumer decision-making. Businesses should focus on clear, verifiable eco-labeling, provide third-party endorsements, and ensure consistent environmental messaging to build trust and credibility.

Second, enhancing consumer engagement through education and storytelling. Educating consumers about the environmental impact of their purchases can strengthen their PerConEff. This can be achieved through impact-driven storytelling, interactive campaigns, and corporate sustainability reports that demonstrate measurable progress toward SDG12.

Third, developing targeted marketing for different consumer segments. Since PersMoti did not significantly moderate the relationship between PerConEff and GrePurInt in this study, businesses should adopt tailored marketing approaches. Younger consumers may respond better to social media-driven green campaigns, while older consumers might prefer detailed product information and sustainability reports.

Fourth, minimizing greenwashing to reduce skepticism. Companies that exaggerate their sustainability efforts risk increasing consumer skepticism, ultimately weakening GrePurInt. To avoid this, firms should ensure that all green claims are backed by scientific evidence, regulatory compliance, and independent audits.

By implementing these strategies, businesses can enhance consumer trust, improve market competitiveness, and contribute to SDG12's objective of sustainable consumption.

Implications for Policymakers: This study highlights the critical role of government support in shaping consumer attitudes and behaviors toward sustainable consumption. Since EnvSkept moderates green purchasing behavior, policymakers must take an active role in regulating, educating, and incentivizing responsible consumption practices to help achieve SDG12. To foster a sustainable consumption ecosystem, policymakers should consider the following initiatives:

First, developing stricter regulations on eco-labeling and corporate sustainability claims. Our findings show that skepticism influences green purchasing decisions. Governments should enforce clearer standards for environmental claims, penalize greenwashing, and require transparent reporting on corporate sustainability efforts.

Second, promoting nationwide awareness campaigns on SDG12. Many consumers remain unaware of how their purchasing choices impact sustainability goals. Public campaigns, sustainability-focused educational programs, and collaborations with businesses can help raise awareness about the importance of SDG12 and encourage long-term behavior change.

Third, offering tax incentives and subsidies to businesses that adopt sustainable practices. To encourage the transition to responsible production and consumption, policymakers should introduce tax reductions, subsidies, and financial incentives for companies investing in green technologies, circular economy models, and eco-friendly packaging solutions.

Fourth, strengthening sustainable supply chain policies. Given PerConEff's role in shaping GrePurInt, policymakers should develop stronger regulations on sustainable production, waste management, and carbon footprint disclosure to provide consumers with clear environmental impact information about products.

By integrating these policy interventions, governments can support responsible consumption, mitigate environmental skepticism, and ensure long-term progress toward SDG12.

6.3. Limitations and Future Research

Despite its contributions, this study has some limitations that suggest directions for future research. First, the study was conducted in Vietnam, which may limit generalizability to other cultural and economic contexts. Future research could compare findings across markets, especially between markets with strong SDG12 policies and emerging economies. Second, reliance on self-reported data may introduce bias. Future studies could employ longitudinal or experimental designs to track actual consumer behavior over time. Third, additional factors influencing green purchase intention (GrePurInt) were not explored. Future research could examine how government regulations, corporate sustainability initiatives, and perceived greenwashing shape consumer trust and decision-making. Fourth, this study focused on first-time green product buyers, limiting insights into habitual purchasing behavior. Future studies could compare occasional versus repeat consumers to understand long-term behavior shifts. Finally, this study focused on green purchasing but did not address other SDG12-related behaviors, such as recycling, waste reduction, or circular-economy adoption. Expanding the scope to examine broader sustainable consumption patterns would provide a more comprehensive view of consumer engagement with SDG12.

By addressing these limitations, future research can deepen the understanding of how individual psychology, business strategies, and policy interventions collectively drive sustainable consumption.

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