The Positive Impact of Environmental Friendliness on Green Purchase Intentions

Yu-Shan Chen, Pi-Yu Lai, Tai-Wei Chang, Tsu-Ti Yen

Department of Business Administration, National Taipei University, New Taipei City, Taiwan

Abstract--**The major purpose of this paper is to explore the positive impact of environmental friendliness on green purchase intentions and also to discuss the mediation effects of green perceived value and green loyalty. This study undertakes an empirical study by means of questionnaire survey. The respondents are consumers who have purchase experience of green products. This study applies structural equation modeling (SEM) to test the hypotheses. The empirical results show that: (1) environmental friendliness has a significant positive impact on green perceived value, green loyalty, and green purchase intentions; (2) both of green perceived value and green loyalty positively affect green purchase intentions; and (3) green perceived value and green loyalty partially mediate the positive relationship between environmental friendliness and green purchase intentions.**

I. INTRODUCTION

The human life quality have been since 18th century middle industrial revolution, however, economic and technology of fast development cause environment excessive development, , and the serious pollution eventually stimulated environmental movements throughout the world, People became increasingly conscious of the importance of the environment, As environmental issues are raising, world organization of environment regulations have been established, the United Nations General Assembly established the first United Nations Environment Program (UNPE) in 1972. The primary goal of the UNPE is to manage environmental movements by various United Nations agencies, develop pollution prevention measures, and protect the planet from pollution. As a result, the concept of green environmental management began to gain popularity. At the same time, businesses were motivated to take on more social responsibility and to adopt green marketing strategies as their operational philosophy by thoroughly transforming their traditional business marketing strategies [1].

Green products have less environmental impact or are less detrimental to human health than traditional products. As the green movements become more prevalent, consumers will eventually change their purchase behaviors and become more receptive to green products [2]. Today, the number of environmentally conscious consumers has grown, and customers are realizing the direct and significant impact of their purchase behaviors on the environment. Environmental issues are taken into their purchase consideration to contribute to the global environment. More consumers are willing to purchase green products even if the price of the green products is higher [3].

The development of green production and consumption is a global trend. For sustainable development of the Earth, we must strive to change traditional production and consumption practices. For several decades, with increasing green awareness, Taiwan has promoted green movements. In addition, there are more green products available in Taiwan. However, a significant number of consumers distrust green products, and are wary of the environmental functionality of a particular brand or company.

Customer perceived quality and satisfaction are reflected in customer trust and loyalty [4]. Consumers develop emotional responses to a product or service through their purchase experience, and their pleasure toward that product or service is an indication of their satisfaction [5]. Moreover, customers who are more satisfied with a product are more willing to establish a long-term relationship with the seller [6]. Literature on marketing has shown that satisfaction is an antecedent of trust. In addition, cognitive perception of product quality is an attribute of product or brand perception, but consumers often lack sufficient information about the sellers. Therefore, how to create customer trust toward a product or brand is a pressing market issue [7]. When customer satisfaction toward a product or service is greater than customer expectation, the customer might continue purchasing the product and recommend the product to others [8].

Based on the above research background and motivation, this study examines how the degree of environmental friendliness of green products, green perceived value, and green loyalty impact green purchase intentions. The research objectives are listed as follows:

1) Exploring the impact of environmental friendliness on green perceived value, green loyalty and green purchase intentions.
2) Discussing the impacts of green loyalty and green perceived value on green purchase intentions.
3) Investigating whether green loyalty and green perceived value mediate the relationship between environmental friendliness and green purchase intentions.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Owing to the increasing prevalence of green marketing issues, more customers have gradually become consumer advocates of a green lifestyle willing to pay higher prices to purchase green products that reduce environmental harm [9]. Most of the past literature on environmental friendliness focused on environmentally friendly behavior (EFB), as well as green materials and technology [10].

