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Exploring the Consumer Behavior of Intention to Purchase Green Products in Belt and Road Countries: An Empirical Analysis

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Abstract: This study explored the consumer behavior of intention to purchase green products based on a decision-making model that integrates cognitive attributes, affective attributes, and behavioral intentions in Belt and Road countries. The questionnaires were collected from customers who previously purchased green products; this study distributed the questionnaires at the appliance section of the department stores and collected 227 valid responses. Environmental attitude, product attitude, social influence, and perceived monetary value positively affected purchase intention; among these attributes, product attitude most substantially affected purchase intention. Cognitive values (collective and individual) significantly and positively affected environmental and product attitudes. Regarding individual environmental literacy, objective knowledge did not significantly affect environmental attitude, whereas subjective knowledge positively and significantly affected product attitude. In addition, both environmental awareness and government role (extrinsic motivating attributes) significantly and positively affected environmental and product attitudes for sustainable consumption. Media exposure also exerted a significant positive effect on environmental attitude for reducing, reusing and recycling emissions.

Keywords: decision-making model; individual environmental literacy; perceived monetary value; sustainable consumption; reduce; reuse and recycle

1. Introduction

Environmental protection is a global concern. A global survey among nine developed countries indicated that 50% of respondents purchased green products, and 24% of respondents paid increased prices to buy green products [1]. Consumer intention to purchase is a crucial topic, irrespective of consumerism. There are, however, numerous attributes affecting a consumer's intention to purchase green products, stemming from environmental awareness, and environmental awareness has been discussed in past decades. This study investigates whether perceived monetary value and social influence affect consumer intention to purchase green products and explores how collectivism, individualism, objective knowledge, subjective knowledge, environmental awareness, the role of the government, media exposure, social influence, and perceived monetary value influence consumer attitudes toward the environment and products. The United Nations Environment Program [2] has estimated that the market for green products doubles annually. This statistic indicates that an increasing number of customers tend to buy green products. In the vast majority of studies, the argument is made that consumers do not purchase green products because of the green products' attributes [3–5].

This study implied that consumers do not consider green product attributes at all but instead are affected by other attributes, such as cognitive values, individual environmental literacy, price, and brand equity. Thus, the environmental attitude would be overruled by self-efficacy, the importance of product recycling, convenience, and unexpectedness. Therefore, this study explored the influence of environmental and product attitudes and purchase intention regarding green appliances based on the affective domain in the choice behavior model [6]. This study considered the Belt and Road Initiative (B&RI) countries. The Chinese government has promoted this initiative in the hopes of developing new market features.

Although the literatures argue that consumers do consider green product attributes [7–9], these considerations are often pushed to the background. This study proposed that there is a trade-off in the evaluation of green product attributes that influences purchasing decisions, e.g., consumers tend to focus on product attributes first followed by green product attributes. To examine this assumption, this study focused on the trade-off between green and other product attributes on purchasing intentions. Specifically, cognitive value, individual environmental literacy and extrinsic motivating attribute are likely to be important predictors of consumer purchasing behavior because they steer the focus to specific product attributes. The aim of this study was to examine our assumption that consumers tend to focus on product attributes first followed by green product attributes and how this relationship depends on one's values. In addition, a few studies have discussed the relationships among environmental knowledge, attitude, and behavior as being crucial [10–13]. Most consumers acquire information from the media; thus, the media plays a critical role in consumers' understanding of the environment. Governmental regulations (e.g., littering prohibitions and green product subventions) require consumers to pay attention to the environment and to products [14]. Increasing attention has been paid to environmental concerns; thus, government officials continue to encourage consumers to purchase green products. To satisfy these motivations, internal and external attributes affect consumer decisions regarding purchase intention [12,15]. Consumers collect product information based on cognitive value (collective and individual), individual environmental literacy (i.e., environmental knowledge and awareness), extrinsic motivating attribute (e.g., the role of government, media, and social influence), and perceived monetary value. Hence, customer intentions toward green products must be further explored in B&RI countries.

This study explored the attributes affecting consumer purchase and their intention, based on their choice behavior model [5]. Analysis attitude showed that the ability to recycle or reuse products strongly affects consumer purchase intention and that consumers evaluate the environmental effects of products based on their preferences and on environmental and product attitudes after collecting information. The results from this study provided a reference for the government and for businesses selling green appliances when conducting environmental policy adjustments in B&RI countries. Green products are new to the market, and compared with other products, their usefulness is relatively low when they do not satisfy consumer expectations (e.g., regarding energy savings), leading to a decrease in consumer intention to purchase green products [16]. Finally, consumers make decisions after evaluating whether the product and its environmental effects satisfy their demands. In other words, consumers evaluate preferred products or services based on cognitive (cognitive value, individual environmental literacy, extrinsic motivating attribute, and perceived monetary value) and affective (environmental attitude and product attitude) attributes when they decide to purchase products or services. When consumers finish collecting relevant information, people evaluate the environmental effects of products and make an appropriate decision. Thus, prior studies have examined a number of aspects related to selecting green products. This study elucidated the attributes affecting consumer behavior when selecting green appliances; explored how cognitive values (collective and individual), individual environmental literacy (objective and subjective knowledge and environmental awareness) and extrinsic motivating attributes (the role of the government and media exposure) affected environmental and product attitudes; and clarified how perceived monetary

value and social influence affected consumer purchase intention. The data provides a reference for government officials to use when modifying relevant environmental policies.

