



Stimulation of Purchase Behavior Toward Biodegradable Bags: The Role of Green Skepticism

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Abstract

Today, the habit of using light, durable, and disposable plastics that are poorly managed is one of the main reasons for environmental pollution, biodiversity loss, and climate change in Vietnam. Besides, due to the lack of consumption, most plastic companies in Vietnam refuse to switch their production to biodegradable plastic bags. The study is conducted to promote the purchase behavior of biodegradable plastic bags, which can reduce the consumption of non-degradable plastic in Vietnam. A non-probability sampling method was applied, with a sample size of 828 consumers who lived in Southeast Vietnam. SmartPLS software was applied to examine the hypotheses. The results show that attitudes, coping appraisal, and threat positively influence the purchase behavior of biodegradable plastic bags. Green skepticism negatively moderates the relationship between attitudes, coping appraisal, threat appraisal, and purchase intention toward biodegradable plastic bags. This study also added psychological factors, such as green skepticism, to fill the perception-behavior gap from previous studies and extend the protection-motivation theory. Some managerial implications will be proposed for plastic companies in Vietnam to switch their production toward biodegradable plastic bags. Besides, consumers will also be given guidance and encouragement to use these products through integrated marketing communication strategies.

Keywords:

Coping Appraisal;
Threat Appraisal;
Attitudes; SmartPLS;
Green Skepticism;
Biodegradable Plastic Bag.

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1- Introduction

Nowadays, environmental pollution, biodiversity loss, and climate change are the main issues that many nations have tried to resolve. One of the main reasons is that consumers worldwide rely too much on the habit of using light, durable, and disposable plastics [1]. The report of the United Nations (2023) [1] stated that the total annual production of fossil fuel-based plastic is 430 million tons per year, about 2/3 of which has become plastic waste. The waste treatment methods of burning or burying could only reluctantly handle 130 million tons of this massive plastic waste [1]. The remaining 225 million tons of plastic waste were discharged directly into the natural environment, such as the sea or forests, especially in Southeast Asian countries such as Vietnam [2].

The government of Vietnam is also facing the same problems with plastic waste. In the year 2022, the report of Vietnam's Ministry of Industry and Trade [3] stated that 2.9 million tons of plastic waste were generated by Vietnamese consumers, but only 2.4 million tons were collected. The total loss of 0.42 million tons of plastic waste was discharged directly into the environment, and around 1.2 million tons of collected plastic waste were poorly managed [3, 4]. This huge amount of plastic waste was discharged into rivers, sea, or land by Vietnamese consumers, bringing Vietnam into the top ten countries emitting plastic waste into the ocean [4]. Besides, microplastics were also found in various water

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environments, such as rivers, lakes, bays, and beaches in Vietnam, revealing a link between plastic products and anthropogenic activities in the surrounding area [5]. In addition, Vietnamese consumers have still favored carrying plastic bags when buying products from traditional markets/supermarkets or even mini shops [6]. Therefore, only 30 manufacturers among 500 plastic bag manufacturers have switched their production to biodegradable plastic bags because they were afraid of low consumption [7]. The Vietnam Plastics Association's president also stated that low consumption of biodegradable plastic bags primarily comes from two main reasons: high cost and poor perceptions of plastic pollution among sellers and consumers [8]. Therefore, to promote the green purchase behavior of Vietnamese consumers towards biodegradable plastic bags, the manufacturers and traders of biodegradable plastic bags must consider how to increase their customers' perceptions.

Green purchase behavior has been researched by many authors in the field of marketing by applying the theory of planned behavior [9] and the theory of reasoned action [10]. These theories only mention about psychological factors as attitudes, subjective norms, and perceived behavioral control to explain consumer behavior. However, other psychological factors, such as morality, skepticism, and perception, shall also be explored for their impact on consumer behavior [11]. One of the theories that has applied perception to explain behavior is the protection-motivation theory (PMT). The protection motivation theory was studied in the medical field a long time ago based on the mechanism of responding to fear by triggering the cognitive mediating process of the human mind [12]. Manufacturers of beauty and personal care products, as well as drugs and medical products, have applied the managerial implications from studies of protection motivation theory and succeeded in motivating their consumers' purchase intentions by using fear appeal [13]. In Vietnam, there were also successful advertisements from medicine companies that showed the threats of being ill and guided the response of consumers to eliminate threats by buying dietary supplement products (calcium milk, glucosamine, and curcumin products).

In recent years, researchers have applied protection motivation theory to explore consumer behavior in many fields of study, such as functional foods [14, 15], green buying behavior [16], or sustainable consumption [17, 18]. The results prove that higher constructs of PMT, such as perceived severity, perceived vulnerability, self-efficacy, and response-efficacy, will lead to higher green purchase intention [16] or higher sustainable consumption [17, 18]. Some researchers also integrated the protection motivation theory and the theory of planned behavior to explore consumers' purchase intentions toward organic foods [19, 20]. However, only a few studies have mentioned the perception-behavior gap [21], the attitudes-behavior gap of customers [22, 23], or extending protection motivation theory with other psychological factors [17]. To clarify the perception-behavior gap or the attitudes-behavior gap, this study is conducted by integrating three theories of predicting behavioral intention: protection motivation theory (PMT), theory of planned behavior (TPB), and attitudes-behavior-context theory (ABCs). When integrating the three theories above, this study is the first study that apply psychological factors such as green skepticism to the protection motivation theory to solve the perception-behavior gap and extend the original protection motivation theory. In addition, this study also proves that the attitude-behavior gap may exist due to green skepticism as a contextual factor.

To conclude, this study was conducted to explore the purchase intention toward specific green products in Vietnam, such as biodegradable plastic bags. The results show that attitudes toward biodegradable plastic bags will mediate the relationship between the constructs of PMT and purchase intention. At the same time, green skepticism moderates the relationship between attitudes, PMT constructs, and purchase intention toward biodegradable plastic bags. Based on the results, some managerial implications will be proposed for plastic companies in Vietnam to switch their production toward biodegradable plastic bags. Besides, consumers will also be given guidance and encouragement to use these products through integrated marketing communication strategies.

2- Literature Review

2-1- Theories

2-1-1- Protection Motivation Theory

Protection motivation theory (PMT) was first proposed by Rogers in 1975. This behavioral theory explains how people are motivated to protect themselves from threats, depending on their cognitive appraisal of the threat and their perceived ability to cope with threats [12]. The cognitive mediating processes happen specifically: when there are threats, the human's mind will begin to evaluate threats through threat appraisal and coping appraisal. Then, these two main cognitive mediating processes will lead to the behavioral intention to cope with or avoid threats [24, 25]. PMT has been applied in many fields of research, such as the medical field [24–26], hotels and restaurants [27], pro-environmental behavior [28], or consumer behavior [16, 17, 19, 20, 29].

2-1-2- Theory of Planned Behavior

Ajzen (1991) [30] proposed the Theory of Planned Behavior (TPB) to analyze the behavioral intention and actual behavior of humans. According to TPB, perceived behavioral control is the human cognitive process of performing a behavior based on past experiences and assumptions of difficulties or expected outcomes [30]. People's intention to

perform a behavior and their actual behavior will be influenced by personal attitudes toward that behavior, subjective norms, and perceived behavioral control [31, 32]. The theory of planned behavior has been applied in many studies to explore consumer behavior in many fields of research [33–35].

2-1-3- Attitudes-Behavior-Context Theory

Guagnano et al. (1995) [36] first proposed the attitudes-behavior-context theory (ABCs). The theory states that behavior is a function of both attitudinal and contextual factors [36]. Based on ABCs theory, in the case of expensive or time-consuming products, consumer attitudes tend to have a weaker association with actual behavior [37, 38]. According to the study of Dhir et al. (2021) [35], attitudes cannot wholly control behavior, and contextual factors are required to increase the ability to predict actual behavior. Scholars such as Goh & Balaji (2016) [39] and Tandon et al. (2020) [40] also suggested that consumers exhibit a particular behavior to achieve benefits. Notably, the behavior can only be observed when consumers have favorable attitudes under the significant impact of contextual factors [39].