A. Environmentally Friendly Behavior (EFB)

Environmentally friendly behavior stems from consumers' environmental concerns and feelings elicited by green issues [11]. According to Zimmer et al. [11], environmental concern attitude, personal norms and injunctive norms significantly affect EFB. Of these factors, personal norms have a greater impact than injunctive norms, indicating that when consumers have an inner sense of "should" toward a green issue, their actions often conform to norms that are perceived as consistent with their personal norms. Injunctive norms have a greater impact than environmental concern attitude, thereby indicating that personal feelings arising from social pressure can better motivate EPB in consumers than feelings elicited by green issues [12].

Consumer EFB include buying behaviors such as: reading labels, using biodegradable trash bags and cleaning supplies, buying reusable packaging materials, recycling products and donating to environmental groups. From the perspective of intent and behavior, scholars define consumer EFB as a subset of altruistic or pro-social behaviors [13]. Past research has established consumers' willingness to pay more for environmentally friendly products and services [14]. The intentions to engage in environmentally friendly behavior (EFB) have been discussed in prior literature. The most popular intentions include: "intentions to visit/choose environmental friendly services", "willingness to pay more for environmentally friendly products or services", "commitment to environmentally friendly services", and "word of mouth of environmentally friendly communications" [10]. Previous literature uses values as factors determining environmentally friendly behavior (EFB) on the application of the altruistic behavior concept [15]. Many prior studies apply personal norms, feelings of moral obligation, and altruism to explore behaviors related to energy saving [16], recycling [17], and taking action in environment protection [18].

B. The influence of environmental friendliness on green perceived value

Nowadays, consumers pay more attention to environmentally friendly paint (also known as green paint), either sewage purification paint or air purification paint. Catalysts and composite materials will be integrated with paint technology helping to achieve the environmental friendliness [20]. Green labels, such as those with the current energy-rating label, can help bridge the gap between green consumers' values and behaviors [21].

Perceived value is a consumer's overall evaluation of the net benefit of a product or service based on a consumer's appraisal of what is received and what is given [56;57] . Based on the definition above, this study proposed a novel notion, 'green perceived value', and referred to Chen [24] to define it as "a consumer's overall appraisal of the net benefit of a product or service between what is received and what is given based on the consumer's environmental desires, sustainable expectations, and green needs". Previous literature suggested

that there is a positive relationship between perceived value and customer satisfaction [58;59].

Due to global warming, the consumers are willing to pay more attention to the environment, and also becoming committed to buying green products [27]. Therefore, companies are eager to implement their products' environmental friendliness in their manufacturing processes so that consumers will perceive their products as having a higher level of environmental quality [28]. Green perceived quality refers to "the customer's judgment about a brand's overall environmental excellence or superiority" [25;27]. Based on a literature review, this study asserts that if green products can satisfy consumer demand for environmentally friendly behaviors (EFB), they will have a positive influence on green perceived value [24]. Therefore, this research proposes the following hypothesis.

- ***Hypothesis 1 (H_1). The degree of a product's environmental friendliness has a positive influence on its green perceived value.***

C. The influence of environmental friendliness on green loyalty

Loyalty is the extension of commitment to rebuy or to repurchase a preferred product, service, or brand consistently in the future [60]. Dick and Basu [61] define loyalty is the strength of an individual's faithfulness or devotion for a product, brand, or service and consumer's repeat purchases. According to the above definitions, a novel notion, 'green loyalty' was proposed to this study, and referred to Chen [24] to define it as "the level of repurchase intentions prompted by a strong environmental attitude and sustainable commitment towards an object, such as a product, a service, a company, a brand, a group, or so on".

This study refers to Chen [24] to define green loyalty as "the level of repurchase intentions prompted by a strong environmental attitude and sustainable commitment towards an object, such as a product, a service, a company, a brand, a group, or so on". Companies can enhance the functionality of their green products to raise their customers' green loyalty to increase the sales of their green products [24]. Therefore, this research proposes the following hypothesis.