2. Literature Review

The importance of environmental protection and the price of green products have remained stable. Based on gathered research information, 76% of consumers in Hong Kong [17] purchased green products based on the label, and 83% of American consumers attended green activities and purchased green products. Although this indicates a trend toward purchasing green products [10,18], there are numerous barriers, such as high cost and lack of product knowledge, regarding these products. In the present market, these barriers prevent consumers from understanding how green products affect the environment. More than 80% of Taiwanese people pay additional money to buy products associated with environmental protection, and more than 60% of these consumers pay an additional 10% to purchase green products [19]. In addition, Taiwanese government officials have encouraged people to conserve energy and reduce their carbon dioxide production, promoting political issues regarding standardized energy prices. These political issues have generated NT\$97 billion within the green industry [1]. Although price remains a factor when deciding to purchase green products, consumers are willing to purchase products for sustainable consumption if the price remains within a normal, reasonable range.

This study investigated consumer purchase intention toward green products, based on the choice behavior model. Choice behavior is a continual decision-making process that involves initial purchase intention, accepted information, motivation, characteristic, plan evaluation, selection, and purchase before buying. Sheppard et al. [20] indicated that behavior affects the process of forming intention. In psychology, behavioral intentions are affected through cognitive and affective pathways. Hence, the choice behavior model was used in this study and is detailed in the following sections.

2.1. Cognitive Stage

Consumers begin to collect relevant information after generating purchase motivations. In addition to conducting internal surveys (i.e., assessing their experience or knowledge), consumers conduct external surveys to follow through with their purchase intention. The attributes detailed in the following sections affect this process. The collectivism model is often used when exploring environmentally oriented products and the value of eco-behaviors [21]. Collectivism is considered a crucial indicator of environmental protection [22]. Ramayah et al. [23] reported that collectivism positively affects environmental attitudes. Leonidou et al. [24] suggested that collectivism positively affects internal environmental attitudes, indicating that people seek products that yield environmental advantages. Collectivists believe that environmental damage caused by green products should be minimized (e.g., in the materials and manufacturing process used) and positively evaluate green products that meet their standards [7]. In this study, collectivism is defined as “the consumer’s will to do something that yields environmental advantages.”

In addition to the collectivism model, the individualism model is often used to investigate environmentally oriented products and the value of eco-behaviors [25]. Individualism may negatively affect environmental attitudes [6,24]. For example, individualists may consider product recycling inconvenient. In this study, individualism is defined as follows: “the level of advantage of green products for consumers is more important than people’s cognitive awareness of the product.” When people exhibit environmental knowledge, they understand the environment and the key attributes that affect it [26,27]. Jones and Eden [28] suggested that environmental knowledge can be divided into two parts: (a) objective knowledge (a general understanding of environmental knowledge) and (b) subjective knowledge (a specific understanding of or experience regarding environmental knowledge). Laroche and Barbaro [29] discussed the relationships among environmental knowledge, attitude, and behavior among Canadian consumers and determined that environmental knowledge is a poor marker for predicting the relationship between environmental attitudes and behaviors.

According to this experimental result, an eco-cognitive frame has been constructed [10,12]. Thus, discussions of environmental knowledge should be divided into objective and subjective knowledge in future studies. In this study, objective knowledge is defined as consumers' general understanding of the environment, and subjective knowledge is defined as consumers' specific understanding or experiences with the environment.

Environmental awareness indicates that environmental effects influence consumer cognition when purchasing green products [15,30]. People are paying increasing attention to environmental concerns (e.g., global warming and destruction of the ozone layer and natural habitats), and this may affect consumers' decisions to purchase green products. In this study, environmental awareness is defined as "the level to which environmental effects influence consumer cognition when purchasing green products."

2.2. Extrinsic Motivating Attributes

Government officials announce various policies or regulations to address continual consumption and development [14]. People who are interested in the environment believe that environmental protection is a governmental duty; thus, the government plays a crucial role in environmental protection [31]. Under certain conditions, governmental officials can attempt to convince people to consume responsibly, using legislation and enhancing public understanding to foster consumer consciousness and concern regarding the relationship between products and the environment [32]. In this study, the role of the government is defined as follows: "consumers believe that environmental protection is a governmental duty." In media exposure, members of the media propagate environmental protection concerns by rapidly sharing meaningful knowledge with the public [13,33]. Green products can be promoted in TV advertisements; however, print advertisements may facilitate the sharing of detailed information and establish product image recognition among consumers. Thus, ingredients or recycling details are printed on product packaging to attract consumers [34]. In this study, media exposure is defined as follows: "the media should assist in propagating environmental protection topics."

Social influence refers to observing the attitudes and behaviors of a person to change his or her self-faith and behaviors [35]; thus, purchase decisions are affected by family, friends, and the Internet [10]. Scholars have suggested that consumer intention to purchase products or green products is affected by the opinions of friends, social influences, and social cognitive values [16,36,37]. The opinions of others typically affect the intention to purchase green products. In this study, social influence is defined as follows: "consumers change their faith and cognitive values towards purchasing green products based on the opinions of others." In particular, the perceived monetary value refers to the product price level that is acceptable to consumers [38]. Consumers consider monetary value when evaluating products or services [39,40]. Thus, consumers who are willing to purchase green products consider the monetary value of these products, and green products are typically more expensive than ordinary products. Several studies have indicated that monetary value is a crucial factor affecting consumer use intention [26,41]. Lin and Huang [36] suggested that consumers are willing to pay additional money to purchase green products if they believe that the product benefits the environment. In this study, perceived monetary value is defined as "consumers believe that green products provide worthwhile value."

2.3. Affective Stage

Attitude belongs to the affective domain in the choice behavior model [36] indicating that consumers evaluate all options after collecting the necessary information.