2-1-4- Biodegradable Plastic Bags

Biodegradable material is a new material from renewable resources, which is applied to produce biodegradable packaging products such as bags [41]. According to Moshood et al. (2022) [42], biodegradable packaging is defined as a product that is produced from biodegradable materials and is entirely biodegradable. These products will support the reduction of landfill use for plastic waste and increase the utilization of agricultural resources to produce green or bio-based materials [42]. Similar to the definitions from Jawaid et al. (2019) [41] and Moshood et al. (2022) [42], the Vietnam Packaging Association also defined a biological bag as a type of bag, which was made from green materials of natural origin and is easily decomposed, such as corn starch, potatoes, cassava, biodegradable plastic, or others [43].

2-2- Hypotheses Development

2-2-1- PMT Constructs and Purchase Intention Toward Biodegradable Plastic Bags

Based on the original model of protection motivation theory of Rogers (1975) [12], Abraham et al. (1994) [44] defined threat appraisal as a sum of perceived vulnerability and perceived severity when facing threats, then minus the maladaptive rewards that are created by the adaptive behavior. If the sum of perceived vulnerability and perceived severity is higher than maladaptive rewards, the individual will take the adaptive behavior [44]. Cismaru and Lavack (2006) [25] summarized threat appraisal as the evaluation of the components of action in coping with fear, related to an individual's feelings. Threat appraisal is compromised by perceived vulnerability and perceived severity, and threat appraisal can be measured as higher-order variables [44–46]. Ibrahim & Al-Ajlouni (2018) [16] also defined threat appraisal as a cognitive mediating process focusing on environmental threats. The higher the perceived vulnerability and severity of environmental threats such as extinction (threat appraisal) will lead to the higher the behavioral intention to act and eliminate that threat [16]. There are also previous studies that proved the relationship between threat appraisal and the purchase behavior of different kinds of green products [16, 19, 20, 29, 47, 48]. Therefore, the authors can conclude that a higher threat appraisal leads to a higher purchase intention toward biodegradable plastic bags. Based on previous studies, the authors propose the following research hypothesis:

H1. Threat appraisal positively and directly influence on the purchase intention toward biodegradable plastic bags.

Abraham et al. (1994) [44] defined coping appraisal as a sum of the perceived response-efficacy of the adaptive behavior and the perceived self-efficacy of the individual to engage in that behavior, minus the additional costs that were created by adaptive behavior. If the sum of response-efficacy and self-efficacy is higher than the response costs, the individual will take the adaptive behavior [44]. Cismaru & Lavack (2006) [25] also summarized that coping appraisal refers to the cognitive mediating process in response to fear, as reflected in self-efficacy and response-efficacy, as well as considering the costs of action. Then, people will be motivated to perform the recommended behaviors and expect that the adaptive behaviors will eliminate threats. Coping appraisal is compromised by self-efficacy and response-efficacy minus the response costs and could be measured as higher-order variables [44–46]. Ibrahim & Al-Ajlouni (2018) [16] also argued that higher self-efficacy and response-efficacy of environmental threats such as extinction (coping appraisal) will lead to a higher behavioral intention to act and eliminate that threat. However, the response costs can reduce the individual's coping appraisal and the behavioral intention to act [16]. Many previous studies have also proved the relationship between coping appraisal and the purchase behavior of different kinds of green products [16, 19, 20, 29, 47, 48]. Therefore, the authors can conclude that a higher coping appraisal will lead to a higher purchase intention toward biodegradable plastic bags. Based on previous studies, the authors propose the following research hypotheses:

H2. Coping appraisal positively and directly influence on the purchase intention toward biodegradable plastic bags.

H3. Response costs negatively and directly influence on coping appraisal.

2-2-2- The Relationship Between PMT Constructs

Based on the studies of Floyd et al. (2000) [24] and Cismaru & Lavack (2006) [25], the protection motivation model will include two main cognitive mediating processes that operate independently: threat appraisal and coping appraisal. These constructs together directly and positively influence behavioral intention to perform adaptive behaviors [25]. However, some scholars, such as Tanner et al. (1991) [49], Plotnikoff & Trinh (2010) [50], and Yasami (2021) [51], continued to explore the relationship between threat appraisal and coping appraisal in many different contexts by using empirical studies as well as theoretical research. According to Tanner et al. (1991) [49], in a marketing situation, threat information will first be assessed through the threat appraisal process, which is necessary before knowing the information about coping capability to begin coping appraisal. The studies of Plotnikoff & Trinh (2010) [50] and Yasami (2021) [51] also show that when an individual has higher threat appraisal, followed by coping appraisal, it will lead to higher behavioral intention than an individual who only performs coping appraisal. Therefore, the authors conclude that coping appraisal can mediate the relationship between threat appraisal and behavioral intention [49]. Based on previous studies, the authors propose the following research hypothesis:

H4. Threat appraisal positively and directly influences on coping appraisal.

H5. Coping appraisal mediates the relationship between threat appraisal and the purchase intention toward biodegradable plastic bags.

2-2-3- Attitudes and Purchase Intention Toward Biodegradable Plastic Bags

Many previous studies applied the theory of planned behavior to analyze the behavior of consumers. According to Oh & Yoon (2014) [52], attitudes substantially impact consumers' ethical consumption. The results are the same as the study of Cachero-Martínez (2020) [33], which shows that attitudes have the strongest impact on the purchase intention toward organic foods. Alternatively, attitudes also have the strongest impact on the purchase intention toward green foods [53]. Sadiq et al. (2023) [54] also argued that there were different attitudes, such as attitudes toward the environment and health. Both attitudes positively and strongly influence consumers' intentions to consume organic foods. The studies of Dhir et al. (2021) [35], Alam et al. [55] and Wang et al. [56] also show that consumers' attitudes towards green products can impact their intention to purchase them. Based on previous studies, the authors propose the following research hypothesis:

H6. Attitudes positively and directly influence on purchase intention toward biodegradable plastic bags.

2-2-4- PMT Constructs and Attitudes Towards Biodegradable Plastic Bags

The argument of Cismaru & Lavack (2006) [25] shows that the constructs of PMT can influence humans' attitudes and behavioral intentions. Based on the research of Cismaru & Lavack's (2006) [25], previous studies explored the relationship between attitudes, threat appraisal, and coping appraisal. The study of Tan & Lau (2011) [57] points out the gap in the mediating role of attitudes in the relationship between the factors of threat appraisal, coping appraisal, and green purchase intention. The studies of Pang et al. (2021) [19] and Tan et al. (2022) [20] show that attitudes towards organic foods partially mediate the relationship between the constructs of threat appraisal to consumers' intention to purchase organic products, or the constructs of coping appraisal to the purchase intention toward organic foods. In conclusion, coping appraisal and threat appraisal can directly or indirectly influence consumers' intentions to purchase green products [16, 19, 20].

Based on previous studies, the authors propose the following research hypothesis:

H7. Threat appraisal positively and directly influences on attitudes toward biodegradable plastic bags.

H8. Coping appraisal positively and directly influences on attitudes toward biodegradable plastic bags.

H9a. Attitudes mediate the relationship between coping appraisal and purchase intention toward biodegradable plastic bags.

H9b. Attitudes mediate the relationship between threat appraisal and purchase intention toward biodegradable plastic bags.

2-2-5- Moderating Role of Green Skepticism

Green skepticism in the field of marketing can mainly be understood as consumers' skepticism about whether a business's green products or services are genuinely green [58]. The messages that manufacturers send out to introduce about the product's quality, design, features, or value can raise consumers' skepticism. If consumers are skeptical about

the product, their purchase behavior toward that product can be decreased [59]. From there, green skepticism can decrease the purchase behavior of consumers.

Based on the attitudes-behavior-context theory, green skepticism can act as a contextual factor and have an impact on the direction of the relationship between people's attitudes and behavioral intentions [36]. The study by Junior et al. (2015) [60] shows that higher levels of consumer skepticism can contribute to the gap in attitudes-green purchase intentions. According to research by Zarei & Maleki (2018) [22] and Uddin et al. (2023) [23], the relationship between attitudes and green purchase intention is negatively moderated by green skepticism. When green skepticism is high, green purchase intention may not be high, even though attitudes towards green products are high [23].