- ***Hypothesis 2 (H2). The degree of a product's environmental friendliness has a positive influence on its green loyalty.***

D. The influence of environmental friendliness on green purchase intentions

If consumers question the environmental friendliness of a product, they will also doubt the environmental reliability, effectiveness, and capability of the product, and question its trustworthiness [29,31]. If firms actively engage in green initiatives and successfully communicate their environmental efforts with consumers, the consumers may believe their green advertisements [25,30,31]. Green purchase intention refers to "the likelihood that a consumer would buy a particular brand, product, or service resulting from his or her

environmental needs" [29]. In the environmental era, this study claims that green purchase is positively affected by the degree of environmental friendliness of the product. Therefore, this research proposes the following hypothesis:

- *Hypothesis 3 (H3). The degree of a product's environmental friendliness has a positive influence on its green purchase intentions.*

E. The influence of green perceived value on green purchase intentions

Consumer judgment normally base on incomplete information, perceived value of products which are acted as a signal to them would positively influence their purchase intentions [7]. Perceived value is a set of attributes which are related to the perception of a product's value, so it can build up a positive word-of-mouth effect and raise purchase intentions [44]. Since some companies promote their products by means of deceptive claims about the environmental value of their products, customers are averse to purchase their products [62]. Meanwhile, currently green perceived value plays a more important role in the environmental era. Perceived value is one of the most significant factors affecting purchase intentions [42]. Therefore, previous literature indicates that perceived value is positively related to consumer purchase intentions. Poor perceived value can result in loss of consumer purchase intentions [44]. If consumers perceive that the value of a product is higher, they are more likely to purchase the product. Thus, prior literature demonstrates that perceived value of customers positively impact their purchase intentions [57,58,63,64,65]. In the rise of the environmentalism nowadays, green perceived value is very crucial to green purchase intentions, so this study implies the following hypothesis:

- *Hypothesis 4 (H4). A product's green perceived value has a positive influence on its green purchase intentions.*

F. The influence of green loyalty on green purchase intentions

Previous study posited that the satisfaction-loyalty relationship is positive [66]. Customer satisfaction has an important role as the antecedent of customer loyalty [60]. Customers first develop their loyalty toward a brand, product, or service in the cognitive sense, then later in affective sense, and still later in a cognitive or behavioral manner [60]. Affective loyalty is based on quality-based satisfaction or price-based satisfaction. The outcome of satisfaction is loyalty, and in turn satisfaction has a positive impact on loyalty [67]. This study hypothesized that green satisfaction of customers positively influences their green loyalty.

Consumer loyalty is an antecedent of customer purchase intention. If consumers have had a higher level of loyalty for a product, brand or service, they would demonstrate a higher level of purchase intention.

Customer loyalty is one of primary factors influencing purchase intention . Prior literatures assert that firms need to raise their customer loyalty in order to enhance their customer purchase intention. Lately some firms advertise the environmental performance of their products dishonestly, and thus customers are less likely to purchase their products again [62]. Since more firms would like to seize green opportunities in the environmental era nowadays, consumer loyalty towards environmental sustainability is more crucial. As a result, consumer loyalty towards environmental sustainability would positively influence consumer purchase intention with respect to environmental consideration [22]. Therefore, this paper asserts that green loyalty positively affects green purchase intention and proposes the following hypothesis:

- *Hypothesis 5 (H5). A product's green loyalty has a positive influence on its green purchase intentions.*