De Medeiros and Ribeiro [4] defined environmental attitude as "individual faith, affective, and behavioral intention regarding environmental activities and issues." Kim [42] indicated that environmental attitude positively affects environmental behaviors. In this study, environmental attitude is defined as "consumer evaluations of environmental protection." Product attitude can be described as "consumer evaluations of green products." Tan [43] indicated that it is contradictory to predict environmental behaviors based on environmental attitudes. Bamber [44] indicated that the

difference between attitude and behavior relates to considering products and environmental safety when purchasing products. Thus, purchase intention can be predicted more accurately according to product recycling or reuse than according to environmental attitude. Sun and Wilson [45] suggested dividing attitude into general and specific attitudes; they also suggest that consumers are more affected by specific attitudes than by general attitudes.

2.4. Behavior Intention

Purchase intention is the possibility that a person performs a specific behavior [46]. Research on green products has shown that numerous variables can be applied to explain behaviors. Mostafa [47] indicated that environmental concerns and knowledge affected consumer intention to purchase green products. Kaiser and Gutscher [48] reported that more than 50% of the explanation capacity for the intention to purchase green products can be used to explain consumer purchase behaviors toward green products. These data can be used to explain consumer purchase behaviors toward green products in the Chinese and American markets [49], which are consistent with the results of a previous study [50]. In this study, purchase intention is defined as “the willingness of consumers to purchase green products.”

3. Research Model and Hypotheses

In this study, a value perspective model was proposed to elucidate how social commerce is transforming consumer engagement and influencing decision-making. Various antecedents, such as web quality, pleasure, and arousal, influence user values and predict user behaviors, including the intention to make purchase decisions and to continue using social commerce. Figure 1 illustrates the model.

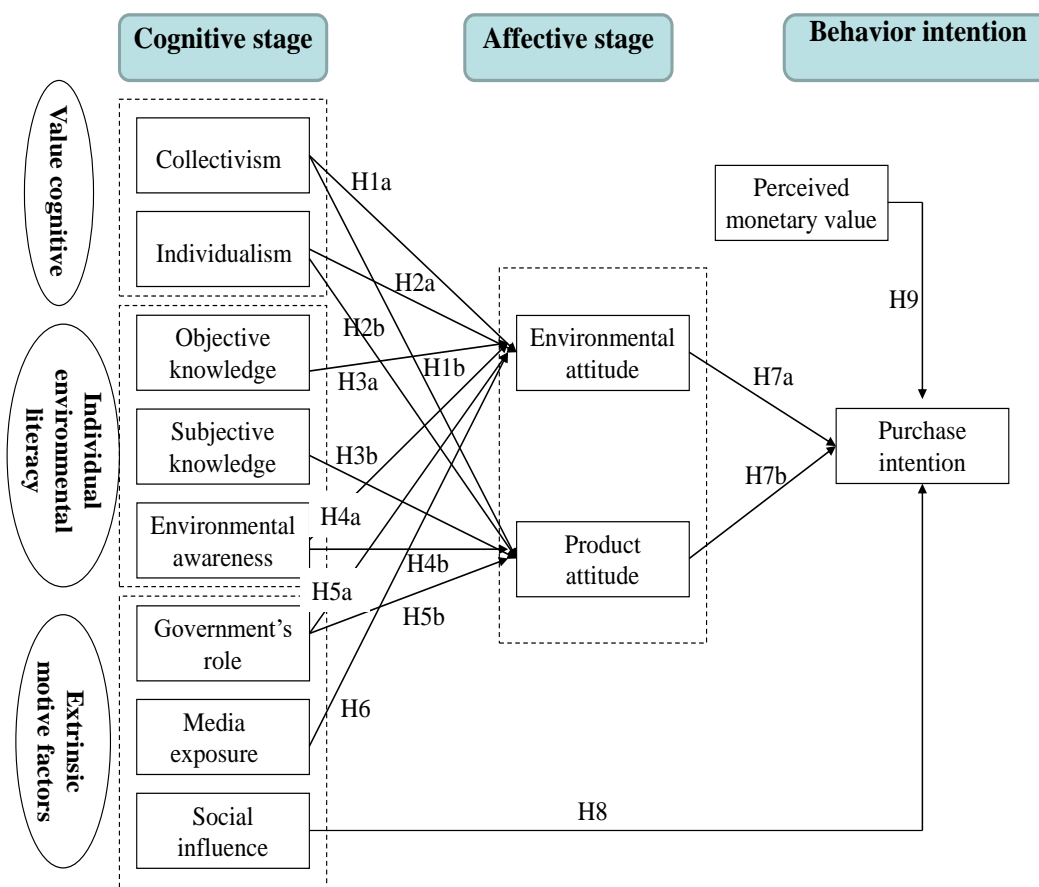


Figure 1. Research Concept from the Choice Behavior Model.

3.1. Cognitive Values

Collectivists are significantly and positively related to both internal and external environmental attitudes [24]. Collectivists with positive internal environmental attitudes believe that the environmental damage caused by product materials and manufacturing processes should be minimized; thus, they positively evaluate green products [7]. In contrast, among collectivists, positive external environmental attitudes indicate care for the environment; thus, collectivists pay attention to the environmental advantages of and policies regarding green products. Collectivists positively evaluate green products if the products facilitate environmental protection [51]. Collectivists typically demonstrate positive environmental attitudes [6,23]. In this study, collectivism was suggested to positively influence the environmental and product attitudes of consumers. Vikan et al. [37] reported that individualism negatively affects environmental attitudes. Ramayah et al. [23] suggested that individualists show positive product attitudes but negative environmental attitudes. In addition, Cheah and Phau [6] stated that individualists demonstrate significantly negative environmental attitudes. Thus, this study suggested that individualists demonstrate negative environmental attitudes but positive product attitudes.