According to the protection motivation theory, threat appraisal and coping appraisal are two cognitive mediating processes (perception) that change attitudes and lead to behavioral intention [25]. Deliana & Rum (2023) [21] argued that there was a gap between consumers' perceptions and behaviors based on the attitudes-behavior-context theory. In addition, the results by Byrd et al. (2022) [27] also show that trust-in-science and scientists can impact the relationship between consumers' perceptions and behavior. Therefore, the relationship between coping appraisal, threat appraisal, and purchase intention toward biodegradable bags can be impacted by other psychological factors such as green trust or skepticism, which is consistent with attitudes-behavior-context theory. The moderating effect happens when green skepticism is high, green purchase intention may not be high, and even coping and threat appraisals are high.

Based on previous studies, the authors propose the following research hypothesis:

H10a. Green skepticism negatively and significantly moderates the relationship between attitudes and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of attitudes on purchase intention.

H10b. Green skepticism negatively and significantly moderates the relationship between threat appraisal and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of threat appraisal on purchase intention.

H10c. Green skepticism negatively and significantly moderates the relationship between coping appraisal and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of coping appraisal on purchase intention.

H11. Green skepticism negatively and directly influences on the purchase intention toward biodegradable plastic bags.

Based on the above hypotheses, the authors propose the research model in Figure 1.

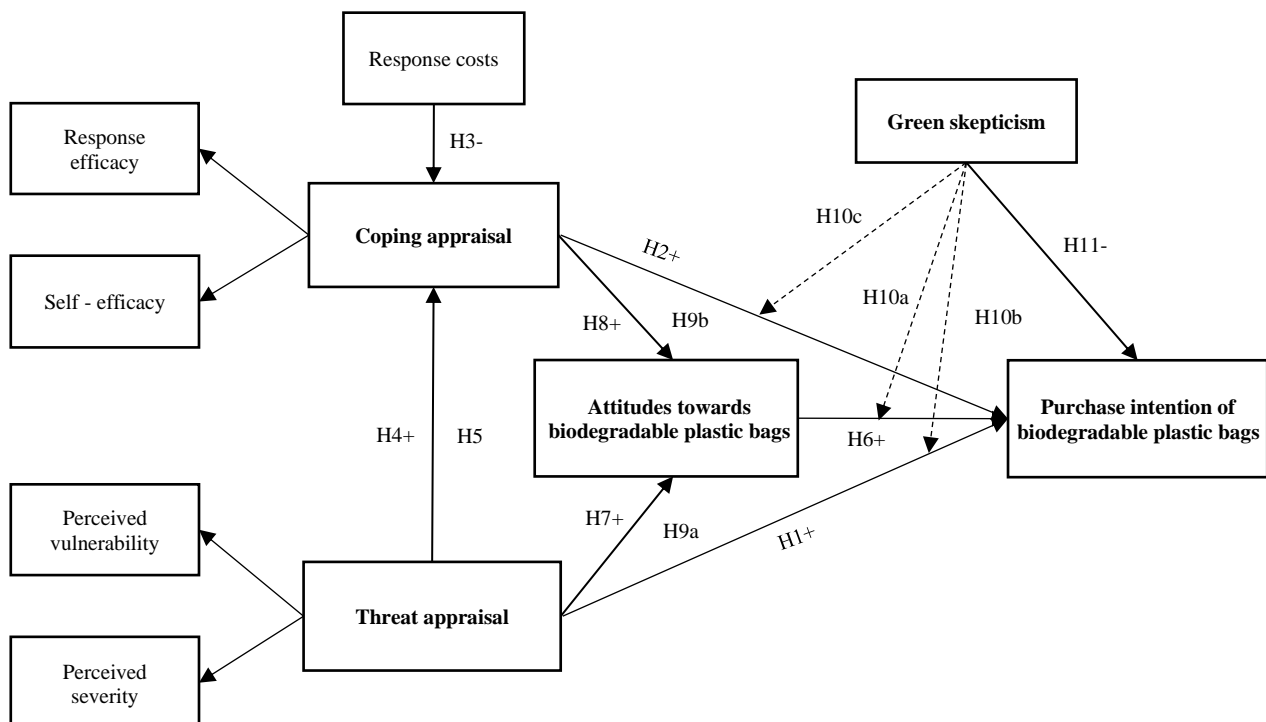


Figure 1. The proposed research model

3- Methods

3-1-Methodology

The mixed research methods, qualitative and quantitative were applied in this study, which were showed in Figure 2:

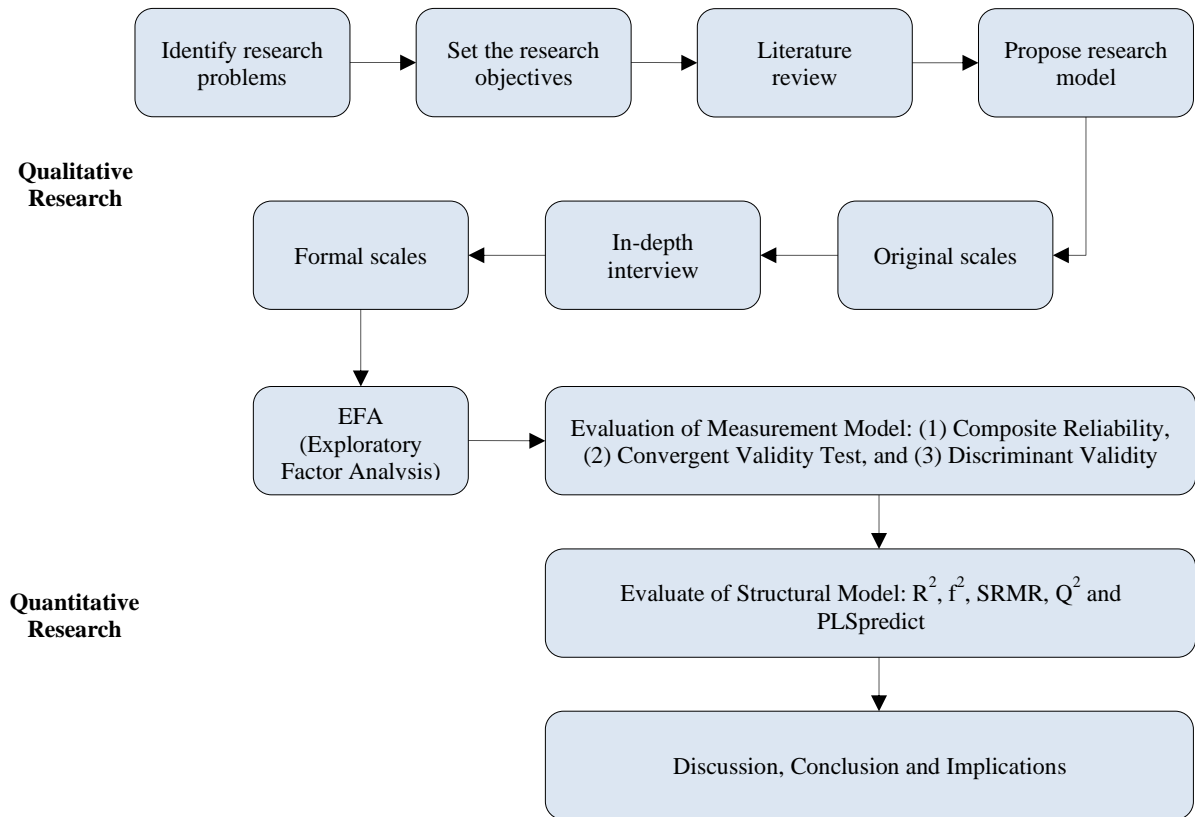


Figure 2. The research processes

3-2-Measurements

As mentioned, the scale contains 36 observed variables after a literature review and in-depth interviews with experts and directors. A 5-point Likert scale questionnaire was used because it was suitable for the characteristics of the study. The measurement scales in this study were adapted from reliable research. Four measurement items of perceived severity were adapted from Ibrahim & Al-Ajlouni (2018) [16], while the scale of perceived vulnerability was adapted from Ibrahim & Al-Ajlouni (2018) [16] and Shafiei & Maleksaeidi (2020) [61]. Five measurement items of self-efficacy were adapted from Ibrahim & Al-Ajlouni (2018) [16] and Chen (2020) [17], the scale of response efficacy was adapted from Ibrahim & Al-Ajlouni (2018) [16] and Almarshad (2017) [18], and the scale of response costs was adapted from Ibrahim & Al-Ajlouni (2018) [16]. In addition, the scale of attitudes toward biodegradable plastic bags was adapted from Alam et al. (2023) [55], and Wang et al. [56]. Four measurement items of green skepticism were adapted from Leonidou & Skarmas (2017) [62]. Finally, five measurement items of purchase intention toward biodegradable plastic bags were adapted from Ibrahim and Al-Ajlouni (2018) [16] and Tan et al. (2022) [20].