As this study asserts that environmental friendliness of a product positively affects its green perceived value, green loyalty, and green purchase intentions, it thus follows that the relationship between environmental friendliness and green purchase intentions is partially mediated by green perceived value and green loyalty. The antecedent of the research framework is environmental friendliness and consequently green purchase intentions, whereas green perceived value and green loyalty are two partial mediators. The research framework is reported in Figure 1.
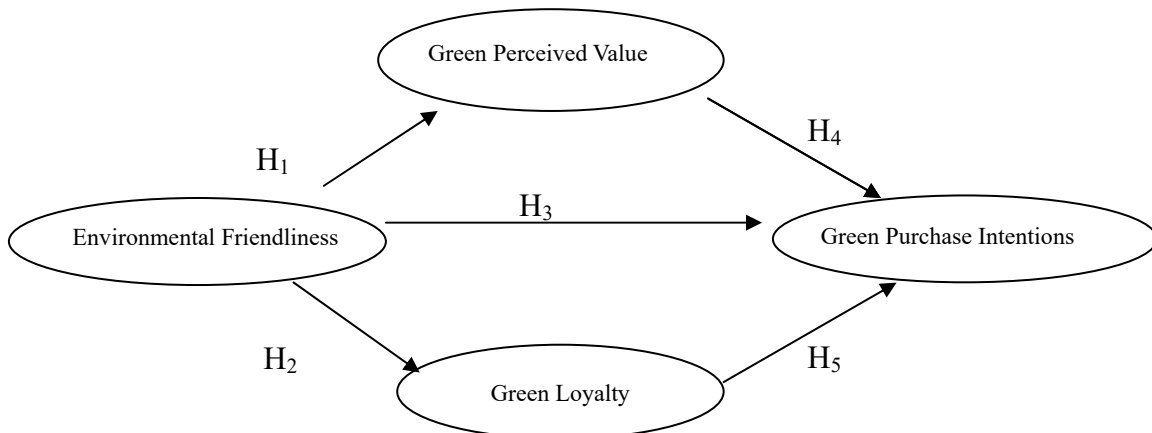

Figure 1. Research framework

III. METHODOLOGY AND MEASUREMENT

A. Data Collection and the Sample

This study tests the hypotheses and research framework by means of questionnaire survey. The unit of analysis in this study is at the consumer level. The research object of this study is Taiwanese consumers who have the purchase experience of green products in Taiwan. We randomly selected Taiwanese consumers from the *Yellow Book of Taiwan*. At first, we asked them whether they had the purchase experience of green products in the phone calls. We delete the selected consumers who had not yet purchased green products. The questionnaires were mailed to the randomly selected consumers with purchase experience of green products. The questionnaire items were originally designed in English and then translated into Chinese by two experts in the management field in Taiwan competent in both languages. To avoid cultural bias and ensure validity, the Chinese version was retranslated into English by another two experts competent in both languages in the management field in Taiwan and thoroughly examined for any misunderstandings due to translation. These back-translated questionnaire items and distinct classes of attitudes are the same as the original English ones.

Before mailing the survey to the respondents, five scholars were asked to revise the questionnaire in the first pretest. The questionnaires were then randomly mailed to ten consumers with purchase experience of green products. They were invited to answer the questionnaire. Ambiguities in meanings and terms in the second pretest were also sought out. Thus, the questionnaire of this paper possesses a necessarily high level of content validity. A total of 1500 questionnaires were sent to the randomly sampled consumers. There are 477 valid questionnaires and the effective response rate is 31.8%.

B. The Measurement of the Constructs

This study measures the questionnaire items by means of the "seven-point Likert scale from 1 to 7" rating, with choices from "strongly disagree" to "strongly agree." The definitions and measurements of the constructs in this study are described in the following:

Environmental friendliness. This study focuses on a product's environmental friendliness rather than consumers' or companies' environmental friendliness. Few studies explored the concept of a product's environmental friendliness. Past studies have examined environmentally friendly behaviors of consumers based on the purchase intention of green products to satisfy environmental pressure or fulfill personal green expectation [11]. Moreover, the assessment for environmental friendliness of products includes low pollution and non-environmental destruction during their life cycle. Therefore, the operational definition of environmental friendliness of a product is the "consumers' belief that the performance of environmental features of a product can reduce environmental impact." This study referred to Chen et al. [26] to measure Environmental friendliness: (1) You believe that this product is environmentally friendly; (2)

You believe that using this product can reduce environmental impact; (3) Compared to other similar products, this product is more environmentally friendly.