H1a: Collectivism positively affects environmental attitudes.

H1b: Collectivism positively affects product attitudes.

H2a: Individualism negatively affects environmental attitudes.

H2b: Individualism positively affects product attitudes.

3.2. Individual Environmental Literacy

Objective knowledge affects consumers' environmental attitudes, whereas subjective knowledge does not [19]. Polonsky et al. [52] reported that objective knowledge positively affects consumer environmental attitudes. Paladino and Ng [16] suggested that subjective knowledge positively affects product attitudes (e.g., a green mobile phone), whereas objective knowledge yields no effects. Therefore, this study suggested that both objective and subjective knowledge positively affect consumer environmental and product attitudes. The level of consumer environmental awareness is proportional to their positive environmental attitude; a high level generates behavioral intention to focus on environmental concerns [53]. The level of consumer concern regarding social and environmental topics is proportional to positive social and environmental attitudes [16]. Assarut and Srisuphaolarn [30] suggested that consumer environmental awareness positively affects product attitude. This study hypothesized that environmental awareness positively affects consumer environmental and product attitudes.

H3a: Objective knowledge positively affects environmental attitudes.

H3b: Subjective knowledge positively affects product attitudes.

H4a: Environmental awareness positively affects environmental attitudes.

H4b: Environmental awareness positively affects product attitudes.

3.3. Extrinsic Motivating Attributes

Connell [54] indicated that governmental policies are key predictors of environmental attitude; thus, environmental legislation affects consumer environmental attitudes [55]. In addition, studies have reported that the role of the government in environmental protection positively affects consumer attitudes toward green or other specific products [39]. This study hypothesized that the role of the government positively affects consumer environmental and product attitudes. Holbert et al. [56] reported that specific media content (e.g., TV advertisements) positively influences environmental attitudes among consumers. Wray et al. [57] indicated that media exposure positively affects consumers' environmental attitudes and behaviors. Good [58] suggested that environmental reports by the media

positively influence environmental attitudes. This study hypothesized that media exposure positively affects consumer environmental attitudes.

H5a: The role of the government positively affects environmental attitudes.

H5b: The role of the government positively affects product attitudes.

H6: Media exposure positively affects environmental attitudes.

3.4. Environmental and Product Attitudes and Purchase Intention

Mostafa [47] suggested that consumer environmental attitudes affect purchase intention, which is in line with research by Rashid [59]. In a study of green fabric, Diego et al. [10] determined that consumer product attitudes affect purchase intention. In India, the attitudes of women toward organic foods affect their purchase intention based on the theory of reasoned action [45]. Paladino and Ng [16] demonstrated that the product attitudes of college students positively affect their intention to purchase green mobile phones. Therefore, this study hypothesized that purchase intention is positively affected by both consumer environmental and product attitudes.

H7a: Environmental attitude positively affects purchase intention.

H7b: Product attitude positively affects purchase intention.

3.5. Social Influence, Perceived Monetary Value, and Purchase Intention

Prior studies have indicated that social influences positively affect the intention to purchase green products [18,37,60]. Therefore, this study hypothesized that social influences positively affect purchase intention. Hong and Tam [61] suggested that perceived monetary value affects user behavioral intentions regarding mobile information services. When consumers perceive that the price of a green product is warranted, their willingness to buy green products increases [62]. Lin and Huang [36] determined that consumers are willing to pay increased prices to purchase green products when they believe that the products are worthwhile. Thus, this study hypothesized that perceived monetary value positively affects purchase intention.

H8: Social influences positively affect purchase intention.

H9: Perceived monetary value positively affects purchase intention.

4. Analysis

B&RI countries have made a change in the consumer market of the whole world. It developed from over 80% of worldwide consumers in developed countries that are changing direction towards emerging market patterns. The strength of consumers in emerging markets is estimated at around over 3 billion USD. It is an important issue to protect the earth's environment by selling green products in B&RI countries. This study distributed questionnaires to consumers who had previously purchased green products at the green appliance division of department stores, and collected 227 valid questionnaires in B&RI countries (Vietnam, Filipines, China, Pakistan, etc.). An onsite survey of consumers in the department stores used purposive sampling, yielding 227 usable questionnaires that underwent frequency analysis. As for demographic characteristics, 42.3% of the respondents were men, and 57.7% were women, indicating that there were more female than male respondents. Thus, proportionally more women purchased green products. Regarding age, most respondents (82%) were aged 21–30 (28.2%), 31–40 (26.0%), or 51 (27.8%) years old, indicating that people of these ages constituted the major populations purchasing green appliances. In order of decreasing popularity, most consumers purchased green air conditioners (66.1%), refrigerators (63.4%), and washing machines (44.1%). Thus, 92.5% of the respondents recognized the importance of the environmental protection label. This finding was consistent with the results of a previous study [17]. The primary factor affecting purchase intention (68.3% of respondents) was water or electrical savings; the secondary factor was

environmental protection (32.7% respondents). However, 59.8% of the respondents lacked sufficient recognition and knowledge of green products.

Reliability analyses are conducted to examine the stability and consistency of various dimensions and items (Appendix ??). A high reliability value indicates a correspondingly high level of stability. This study conducted a partial least squares regression, which yields a component reliability (CR) value greater than 0.7 and a loading factor greater than 0.5 [63] to indicate sufficient reliability. The analyses indicated that the reliability and stability of the study were sufficient (Table 1). As for the validity analysis, the average variance extracted (AVE) for each dimension should exceed 0.5, indicating sufficient convergent validity for an item in each dimension. The square root of the AVE should surpass the correlation coefficients of the dimensions to indicate sufficient discriminant validity among each dimension.