3-3-Data collection

This study applied a convenient random sampling method, and it was a cross-sectional study. According to the recommendations of Comrey & Lee (1992), the sample sizes were categorized as follows: 100 = poor, 200 = fair, 300 = good, 500 = very good, and 1,000 or more = excellent. To ensure appropriateness when using the SEM model, Tabachnick (2007) [63] also suggested that a sample size of 300 was good and over 500 was very good. For this research topic, the author estimated a sample size of approximately 850 respondents, which included 450 online and 400 offline. The objective of the survey was to obtain results that met the research objectives. The target respondents for the survey were consumers who lived in Southeast Vietnam.

3-4-Measurement Model Analysis

This study integrated three theories to explore the purchase intention toward biodegradable plastic bags, which are not popular to Vietnamese consumers. The proposed research model includes moderating relationships and mixed higher-order variables. Therefore, because this study was exploratory research and contained mixed higher-order variables, a partial least squares structural model would be applied in this study to analyze the complex research model [64]. SmartPLS software was used to test the hypotheses and interpret the results of the structural equation modeling.

4- Results

4-1-Descriptive statistics

After synthesizing the results, the author obtained 828 valid respondents and eliminated 22 invalid respondents. Figure 3 shows that among the 828 respondents, there are 440 females, accounting for 53.14%, which is higher than males. Figure 4 shows that the age group of 35–45 years old has the most significant proportion of 32.6% (270 respondents), 251 respondents are from the age group of 46–54 years old (30.31%), and 219 respondents are from the age group of 25–34 years old (26.45%). Table 1 shows that 213 respondents are unmarried (25.72%), 168 respondents are married and have no children (20.29%), and 446 respondents are married and have children (53.86%). The results are consistent with the operation of the survey, where most of the respondents are consumers who visited the supermarkets.

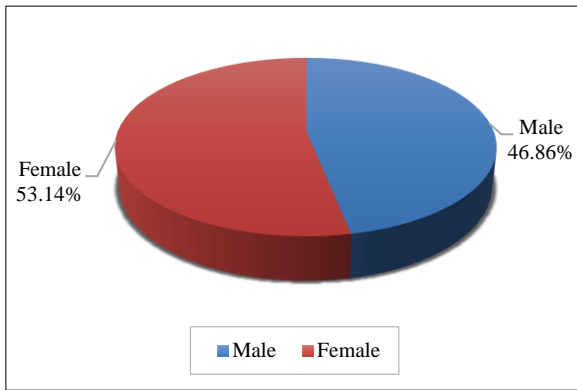


Figure 3. Percentage of age

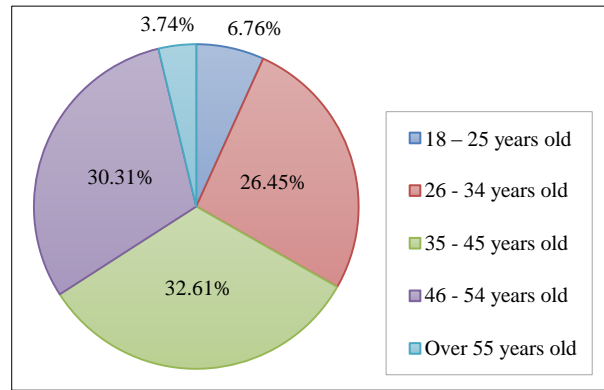


Figure 4. Percentage of age

Table 1. Descriptive statistics

Gender	828	100%
Male	388	46.86%
Female	440	53.14%
Age	828	100%
18 – 25 years old	56	6.76%
26 - 34 years old	219	26.45%
35 - 45 years old	270	32.61%
46 - 54 years old	251	30.31%
Over 55 years old	31	3.74%
Marital Status	828	100%
Unmarried	213	25.72%
Married and no children	168	20.29%
Married and have children	446	53.86%
Divorced	1	0.12%
Educational Level	828	100%
Middle school, High school	23	2.78%
Intermediate level	35	4.23%
College	120	14.49%
University	609	73.55%
Postgraduate	41	4.95%
Income	828	100%
Under 450 USD	28	3.38%
From 450 USD - 650 USD	155	18.72%
From 650 USD - 850 USD	462	55.80%
From 850 USD - 1,300 USD	130	15.70%
From 1,300 USD - 1,750 USD	39	4.71%
Over 1,750 USD	14	1.69%

Table 1 also shows that most respondents' educational level is university degrees, with 609 surveyors accounting for 73.55%, followed by college with 120 respondents, accounting for 14.49%, postgraduate degrees and intermediate levels have little difference at 16.8% and 16.1%, respectively, and the lowest is middle school or high school, which accounts for only 2.78%. Regarding income, 462 respondents have income from 650 USD to 850 USD, accounting for the highest percentage of 55.8%; 155 respondents (26.4%) have income from 450 USD to 650 USD; 130 respondents (15.7%) have income from 850 USD to 1,300 USD; 39 respondents (4.71%) have income from 1,300 USD to 1,750 USD; 28 respondents (3.38%) have income under 450 USD; and 14 respondents (1.69%) have income over 1,750 USD. The results are consistent with the average income of people living in the Southeast region of Vietnam.

4-2- Common Method Bias (CMB) and Multicollinearity

SPSS 24 software was applied to perform the Harman single-factor test for data screening. The results show that a single factor only accounts for 21.635% of the total variance (< 50%). According to Cooper et al. (2020) [65], the dataset has no common bias problems when the difference is under 50%. The authors also performed normality tests with Kurtosis and Skewness; the results within the range of ± 1.96 mean that the data is normally distributed [64]. The authors also calculated the variance inflation factors (VIFs) of all the observed variables, which varied from 1.423 to 2.436 (< 3). All results are under 3, so multicollinearity does not occur [64].

4-3- Exploratory Factor Analysis of Observed Variables

According to Table 2, there are 7 factors that are extracted based on the criterion of eigenvalue greater than 1, so these 7 factors best summarize the information of the 36 observed variables that are included in the EFA. The total variance extracted by these 7 factors is 64.545% > 50%; thus, the 7 extracted factors explain 64.545% of the data variance of the 36 observed variables participating in EFA [64].

Table 2. Total variance explained of observed variables

Factor	Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.481	22.348	22.348	6.038	20.822	20.822	4.194
2	3.867	13.334	35.683	3.388	11.684	32.506	4.056
3	2.498	8.612	44.295	2.075	7.155	39.661	3.447
4	2.004	6.910	51.204	1.563	5.389	45.051	2.675
5	1.784	6.151	57.355	1.309	4.515	49.566	2.950
6	1.058	3.650	61.005	0.639	2.204	51.769	4.083
7	1.027	3.540	64.545	0.551	1.901	53.670	3.485

According to Table 3, the authors excluded two observed variables, PV1 and PV6, because these observed variables had mixed factor loadings or had a factor loading under 0.5. After excluding PV1 and PV6, there were 34 remaining observed variables. The EFA's results for each independent variable show that KMO is greater than 0.5 (0.866 > 0.5), the Sig of the Bartlett test is 0.000 (< 0.05), and all the remaining factor loading coefficients are greater than 0.5. According to the EFA's results, there is no case of factor loading on both factors simultaneously or with factor loading close to each other [64]. Therefore, the factors ensure convergent and discriminant validity when analyzing EFA. In addition, there is no disturbance of factors, meaning there is no mixing between observed variables.