Green perceived value. This study referred to Chen [24] to measure green perceived value. The measurement of green perceived value includes six items: (1) You think that it is a right decision to purchase this product because of its environmental functionality; (2) Overall, you are happy to purchase this product because it is environmentally friendly; (3) From an environmental effectiveness perspective, buying that product is the right decision; (4) Overall, you are satisfied with this product because of its environmental performance.

Green loyalty. This study referred to Chen [24] to measure green loyalty. The measurement of green loyalty includes four items: (1) You intend to continue buying this product because it is environmental friendly; (2) You prefer purchasing this product to other products because of its environmental performance; (3) You seldom consider switching to other products because of this product's environmental concern; (4) You are willing to repurchase this product because of its environmental functions

Green purchase intentions. This study refers to Chen and Chang [29] to define 'green purchase intentions' as "the likelihood that a consumer would buy a particular product resulting from his or her environmental needs". Besides, this paper refers to Chen and Chang [29] to measure green purchase intentions and their measurement includes three items: (1) You intend to purchase this product because of its environmental concern; (2) You expect to purchase this product in the future because of its environmental performance; (3) Overall, you are glad to purchase this product because it is environmental friendly.

IV. EMPIRICAL RESULTS

Structural equation modeling (SEM) commonly refers to a combination of two things: a "measurement model" that defines latent variables using several observed variables, and a "structural model" that connects latent variables according to research models. SEM is widely used in the social sciences due to its ability to isolate observational error from measurement of latent variables. We uses questionnaire survey to measure the four constructs, environmental friendliness, green perceived value, green loyalty, and green purchase intentions, which are latent variables. That is why this study uses SEM to verify the hypotheses. This study used the AMOS 21.0 software to analyze structural equation modeling (SEM) to estimate parameters, test the fit of the model, and verify the hypotheses. SEM of this study examines the two levels of analysis, the measurement model and the structure model, and their results are shown in the following. This study uses the method of maximum likelihood estimation (MLE) in the SEM model.

A. The Results of the Measurement Model

This study shows the descriptive statistics of the questionnaire items in Table 1. This reliability and validity in

the study are evaluated. As shown in Table 2, the Cronbach's α coefficient for each construct is more than 0.85. Because the Cronbach's α coefficients of all constructs are more than 0.7, the measurement of this study is acceptable in reliability [52].

This study used average variation extraction (AVE) to test the convergent validity and discriminant validity of the measurement. Average variation extraction (AVE) calculates how well observed questionnaire items of a construct explain the average variation of the construct [53]. As shown in Table 2, the AVEs of the four constructs are respectively 0.69, 0.56, 0.59 and 0.85. Since the AVEs of the four constructs are more than 0.5, it indicates that the convergent validity of the measurement is acceptable [53].

To meet the requirement of the discriminant validity, the square root of a construct's AVE must be higher than the correlations between the construct and the other ones in the study [53]. As shown in Table 3, the diagonal elements are the square root values of AVEs, and the other elements are Pearson correlation coefficients among the constructs. For example, the square roots of the AVEs for the two constructs, environmental friendliness and green perceived value, are 0.831 and 0.747 which are more than the correlation, 0.735, between them in Table 3. It shows that there is adequate discriminant validity between the two constructs. The square roots of all constructs' AVEs of this study are all more than the correlations among all constructs in Table 3. Thus, the discriminant validity of the measurement is acceptable.

TABLE 1. DESCRIPTIVE STATISTICS OF THE QUESTIONNAIRE ITEMS.