Table 1. Reliability and Validity.

Attributes	Item	CR	AVE	Col	Ind	OK	SK	EAw	Gov	Med	SI	PMV	EA	PA	PI
Col	4	0.86	0.61	0.78											
Ind	3	0.84	0.63	0.72	0.79										
OK	5	0.89	0.61	0.60	0.60	0.78									
SK	3	0.87	0.70	0.69	0.74	0.71	0.84								
EAw	4	0.85	0.59	0.57	0.61	0.55	0.69	0.77							
Gov	5	0.89	0.63	0.31	0.40	0.39	0.48	0.61	0.79						
Med	3	0.88	0.72	0.26	0.18	0.29	0.29	0.08	0.18	0.85					
SI	4	0.89	0.68	0.49	0.43	0.44	0.44	0.29	0.21	0.45	0.82				
PMV	3	0.84	0.64	0.38	0.41	0.39	0.48	0.40	0.35	0.29	0.46	0.80			
EA	5	0.92	0.70	0.44	0.45	0.45	0.57	0.72	0.70	0.18	0.22	0.40	0.84		
PA	6	0.92	0.65	0.61	0.66	0.55	0.73	0.70	0.55	0.17	0.45	0.52	0.62	0.81	
PI	5	0.94	0.76	0.54	0.58	0.54	0.69	0.63	0.52	0.28	0.51	0.63	0.57	0.74	0.87

Note: Diagonal elements in the “correlation of constructs” matrix are the square root of the average variance extracted. CR is the “Composite reliability”; AVE is the “Average variance extracted”; Col is “Collectivism”; Ind is “Individualism”; OK is “Objective knowledge”; SK is “Subjective knowledge”; EAw is “Environmental awareness”; Gov is “Government’s role”; Med is “Media exposure”; SI is “Social influence”; PMV is “Perceived monetary value”; EA is “Environmental attitude”; PAI is “Product attitude”; PI is “Purchase intention”.

4.1. Structural Model

This study tested the research model and hypotheses using a bootstrapping procedure to acquire the path estimates and *t* values, and a structural model was used to test the hypothesized relationships. Table 2 lists the results of the structural model test.

4.1.1. Cognitive Influences

Regarding cognitive value, collectivism significantly and positively affected environmental ($\beta = 0.075$, $t = 1.72$) and product attitudes ($\beta = 0.111$, $t = 2.59$; validating H1a and H1b); thus, collectivistic consumers pay more attention to the relationship between the product and its environmental impact than to personal benefits. Furthermore, individualism significantly and negatively affected environmental attitude ($\beta = -0.078$, $t = 1.76$; confirming H2a). Thus, individualistic consumers pay more attention to personal benefits than to the environment. Individualism significantly and positively affected product attitudes ($\beta = 0.156$, $t = 3.74$; verifying H2b). Therefore, individualistic consumers care about the advantages of using green appliances, hence enhancing their product attitudes.

Regarding individual environmental literacy, objective knowledge non-significantly affected environmental attitude ($\beta = 0.028$, $t = 0.81$). Thus, H3a was rejected. Subjective knowledge significantly and positively affected product attitude ($\beta = 0.287$, $t = 6.06$). Thus, H3b was not rejected, and knowledge regarding green appliances enhances consumer product attitudes. Environmental awareness significantly and positively affected environmental ($\beta = 0.457$, $t = 10.95$) and product attitudes ($\beta = 0.240$, $t = 5.48$; confirming H4a and H4b). Therefore, consumers focus on the long-term use of green appliances

that yield social and individual benefits and minimize environmental damage, enhancing consumer environmental attitudes.

Regarding extrinsic motivating attributes, the role of the government significantly and positively affected environmental ($\beta = 0.413, t = 9.46$) and product attitudes ($\beta = 0.169, t = 3.99$). Thus, H5a and H5b were not rejected. Regulations regarding the environment and green products can enhance consumer environmental and product attitudes, facilitating environmental protection. Furthermore, media exposure significantly and positively affected environmental attitude. Thus, H6 was not rejected, indicating that the media attracts consumer attention to environmental concerns and green products, enhancing consumer environmental attitudes.

4.1.2. The Influence of Cognitive and Affective Attributes and Behavioral Intention

The experimental results demonstrate that environmental attitude affects purchase intention ($\beta = 0.153, t = 3.92$); thus, H7a was not rejected. Product attitude significantly and positively affected purchase intention ($\beta = 0.433, t = 8.19$). Thus, H7b was not rejected, indicating that the level of consumer understanding regarding the environment and green products enhances the intention to purchase green appliances. Social influences significantly and positively affected purchase intention ($\beta = 0.433, t = 8.19$); therefore, H8 was not rejected, implying that the influences of relatives, friends, and coworkers enhance consumer intention to purchase green products. Furthermore, perceived monetary value significantly and positively affected purchase intention ($\beta = 0.433, t = 8.19$); thus, H9 was not rejected, indicating that acceptable prices can increase consumer intention to purchase green appliances.

The R^2 values of the endogenous constructs can be explained based on the explanatory power of the proposed model. The explained variance was 66% for intention to purchase, 64% for environmental attitude and 64% for product attitude. All the R^2 values exceeded the minimal value of 0.10 [11].

Table 2. Tests of Hypothesized Relationships.