Table 3. EFA's results of independent variables and mediators

	Pattern Matrix											
	Component											
	1	2	3	4	5	6	7	8	9	10	11	
SE1	0.806											
SE2	0.752											
SE3	0.674											
SE4	0.638											
SE5	0.611											
PV2		0.817										
PV4		0.797										
PV3		0.735										
PV5		0.609										
ATT2			0.848									
ATT1			0.794									
ATT3			0.782									
ATT4			0.629									
RC3					0.830							
RC1					0.719							
RC2					0.644							
RC4					0.639							
SKEP4							0.838					
SKEP1							0.677					
SKEP3							0.662					
SKEP2							0.585					
RE2									0.802			
RE3									0.755			
RE4									0.592			
RE1									0.557			
PS3										0.816		
PS4										0.613		
PS2										0.485		
PS1										0.459		
Extraction Method: Principal Axis Factoring.												
Rotation Method: Promax with Kaiser Normalization.												
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.											0.866	
Approx. Chi-Square											10182.471	
Bartlett's Test of Sphericity											df	406
											Sig.	0.000

According to Table 4, the authors excluded one observed variable, PI5, because the observed variable had a factor loading under 0.5. After excluding PI5, there were 33 remaining observed variables. The EFA's results for the mediator and dependent variables are the same. According to Table 4, the KMO is greater than 0.5 ($0.883 > 0.5$), the Sig of the Bartlett test is 0.000 (< 0.05), and all the remaining factor loading coefficients are greater than 0.5. According to the EFA's results, there is no case of factor loading on both factors simultaneously with loading factors close to each other [64]. Therefore, the factors ensure convergent and discriminant validity when analyzing EFA. In addition, there is no disturbance of factors, meaning there is no mixing between observed variables.

Table 4. EFA's results of mediators and dependent variable

Pattern Matrix ^a		
	Factor	
	1	2
PI3	0.853	
PI4	0.794	
PI1	0.784	
PI2	0.691	
ATT1		0.833
ATT2		0.802
ATT3		0.777
ATT4		0.611
Extraction Method: Principal Axis Factoring.		
Rotation Method: Promax with Kaiser Normalization.		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.883
	Approx. Chi-Square	3417.743
Bartlett's Test of Sphericity	df	28
	Sig.	0.000

4-4- Measurement of SEM of First-order Variables

According to Table 5, after excluding PV1, PV6, and PI5 as observed variables, the authors performed the reliability test of the scales. The reliability of the scales is accepted when Cronbach's alpha (CA) is more significant than 0.7, the composite reliability (CR) is more significant than 0.7, and the average variance extracted (AVE) is more significant than 0.5 [64]. In addition, Table 6 shows that all HTMT values are below the threshold of 0.85, and all the observed variables achieve discriminant validity [67]. The results show that all the remaining first-order variables meet the criteria for higher-order variable testing [64].

Table 5. Outer loading, reliability and validity of first-order variables

Scale	Loading	CA	CR (rho_c)	AVE	VIFs	Scale	Loading	CA	CR (rho_c)	AVE	VIFs
RE		0.829	0.887	0.664		ATT		0.85	0.899	0.691	
RE1	0.722				1.531	ATT1	0.831				2.063
RE2	0.841				1.423	ATT2	0.854				2.214
RE3	0.867				2.058	ATT3	0.870				2.187
RE4	0.822				2.125	ATT4	0.766				1.615
SE		0.835	0.883	0.603		PV		0.825	0.884	0.656	
SE1	0.796				1.819	PV2	0.870				2.189
SE2	0.767				1.879	PV3	0.784				2.436
SE3	0.815				1.779	PV4	0.789				1.779
SE4	0.786				1.811	PV5	0.794				1.642
SE5	0.714				2.024						
RC		0.801	0.87	0.625		PS		0.771	0.853	0.593	
RC1	0.789				1.677	PS1	0.762				1.440
RC2	0.792				1.506	PS2	0.780				1.585
RC3	0.825				1.859	PS3	0.775				1.522
RC4	0.756				1.517	PS4	0.762				1.785
SKEP		0.778	0.857	0.6	1.581	PI		0.872	0.912	0.723	
SKEP1	0.801				1.443	PI1	0.821				1.93
SKEP2	0.719				1.582	PI2	0.838				2.039
SKEP3	0.775				1.729	PI3	0.875				2.371
SKEP4	0.800				1.581	PI4	0.866				2.28

Table 6. Heterotrait - Monotrait (HTMT) criterion correlation of first-order variables

	ATT	PI	PS	PV	RC	RE	SE	SKEP
ATT								
PI	0.658							
PS	0.345	0.582						
PV	0.255	0.488	0.732					
RC	0.132	0.157	0.099	0.235				
RE	0.409	0.339	0.148	0.208	0.322			
SE	0.28	0.305	0.176	0.251	0.297	0.741		
SKEP	0.212	0.551	0.489	0.388	0.14	0.139	0.117	

4-5-Measurement of SEM of Higher-order Variables

After retrieving the latent variable scores of higher-order variables (coping appraisal (CA) and threat appraisal (TA), the authors started to test the 2nd step of the model. Table 7 shows that the reliability of the scales is accepted when Cronbach’s alpha (CA) and the composite reliability (CR) are more significant than 0.7 and the average variance extracted (AVE) is more significant than 0.5 [64]. Table 6 also shows the variance inflation factors (VIFs) of all the observed variables (including latent variable scores), which vary from 1.445 to 2.214. All the VIFs value are under 3, demonstrating that multicollinearity does not occur [64]. In addition, Table 8 shows that all HTMT values are below the threshold of 0.85, and all the observed variables achieve discriminant validity [67].

Besides that, Henseler et al. (2015) [67] also proposed the method of using the difference in correlation between the actual data and the predicted model (Standardized Root Mean Square Residual - SRMR) of 0.08 as a criterion to measure the fit of the model to market data (Goodness of Fit - GoF). According to Table 9, the standardized root mean square residual (SRMR) of the model is 0.067 under 0.08, which means that the proposed research model is a good fit [64].

Table 7. Outer loading, reliability and validity of higher-order variables

Scale	Indicator Loading	CA	CR (rho_c)	AVE	VIF	Scale	Indicator Loading	CA	CR (rho_c)	AVE	VIF
TA		0.741	0.885	0.794		CA		0.765	0.894	0.809	
LV scores - PS	0.903				1.530	LV scores - RE	0.917				1.622
LV scores - PV	0.879				1.530	LV scores - SE	0.881				1.622
ATT		0.85	0.899	0.691		PI		0.872	0.912	0.723	
ATT1	0.831				2.063	PI1	0.821				1.930
ATT2	0.854				2.214	PI2	0.838				2.039
ATT3	0.870				2.187	PI3	0.875				2.371
ATT4	0.766				1.615	PI4	0.866				2.280
RC		0.801	0.87	0.625		SKEP		0.778	0.857	0.6	
RC1	0.79				1.674	SKEP1	0.801				1.582
RC2	0.792				1.502	SKEP2	0.719				1.445
RC3	0.823				1.859	SKEP3	0.775				1.593
RC4	0.757				1.518	SKEP4	0.800				1.727

Table 8. Heterotrait - Monotrait (HTMT) criterion correlation of higher-order variables

	ATT	CA	PI	RC	SKEP	TA
ATT						
CA	0.403					
PI	0.658	0.376				
RC	0.132	0.363	0.157			
SKEP	0.212	0.119	0.551	0.14		
TA	0.35	0.254	0.625	0.19	0.511	

Table 9. Model fit

	Saturated model	Estimated model
SRMR	0.067	0.069
d_ULS	0.941	1
d_G	0.325	0.323
Chi-square	1664.575	1650.3
NFI	0.771	0.772

4-6- Structural Model Results

The authors used the bootstrapping method with a sample size of 10,000 to test the structural model. According to Chin (1998) [68] and Hair et al. (2021) [64], the authors tested the determination coefficient (R^2), the statistical significance, and the path coefficient relevance. Table 10 shows that all the path coefficients in the model are significant, with 95% confidence interval results. The confidence interval does not contain a value of 0. The p-values of all relationships are less than 0.05, indicating that all the relationships are supported.