Structural Path		Standardized Coefficient	t-Value	Hypothesis
Collectivism	Environmental attitude	0.075	1.72 (*)	H1a supported
Collectivism	Environmental attitude	0.111	2.59 (***)	H1b supported
Individualism	Environmental attitude	−0.078	1.76 (*)	H2a supported
Individualism	Product attitude	0.156	3.74 (***)	H2b supported
Objective knowledge	Environmental attitude	0.028	0.81	H3a unsupported
Subjective knowledge	Product attitude	0.287	6.06 (***)	H3b supported
Environmental awareness	Environmental attitude	0.457	10.95 (***)	H4a supported
Environmental awareness	Product attitude	0.24	5.48 (***)	H4b supported
Government's role	Environmental attitude	0.413	9.46 (***)	H5a supported
Government's role	Product attitude	0.169	3.99 (***)	H5b supported
Media exposure	Environmental attitude	0.053	1.66 (*)	H6 supported
Environmental attitude	Purchase intention	0.153	3.92 (***)	H7a supported
Environmental attitude	Purchase intention	0.433	8.19 (***)	H7b supported
Social influence	Purchase intention	0.166	5.94 (***)	H8 supported
Perceived monetary value	Purchase intention	0.263	6.92 (***)	H9 supported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; R^2 of environmental attitude = 0.64; R^2 of product attitude = 0.64; R^2 of purchase intention = 0.66.

4.2. Effect Analysis

In our research, the causal relationship between various dimensions can be divided into “direct effects” and “indirect effects.” The direct effects refer to the direct, one-way influence without intervening variables. Conversely, the indirect effects refer to the influence that *predictor* variables exert on criterion variables. For indirect effects to occur, one or more intervening variables must be present, and the intensity of their effect is the value obtained by multiplying the direct effect path coefficients. In addition, the sum of the direct and indirect effects is called the total effect. The total effect obtained through path analysis indicated that the *intensity of the relationship between each dependent variable and independent variable* was weak. Table 3 lists the results of this study, which are explained below.

4.2.1. Direct Effects

- (A) The independent *variables that influenced environmental attitudes were* “collectivism,” “individualism,” “objective knowledge,” “environmental awareness,” “the role of the government,” and “media exposure.” Of these six variables, environmental awareness exerted the greatest effect. The intensity of the direct effects of these six variables was 0.075, −0.078, 0.028, 0.457, 0.413, and 0.053. Thus, for each additional unit of “collectivism,” “individualism,” “objective knowledge,” “environmental awareness,” “the role of the government,” and “media exposure,” the average intensity of environmental attitudes increased by 0.075, −0.078, 0.028, 0.457, 0.413, and 0.053, respectively.
- (B) The independent *variables that influenced product attitudes were* “collectivism,” “individualism,” “subjective knowledge,” “environmental awareness,” and “the role of the government.” Of these five variables, subjective knowledge exerted the greatest effect. The intensity of the direct effects of these five variables was 0.111, 0.156, 0.287, 0.240, and 0.169, respectively. Thus, for each additional unit of “collectivism,” “individualism,” “subjective knowledge,” “environmental awareness,” and “the role of the government,” the average intensity of product attitudes increased by 0.111, 0.156, 0.287, 0.240, and 0.169, respectively.
- (C) The independent *variables that influenced purchase intentions were* “social effects,” “perceived value of currency,” “environmental attitudes,” and “product attitudes.” Of these four variables, product attitudes exerted the greatest effect. The intensity of the direct effects of these four variables was 0.166, 0.263, 0.153, and 0.433, respectively. Thus, for each additional unit of “social effects,” “perceived value of currency,” “environmental attitudes,” and “product attitudes,” the average intensity of purchase intentions increased by 0.166, 0.263, 0.153, and 0.433, respectively.

4.2.2. Total Effects

The independent *variables that influenced environmental attitudes were* “collectivism,” “individualism,” “objective knowledge,” “environmental awareness,” “the role of the government,” and “media exposure.” Of these six variables, environmental consciousness exerted the greatest effect. The intensity of the total effects of these six variables was 0.075, −0.078, 0.028, 0.457, 0.413, and 0.053, respectively. Thus, for each additional unit of “collectivism,” “individualism,” “objective knowledge,” “environmental awareness,” “the role of the government,” and “media exposure,” the average intensity of environmental attitudes increased by 0.075, −0.078, 0.028, 0.457, 0.413, and 0.053, respectively, with environmental awareness exerting the most substantial effect.

- (A) The independent *variables that influenced product attitudes were* “collectivism,” “individualism,” “subjective knowledge,” “environmental awareness,” and “the role of the government.” Of these five variables, subjective knowledge exerted the greatest effect. The intensity of the total effects of these five variables was 0.111, 0.156, 0.287, 0.240, and 0.169, respectively. Thus, for each additional unit of “collectivism,” “individualism,” “subjective knowledge,” “environmental consciousness,” and “the role of the government,” the average intensity of product attitudes increased by 0.111, 0.156, 0.287, 0.240, and 0.169, respectively. Subjective awareness exerted the most substantial effect.
- (B) The independent *variables that influenced purchase intentions were* “collectivism,” “individualism,” “objective knowledge,” “subjective knowledge,” “environmental awareness,” “the role of the government,” “media exposure,” “social effects,” “perceived value of currency,” “environmental attitudes,” and “product attitudes.” Of these 11 variables, product attitudes exerted the greatest effect. The intensity of the total effects of these 11 variables was 0.0595, 0.0556, 0.0043, 0.1243, 0.1738, 0.1364, 0.0081, 0.166, 0.263, 0.153, and 0.433, respectively. Thus, for each additional unit of “collectivism,” “individualism,” “objective knowledge,” “subjective knowledge,” “environmental awareness,” “the role of the government,” “media exposure,” “social effects,” “perceived value of currency,” “environmental attitudes,” and “product attitudes,” the average intensity of purchase

intentions increased by 0.0595, 0.0556, 0.0043, 0.1243, 0.1738, 0.1364, 0.0081, 0.166, 0.263, 0.153, and 0.433, respectively. Product attitudes exerted the most substantial effect.

Based on the causal relationships of purchase intentions described above, users' environmental attitudes were affected by their environmental awareness. The results of this study are consistent with those reported by Diamantopoulos et al. [53] and Chen and Chai [64]. Specifically, the more consumers care about the quality of the environment, pay attention to social well-being, and desire to protect the environment, the more favorable attitudes they have toward society and the environment. This provides them with an incentive to participate in environmentally responsible behaviors. Furthermore, the users' product attitudes were affected by their subjective knowledge. These results were consistent with those reported by Barber et al. [19]. Specifically, the higher the consumer awareness of green home appliances, such as knowing that green home appliances with a green mark save energy, the greater their preference for green home appliances will be. In addition, users' purchase intentions are affected by their product attitudes. The results obtained in this study are consistent with those reported by Leonidou et al. [24] and Paladino and Serena [16]. Specifically, the higher the consumer evaluation of green home appliances (e.g., green home appliances can save energy and possess increased durability), the greater their intentions to purchase green home appliances will be.

Table 3. Effect Analysis.

Independent Variable		Dependent Variable		
		Environmental Attitudes	Product Attitudes	Purchase Intentions
Collectivism	Direct effects	0.075	0.111	-
	Indirect effects	-	-	0.0595
	Total effects	0.075	0.111	0.0595
Individualism	Direct effects	-0.078	0.156	-
	Indirect effects	-	-	0.0556
	Total effects	-0.078	0.156	0.0556
Objective knowledge	Direct effects	0.028	-	-
	Indirect effects	-	-	0.0043
	Total effects	0.028	-	0.0043
Subjective knowledge	Direct effects	-	0.287	-
	Indirect effects	-	-	0.1243
	Total effects	-	0.287	0.1243
Environmental awareness	Direct effects	0.457	0.240	-
	Indirect effects	-	-	0.1738
	Total effects	0.457	0.240	0.1738
Role of the government	Direct effects	0.413	0.169	-
	Indirect effects	-	-	0.1364
	Total effects	0.413	0.169	0.1364
Media exposure	Direct effects	0.053	-	-
	Indirect effects	-	-	0.0081
	Total effects	0.053	-	0.0081
Social influence	Direct effects	-	-	0.166
	Indirect effects	-	-	-
	Total effects	-	-	0.166
Perceived value of currency	Direct effects	-	-	0.263
	Indirect effects	-	-	-
	Total effects	-	-	0.263
Environmental attitudes	Direct effects	-	-	0.153
	Indirect effects	-	-	-
	Total effects	-	-	0.153
Product attitudes	Direct effects	-	-	0.433
	Indirect effects	-	-	-
	Total effects	-	-	0.433

5. Conclusions and Discussion

The values (collectivism and individualism) proposed by Follows and Jobber [65] were applied in a green appliance context. The results agree with those of Ramayah et al. [23] regarding consumer intention to purchase green products, demonstrating the influence of collectivism and individualism on environmental and product attitudes.

In addition, this study verified the results of Paladino and Ng [16], indicating that consumer knowledge affected consumer attitudes toward purchasing green mobile phones. In their study of green products, Chen and Chai [64] indicated that consumers who possessed a strong environmental awareness greatly recognized the value of environmental protection and preferred green products.

In terms of cognitive values, collectivism and individualism both affect consumer intention to purchase green appliances through the pathways of environmental and product attitudes. This indicates that the level of concern regarding the environment affects consumer evaluations of environmental effects and preferences for green products, influencing purchase intention [27].

5.1. Theorem Implication

Based on the choice behavior model [20] and observations in various studies [16,23,31,58], this study investigated cognitive influence (cognitive values, individual environmental literacy, extrinsic motivating forces, social influence, and perceived monetary value), affective influence (environmental and product attitudes), and behavioral intention (purchase intention). The following academic contributions were obtained:

- (a) The findings confirmed that the choice behavior model proposed by Sheppard et al. [20] indicates that both cognitive and affective attributes influence consumer intention to purchase green appliances.
- (b) Sun and Wilson [45] indicated that there are two attitudes in the context of a green appliance purchase: general (environmental attitude) and target-specific attitudes (product attitude). This study demonstrated that target-specific attitudes more strongly affected consumer intention to purchase than did general attitudes.
- (c) The findings confirmed the results of Good [58] and Chen and Chai [64], who showed that media exposure affected environmental attitudes and that the role of the government affected environmental and product attitudes. Moreover, media exposure improved consumer awareness, affected consumer feelings, and enhanced consumer intention to purchase green appliances. This study verified how social influence [13] and perceived monetary value [66] affect purchase intention. Therefore, extrinsic motivating forces (i.e., the role of the government, media exposure, and social influence) and perceived monetary value can affect consumers; when consumers recognize the cognitive value of environmental protection, their preference for green products is increased, and their intention to purchase green appliances is enhanced.
- (d) The findings indicated that objective knowledge exerted a non-significant influence. These results are in line with previous findings [36]. Objective knowledge did not significantly affect environmental attitude. However, these results do not indicate that objective knowledge is unsuitable for investigating consumer intention to purchase other green products. Further investigation is needed to determine how objective knowledge affects green product purchase intention.