Table 10. The path coefficients

Hypotheses	Relationship	β	Sample mean	Confidence intervals	Standard deviation	T statistic	P-value	VIF	Conclusion
<i>Direct effect</i>									
H1	TA → PI	0.188	0.188	[0.136–0.235]	0.025	7.476	0.000	1.358	Supported
H2	CA → PI	0.126	0.125	[0.072–0.179]	0.027	4.607	0.000	1.181	Supported
H3	RC → CA	-0.266	-0.267	[-0.326 to -0.206]	0.030	8.742	0.000	1.020	Supported
H4	TA → CA	0.150	0.151	[0.090 – 0.209]	0.030	4.957	0.000	1.020	Supported
H6	ATT → PI	0.432	0.433	[0.382 – 0.483]	0.025	17.105	0.000	1.251	Supported
H7	TA → ATT	0.228	0.228	[0.165 – 0.289]	0.031	7.336	0.000	1.036	Supported
H8	CA → ATT	0.288	0.288	[0.226 – 0.351]	0.032	9.086	0.000	1.036	Supported
H11	SKEP → PI	-0.233	-0.234	[-0.288 to -0.179]	0.027	8.585	0.000	1.410	Supported
<i>Indirect effect</i>									
H5	TA ⇒ CA ⇒ PI	0.019	0.019	[0.009 – 0.031]	0.006	3.367	0.001		Supported (Partial mediation)
H9a	TA ⇒ ATT ⇒ PI	0.098	0.099	[0.071 – 0.126]	0.014	7.137	0.000		Supported (Partial mediation)
H9b	CA ⇒ ATT ⇒ PI	0.124	0.125	[0.094 – 0.159]	0.017	7.478	0.000		Supported (Partial mediation)
<i>Moderator effect</i>									
H10a	SKEP × ATT ⇒ PI	-0.131	-0.133	[-0.187 to -0.080]	0.027	4.785	0.000	1.322	Supported
H10b	SKEP × TA ⇒ PI	-0.14	-0.14	[-0.180 to -0.102]	0.02	7.044	0.000	1.406	Supported
H10c	SKEP × CA ⇒ PI	-0.135	-0.135	[-0.186 to -0.087]	0.025	5.357	0.000	1.137	Supported
<i>R² adjusted</i>									
$R^2_{ATT} = 0.157$									
$R^2_{CA} = 0.102$									
$R^2_{PI} = 0.606$									
<i>f²</i>									
$f^2_{ATT \Rightarrow PI} = 0.382$									
$f^2_{CA \Rightarrow ATT} = 0.095$									
$f^2_{CA \Rightarrow PI} = 0.034$									
$f^2_{RC \Rightarrow CA} = 0.077$									
$f^2_{TA \Rightarrow ATT} = 0.059$									
$f^2_{TA \Rightarrow CA} = 0.025$									
$f^2_{TA \Rightarrow PI} = 0.067$									
$f^2_{SKEP \Rightarrow PI} = 0.099$									
$f^2_{SKEP \times ATT \Rightarrow PI} = 0.031$									
$f^2_{SKEP \times TA \Rightarrow PI} = 0.057$									
$f^2_{SKEP \times CA \Rightarrow PI} = 0.035$									

Table 10 also shows that the standardized beta coefficients of the direct relationships between $ATT \Rightarrow PI$ are 0.432, $CA \Rightarrow ATT$ is 0.288, $CA \Rightarrow PI$ is 0.126, $RC \Rightarrow CA$ is -0.266, $TA \Rightarrow ATT$ is 0.228, $TA \Rightarrow CA$ is 0.150, $TA \Rightarrow PI$ is 0.188, $SKEP \Rightarrow PI$ is -0.233. The results mean that attitudes (ATT), coping appraisal (CA), and threat appraisal (TA) positively and directly influence on the purchase intention toward biodegradable plastic bags, which mean higher attitudes, higher coping appraisal and higher threat appraisal can lead to higher purchase intention. On the other hand, green skepticism (SKEP) negatively and directly influences on the purchase intention, which means higher green skepticism will lead to lower purchase intention toward biodegradable plastic bags. Furthermore, the response costs (RC) negatively and directly influence on coping appraisal (CA). The results are consistent with the protection motivation theory when higher response costs can lower coping appraisal. Therefore, the hypotheses H1, H2, H3, H4, H6, H7, H8, H11 are supported. The results also show that the standardized beta coefficients of the mediating relationships between $CA \Rightarrow ATT \Rightarrow PI$ is 0.124, $TA \Rightarrow ATT \Rightarrow PI$ is 0.098, and $TA \Rightarrow CA \Rightarrow PI$ is 0.019. The hypotheses H5, H9a, and H9b are supported by the mediating role of attitudes (ATT) and coping appraisal (CA) in the model. In addition, the moderating roles of green skepticism (SKEP) in the relationship between $ATT \Rightarrow PI$, $TA \Rightarrow PI$, $CA \Rightarrow PI$, are also significant with the standardized $\beta = -0.131$, $\beta = -0.135$, $\beta = -0.140$, respectively. The results support hypotheses H10a, H10b, and H10c, which mean higher SKEP will decrease the impact of $ATT \Rightarrow PI$, $TA \Rightarrow PI$ and $CA \Rightarrow PI$ (please refer to Figures 5 to 7). In summary, the results of the PLS-SEM model show that eight direct effects, three indirect effects, and three moderating effects are accepted.