5.2. Managerial Implication

This study investigated the attributes (cognitive value, individual environmental literacy, extrinsic motivating attributes, social influences, perceived monetary value, environmental and product attitudes) that affect consumer intention to purchase green appliances.

Businesses can use the media to emphasize the added value of their products (e.g., energy savings; or to reduce, reuse and recycle emissions) to consumers. This can increase the cognitive value of consumers regarding environmental protection and product preference, yielding increased

purchase intention. Governmental organizations can raise consumer cognition of environmental protection by promulgating activities or videos. Increasing consumer consciousness regarding the environmental benefits of green appliances and products can yield increased purchase intention toward such products. Regarding individual literacy, environmental awareness affects consumer intention to purchase green appliances based on environmental attitudes. Furthermore, subjective knowledge and environmental awareness affect consumer intention to purchase green appliances based on product attitude. Consumers who are knowledgeable about green products believe that purchasing green products benefits the environment for sustainable consumption; thus, environmental awareness affects consumer evaluations of environmental benefits and their preference for green products, which positively affects purchase intention [39]. Therefore, businesses should provide product and environmental information on their websites or via mobile software; this can enhance consumer understanding of green appliances and yield preferred evaluations of products that generate environmental benefits and increase purchase intention.

Pointed out in Tikka et al. [67], although positive objective knowledge and enthusiastic environmental awareness are interdependent, they often receive influence from personal ethics and mind states that may lead to a less personal awareness towards one's environment. It's obvious that environmental awareness is connected with personal attitude and value, not objective knowledge. This implies that an increase on studies about causes of environmental problems and a more abundant source of information about sustainable marketing policies for green products to future consumers [32] will increase the levels of environmental awareness within consumers.

In terms of extrinsic motivating attributes, the role of the government and media exposure affect consumer intention to purchase green appliances based on environmental and product attitudes [68]. Product discounts or compensations from governmental organizations or businesses, as well as social influences, such as recommendations by relatives or friends and media advertisements sponsored by reputable, environmentally oriented parties, can increase consumer intention to purchase green appliances. The duty of the government to facilitate environmental protection, and environment-related advertising in the media, can affect consumer evaluations of environmental benefits and their preferences for green products, thus enhancing consumer intention to purchase green products.

In addition to providing compensation, governmental organizations can increase consumer intention to purchase green appliances by educating consumers about environmental protection, sponsoring environment-related media advertisements, and conducting activities associated with environmental protection. These activities would enable consumers to understand the specifications of green appliances [12].

Governmental organizations must promote in-school education programs and promulgate green policies and environmental protection. In addition, concerns regarding global warming and the destruction of natural habitats can be advertised in the media, enabling consumers to understand the importance of environmental protection and green consumption [69]. Raising awareness of environmental issues and obtaining consumer preferences for purchasing green products yields an increased purchase intention.

Social influences and perceived monetary values significantly affect consumer intention to purchase green appliances. Thus, relatives, friends, and perceived monetary value play key roles in affecting the intention to purchase green products [70]. Regarding monetary value, businesses must emphasize the quality and functions of green products; thus, when consumers purchase green products, they are aware of their environmental benefits and energy savings in addition to their functions as products.

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Appendix

Table A1. research questionnaire.

Aspect	Questions	Strongly Agree	Agree	Normal	Disagree	Strongly Disagree
Collectivism	I think I'm a person who attaches important to environmental protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Even if green products are more expensive, I will still purchase green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I will share with others the benefits of green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think purchase green products can reduce the environmental pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individualism	I think purchase green product is a respect for the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The purchase of green products is a manifestation of self-realization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I will buy green products if necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Objective knowledge	I know what a green product is.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I understand that non-green products affect the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I know what an environmental label is.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I understand the concept of green energy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I know that using the green product reduce the damage to the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subjective knowledge	I know it's environmentally responsible to purchase green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I know that using green appliances is one way to protect the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I know the green products I bought are environmentally friendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental awareness	I think there should be more retail stores selling green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think I have a responsibility to protect the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think environmental problems will affect human life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the environment is getting worse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The role of the government	I think the government should help recycle discarded appliances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the government is responsible for promoting regulations of environmental protection against certain appliances.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the government should enforce the control of environmental pollution and waste from green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the government should take more responsibility for environmental protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the government should request consumers to learn knowledge about environmental protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Media exposure	I often read advertisements or propaganda on green products in the newspaper.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I often see messages of green appliances on TV.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I often hear messages of green appliances on the radio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table A1. Cont.

Aspect	Questions	Strongly Agree	Agree	Normal	Disagree	Strongly Disagree
Social influences	I learn from my friends, family and classmates about green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If my friends purchase green products, I will buy them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I will share information to buy green products with my friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Most of my friends and family buy green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Perceived monetary value	The price of green products are economical.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the price of green products are in line with the value of the product.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The price of green products are acceptable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental attitude	Advocating an environmentally lifestyle is necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the government needs to focus more on environmental protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	It is very important to promote consumers' attention to environmental issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think it's important to control environmental pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think the earth's resources are limited, so environmental protection is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product attitude	I prefer using green products over non-green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think purchasing green products is good for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Green products can save energy and electricity and this is important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I think green products that can reduce environmental damage are important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I am willing to purchase green products that are good for the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Recyclable green products are good.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Purchase Intention	In the future, I will buy green products with less environmental pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I plan to buy green products in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I would advise others to buy and use green products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I will buy green products in accordance with government advice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	I am very likely to buy green products in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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