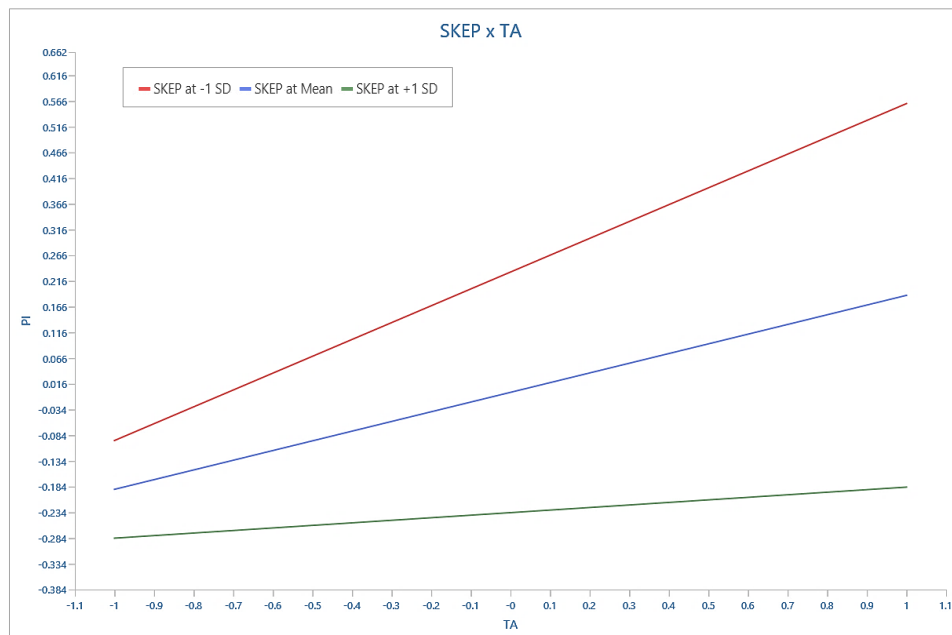


Figure 5. Moderating effect of SKEP on TA to PI

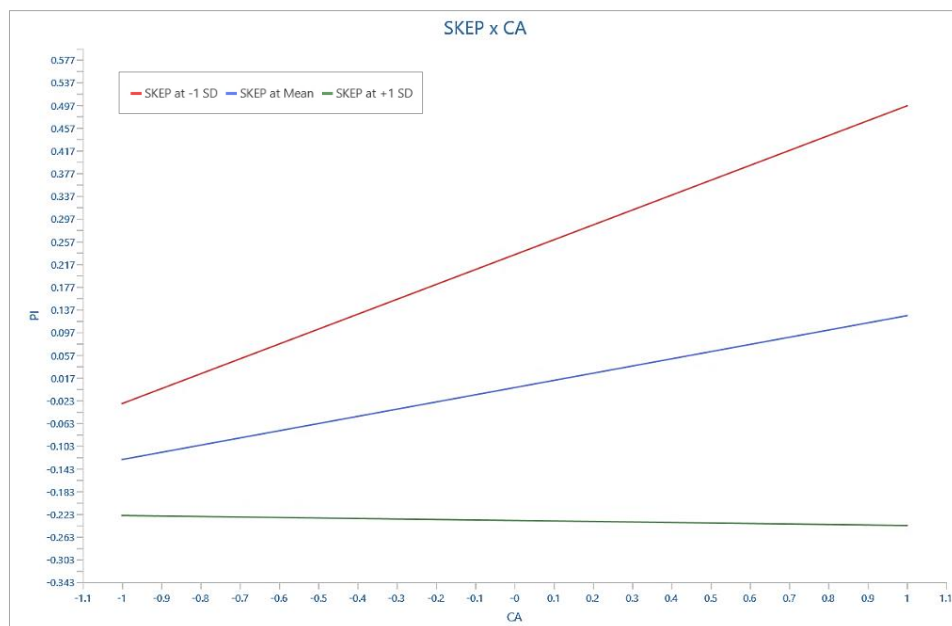


Figure 6. Moderating effect of SKEP on CA to PI

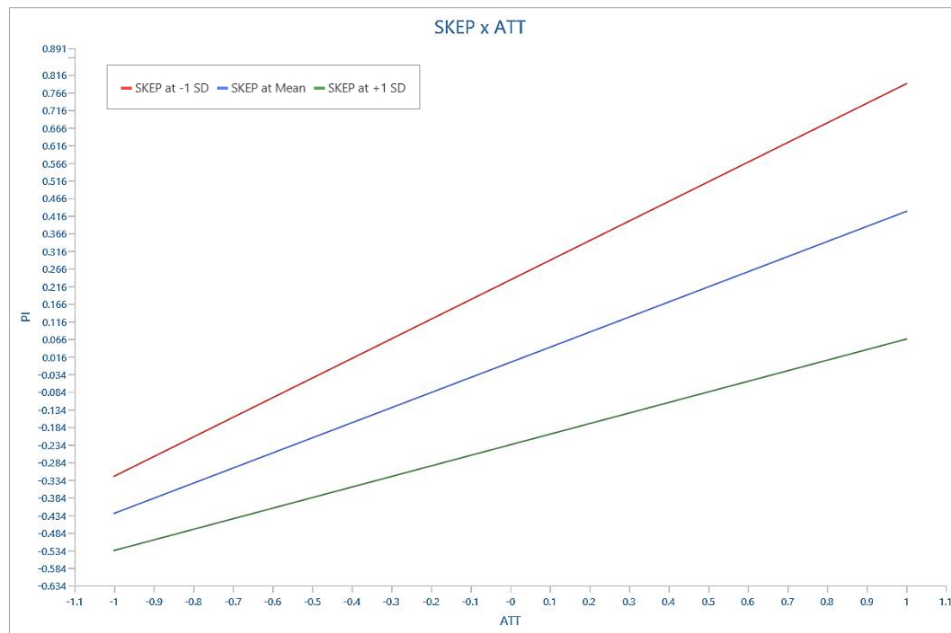


Figure 7. Moderating effect of SKEP on ATT to PI

Besides, according to Hair et al. (2021) [64], the impact of independent factors on dependent factors (f^2) varies from weak (0.02) to strong (above 0.35). The results of Table 10 show that attitudes have a strong impact on purchase intention (f^2 ATT \Rightarrow PI = 0.382), green skepticism, threat appraisal, and coping appraisal have a weak impact on purchase intention toward biodegradable plastic bags (f^2 SKEP \Rightarrow PI = 0.099; f^2 TA \Rightarrow PI = 0.067; f^2 CA \Rightarrow PI = 0.034). Coping appraisal and threat appraisals weakly impact attitudes toward biodegradable plastic bags (f^2 CA \Rightarrow ATT = 0.095; f^2 TA \Rightarrow ATT = 0.059), while threat appraisals weakly impact coping appraisal (f^2 TA \Rightarrow CA = 0.025). Response costs have a negative and weak impact on coping appraisal (f^2 RC \Rightarrow CA = 0.077). Besides, green skepticism weakly moderates the relationship between threat appraisal - purchase intention, coping appraisal - purchase intention, and attitudes - purchase intention (f^2 SKEP \times TA \Rightarrow PI = 0.057; f^2 SKEP \times CA \Rightarrow PI = 0.035; f^2 SKEP \times ATT \Rightarrow PI = 0.031). The results are similar to the standardized beta coefficients above.

- H1.** Threat appraisal positively and directly influences on the purchase intention toward biodegradable plastic bags.
- H2.** Coping appraisal positively and directly influences the purchase intention toward biodegradable plastic bags.
- H3.** Response costs negatively and directly influence coping appraisal.
- H4.** Threat appraisal positively and directly influences coping appraisal.
- H5.** Coping appraisal mediates the relationship between threat appraisal and the purchase intention toward biodegradable plastic bags.
- H6.** Attitudes positively influences purchase intention toward biodegradable plastic bags.
- H7.** Threat appraisal positively and directly influences attitudes toward biodegradable plastic bags.
- H8.** Coping appraisal positively and directly influences attitudes toward biodegradable plastic bags.
- H9a.** Attitudes mediates the relationship between coping appraisal and purchase intention toward biodegradable plastic bags.
- H9b.** Attitudes mediates the relationship between threat appraisal and purchase intention toward biodegradable plastic bags.
- H10a.** Green skepticism negatively and significantly moderates the relationship between attitudes and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of attitudes on purchase intention.
- H10b.** Green skepticism negatively and significantly moderates the relationship between threat appraisal and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of threat appraisal on purchase intention.
- H10c.** Green skepticism negatively and significantly moderates the relationship between coping appraisal and purchase intention toward biodegradable plastic bags, such that higher skepticism will decrease the impact of coping appraisal on purchase intention.
- H11.** Green skepticism negatively and directly influences purchase intention toward biodegradable plastic bag.

4-7-Prediction Power of the Model

According to Shmueli et al. (2019) [69], if the Q^2 values are greater than 0, meaning that the model has predictive relevance. Then, the next step is to evaluate PLS_RMSE or PLS_MAE in the PLSpredict. In Table 11, the Q^2 values of all the observed variables of ATT, CA, and PI are greater than 0, which means the model has predictive relevance. There are five observed variables with PLS-SEM_RMSE index, which are smaller than ten observed variables with LM_RMSE; so, the proposed model has medium predictive power [69]. The PLS-SEM_RMSE index is selected because the PLS-SEM MV error histogram is normally distributed [69].

Table 11. Prediction power of the model

	Q^2 predict	PLS-SEM_RMSE	LM_RMSE
ATT1	0.044	1.118	1.112
ATT2	0.050	1.068	1.025
ATT3	0.073	1.167	1.133
ATT4	0.040	1.153	1.125
LV scores - RE	0.082	0.959	0.963
LV scores - SE	0.079	0.961	0.962
PI1	0.299	0.849	0.864
PI2	0.188	0.947	0.943
PI3	0.360	0.901	0.933
PI4	0.279	0.875	0.892

4-8-Discussion

The results show that hypotheses H1 and H2 are all supported, which means that threat appraisal (TA) and coping appraisal (CA) positively and directly influence the purchase intention toward biodegradable plastic bags with beta coefficients of 0.188 and 0.126, respectively. The results are similar to previous studies by Ibrahim and Al-Ajlouni (2018) [16], Chen (2020) [17], and Bockarjova & Steg (2014) [29], which mean that higher PMT constructs such as coping appraisal or threat appraisal will lead to the intention to eliminate the threat to the environment, such as purchase intention toward biodegradable plastic bags. However, the research of Pang et al. (2021) [19] and Tan et al. (2022) [20] shows different results from this study: Only self-efficacy in coping appraisal positively and directly influences purchase intention toward organic food, which is different from the majority research about PMT. The differences may be about the mediating effect of subjective norms and attitudes toward adopting pro-environmental behavior [19, 20]. Hypothesis H6 is supported, which means that attitudes positively influence the purchase intention toward biodegradable plastic bags with beta coefficients of 0.432. The results show that attitudes have the most substantial impact on the purchase intention toward biodegradable plastic bags. The results are consistent with the theory of planned behavior and are similar to the studies of Qi & Ploeger (2021) [34] and Sadiq et al. (2023) [54].

Hypothesis H3 is supported, which means that response costs (RC) negatively influence coping appraisal (CA) with a beta coefficient of -0.266. This result was similar to the studies of Zhang et al. (2021) [45] and Zhang et al. (2023) [46]. However, the results of this study are also different from the research of Ibrahim and Al-Ajlouni (2018) [16], where response costs significantly reduce the coping appraisal of consumers. The only explanation for this unexpected outcome is the high cost of biodegradable plastic bags. Hypothesis H4 is supported, meaning that threat appraisal positively and directly influences coping appraisal with a beta coefficient of 0.150. The results explain that the threat appraisal process will come first, followed by the coping appraisal process, similar to the studies of Plotnikoff & Trinh (2010) [50] and Yasami (2021) [51]. The results also show that hypotheses H7 and H8 are supported, which means that threat appraisal and coping appraisal positively and directly influence consumers' attitudes toward biodegradable plastic bags, with a beta coefficient of 0.228 and 0.288, respectively. These findings are similar to the arguments of Cismaru & Lavack (2006) [25] about changing attitudes toward behavior through PMT constructs. Hypothesis H11 is also supported, which means that green skepticism negatively and directly influences the purchase intention toward biodegradable plastic bags. The results are similar to the study of Sääksjärvi & Morel (2010) [59], explaining that consumers usually raise skepticism toward new products, and skepticism can reduce the purchase intention toward these new products.

Hypothesis H5 is supported, showing that coping appraisal mediates the relationship between threat appraisal and purchase intention toward biodegradable plastic bags with a beta coefficient of 0.019. The hypotheses H9a and H9b are also supported, showing that attitudes mediate the relationship between threat appraisal and purchase intention, coping appraisal, and purchase intention with a beta coefficient of 0.098 and 0.124, respectively. The results are similar to the studies of Pang et al. (2021) [19] and Tan et al. (2022) [20]. Besides, the research of Pang et al. (2021) [19] and Tan et

al. (2022) [20] proves the full mediating role of attitudes in the PMT model, while in this study, attitudes only play a partial mediating role. Pang et al. (2021) [19] and Tan et al. (2022) [20] explained this difference because of the Millennials age group, who need to be more experienced with climate change. However, in the authors' opinions, the only explanation for this difference is that consumers do not find a link between purchase behavior toward organic foods and environmental protection.

Hypothesis H10a is supported by a beta of -0.131, which means that the higher the green skepticism will weaken the relationship between attitudes and purchase intention toward biodegradable plastic bags. The results are very similar to the study of Uddin et al. (2023) [23], explaining that Asian consumers are also very skeptical about new products; they are prudent in purchasing even if they like these new products. The hypotheses H10b and H10c with the beta of -0.140 and -0.135, which means that green skepticism significantly influences the relationship between appraisal processes and behavioral intention. The higher green skepticism will weaken the relationship between threat appraisal and purchase intention, coping appraisal and purchase intention. The results can explain the gap between appraisal processes and behavioral intention based on the arguments of Byrd et al. (2022) [27] and Deliana & Rum (2019) [21]. The explanation for this situation is that the threat appraisal and coping appraisal of the consumer are not strong enough to override the skepticism.

5- Conclusion and Implications

5-1- Conclusion

Based on the research model, the authors measured the relationship between coping appraisal, threat appraisal, attitudes, green skepticism, and consumers' purchase intention toward biodegradable plastic bags under the mediating role of attitudes or coping appraisal and the moderating role of green skepticism. The results show that attitudes have the most substantial impact on consumers' purchase intention ($\beta = 0.432$), followed by green skepticism ($\beta = -0.233$), threat appraisal ($\beta = 0.188$), and coping appraisal ($\beta = 0.126$). Response costs also negatively influence coping appraisal, with $\beta = -0.266$. Besides, coping appraisal partially mediates the relationship between coping appraisal and purchase intention toward biodegradable plastic bags ($\beta = 0.019$). Attitudes also partially mediate the relationship between coping appraisal and purchase intention ($\beta = 0.124$), threat appraisal and purchase intention ($\beta = 0.098$). Besides, green skepticism moderates the relationship between attitudes and purchase intention ($\beta = -0.131$), coping appraisal and purchase intention ($\beta = -0.135$), and threat appraisal and purchase intention ($\beta = -0.140$).

This study is conducted to analyze the purchase intention toward biodegradable plastic bags as the top priority to reduce plastic pollution. Based on the results, some managerial implications will be proposed for plastic companies in Vietnam to switch their production toward biodegradable plastic bags. When switching their production toward biodegradable plastic bags, plastic companies in Vietnam can adapt to the new regulations from the Vietnamese government and the current situation of a polluted environment. Academically, this study once again confirms the theory of planned behavior and explores the relationship between the protection motivation theory, the theory of planned behavior, and the attitudes-behavior-context theory in the current situation. This study also solves the perception-behavior and attitude-behavior gaps, which were mentioned in previous studies. This research can also serve as a reference for future studies on sustainable consumption.

5-2- Managerial Implications

Based on the results of this study, the authors will propose some managerial implications for plastic manufacturers in Vietnam to switch their production to biodegradable plastic bags by increasing Vietnamese consumers' purchase intentions. Firstly, marketing campaigns can be implemented using traditional and online advertising with strong media messages. The media messages of these advertisements can mention the threat of plastic pollution that consumers may face to trigger their coping and threat appraisal processes and increase the consumers' attitudes toward the product. These advertisements can also guide them to eliminate that threat by buying biodegradable plastic bags, which can solve plastic pollution in Vietnam. Secondly, green skepticism is also a problem that significantly reduces consumers' purchase intention or negatively reduces the impact of attitudes and the appraisal processes of consumers on purchase intention. The purchase intention toward biodegradable plastic bags in Vietnam is relatively low (under a median of 3) because of high green skepticism, even though consumers' attitudes and appraisal processes are high (over the median of 3). Designing a package containing an eco-label and product attributes can solve the problem of high green skepticism. When consumers look at eco-labels and read product attributes, they can reduce their skepticism toward the products due to the clear information about the products. Finally, response costs, such as high costs or inconvenient buying of the products, are problems that reduce coping appraisal processes and purchase intention. Plastic manufacturers can propose that the Vietnamese government reduce taxes, thereby reducing production costs. The companies can also consider implementing new distribution channels by cooperating with minimarkets such as CircleK, WinMart, or GS25; customers can buy biodegradable plastic bags more easily.

5-3-Theoretical Implications

Previously, researchers such as Pang et al. (2021) [19] or Tan et al. (2022) [20] integrated the protection motivation theory and the theory of planned behavior to investigate the purchase behavior of organic food. However, these studies did not consider the gap between appraisal processes and behavioral intentions. This study is one of the new studies exploring the integrating mode that complied from three theories: protection motivation theory, theory of planned behavior, and attitudes-behavior-context theory, to fill the gap between appraisal processes and behavioral intention. Secondly, only about nine studies applied protection motivation theory to specific green products, such as biodegradable plastic bags. None of the nine studies had yet to explore the relationship between PMT constructs. Therefore, this study was the first to explore the impact of threat appraisal on coping appraisal in the research field of business administration. Future studies can implement the research model to explore the buying behavior of other green products. Finally, this study is one of the few studies that measured coping appraisal or threat appraisal as higher-order variables, which can help future studies better understand PMT constructs.

5-4-Limitations

This study also has limitations that future studies can explore. Firstly, this study is conducted with a scope limited to lower middle-income countries such as Vietnam. The results need to reflect the purchase intention toward biodegradable plastic bags in other countries with different incomes. Secondly, this study only applies psychological factors such as green skepticism to the model. Future studies can explore other psychological factors like fear, hope, trust, or ethical obligation to clarify consumers' purchase intentions and expand the research models. Thirdly, due to the argument of Cismaru & Lavack (2006) [25], the PMT constructs only influence consumers' attitudes and ignore other TPB constructs. Future studies can consider including other TPB constructs, such as subjective norms or perceived behavioral control, to have a broader view of green purchase behavior. Finally, due to limited research time, this study is cross-sectional and applies a convenient sampling method. Future researchers may consider operating a longitudinal study to explore the impact of coping appraisal and threat appraisal on the purchase behavior of biodegradable plastic bags.

6- Declarations

6-1-Author Contributions

Conceptualization, L.N.; methodology, L.N.; software, L.N.; validation, B.T.T. and T.N.G.; formal analysis, L.N.; investigation, B.T.T.; resources, T.N.G.; data curation, L.N.; writing—original draft preparation, L.N.; writing—review and editing, T.N.G.; visualization, B.T.T.; supervision, T.N.G.; project administration, L.N. All authors have read and agreed to the published version of the manuscript.

6-2-Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6-3-Funding

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6-4-Acknowledgements

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6-5-Institutional Review Board Statement

Not applicable.

6-6-Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

6-7-Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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