Constructs/Questionnaire Items	Mean	Standard Deviation
Environmental Friendliness		
EF_1 You believe that this product is environmentally friendly.	5.10	1.038
EF_2 You believe that using this product can reduce environmental impact.	5.35	1.023
EF_3 Compared to other similar products, this product is more environmentally friendly.	5.10	1.034
Green perceived value		
GPV_1 You are glad about the decision to select this product because of its environmental image.	5.15	0.999
GPV_2 You think that it is a right decision to purchase this product because of its environmental functionality.	4.95	1.017
GPV_3 Overall, you are happy to purchase this product because it is environmentally friendly.	4.95	1.080
GPV_4 From an environmental effectiveness perspective, buying that product is the right decision.	4.98	1.012
Green loyalty		
GL_1 I am willing to repurchase this product because of its (environmental) functions;	5.35	1.026
GL_2 I prefer purchasing this product to other products because of its (environmental) performance;	5.11	1.093
GL_3 I seldom consider switching to other products because of this product's (environmental) concern;	4.27	1.258
GL_4 I intend to continue buying this product because it is (environmental) friendly.	5.00	1158
Green purchase intentions		
GP_1 You intend to purchase this product because of its environmental concern;.	5.29	1.034
GP_2 You expect to purchase this product in the future because of its environmental performance;	5.27	1.021
GP_3 Overall, you are glad to purchase this product because it is environmental friendly.	5.33	1.001

TABLE 2. ITEM LOADINGS (Λ), CRONBACH'S A AND AVE (AVERAGE VARIATION EXTRACTION).

Construct	Question Item	Item Loading (λ)	Cronbach's α	AVE
Environmental Friendliness ness	EF_1	0.85	0.86	0.69
	EF_2	0.85		
	EF_3	0.79		
Green perceived value	GPV_1	0.79	0.85	0.56
	GPV_2	0.77		
	GPV_3	0.77		
	GPV_4	0.66		
Green loyalty	GL_1	0.82	0.85	0.59
	GL_2	0.83		
	GL_3	0.61		
	GL_4	0.79		
Green purchase intentions	GT_1	0.92	0.94	0.85
	GT_2	0.93		
	GT_3	0.92		

Note: *** $p < 0.01$.

TABLE 3. PEARSON CORRELATION COEFFICIENTS AND SQUARE ROOT VALUES OF AVES.

	(EF)	(GS)	(GPQ)	(GT)
Environmental Friendliness (EF)	0.8106			
Green perceived value (GPV)	0.789 ***	0.8499		
Green loyalty (GL)	0.656 ***	0.693 ***	0.7663	
Green purchase intentions (GPI)	0.740 ***	0.783 ***	0.633 ***	0.8168

Note 1: The diagonal elements are the square root values of AVEs, and the other elements are Pearson correlation coefficients among the constructs. Note 2: *** $p < 0.01$.

B. The Results of the Structural Model

The overall fit of the model is divided into absolute goodness-of-fit, relative goodness-of-fit, and parsimonious goodness-of-fit [52]. For absolute goodness-of-fit, the Chi-square value/d.f. (degree of freedom) = 2.715, which is less than 3, the goodness-of-fit index (GFI) = 0.927, which is more than 0.9, and the Root Mean Square Error (RMSE) = 0.06, which stands for satisfactory fit, represent an acceptable model fit. For relative goodness-of-fit index, the adjusted goodness-of-fit index (AGFI) = 0.900, which is more than 0.8, and the normed fit index (NFI) = 0.952, which is more than 0.9, stand for an acceptable model fit. For parsimonious goodness-of-fit, the comparative-fit index (CFI) = 0.969,

which is more than 0.9, represents an acceptable model fit. Table 4 shows the various goodness-of-fit statistics of this study. According to the results of Table 4, the overall fit of the model in this study is acceptable.

This study applies the structural model of structural equation modeling (SEM) to explore the causal relationship among constructs. Figure 2 and Table 5 show the results of structural model of this study, and the path coefficients indicate the positive effects among the constructs in the structural model. The results of the structural model demonstrate that H1, H2, H3, H4, and H5 are all supported in this study.

TABLE 4. GOODNESS-OF-FIT INDICES OF THE RESEARCH MODEL.

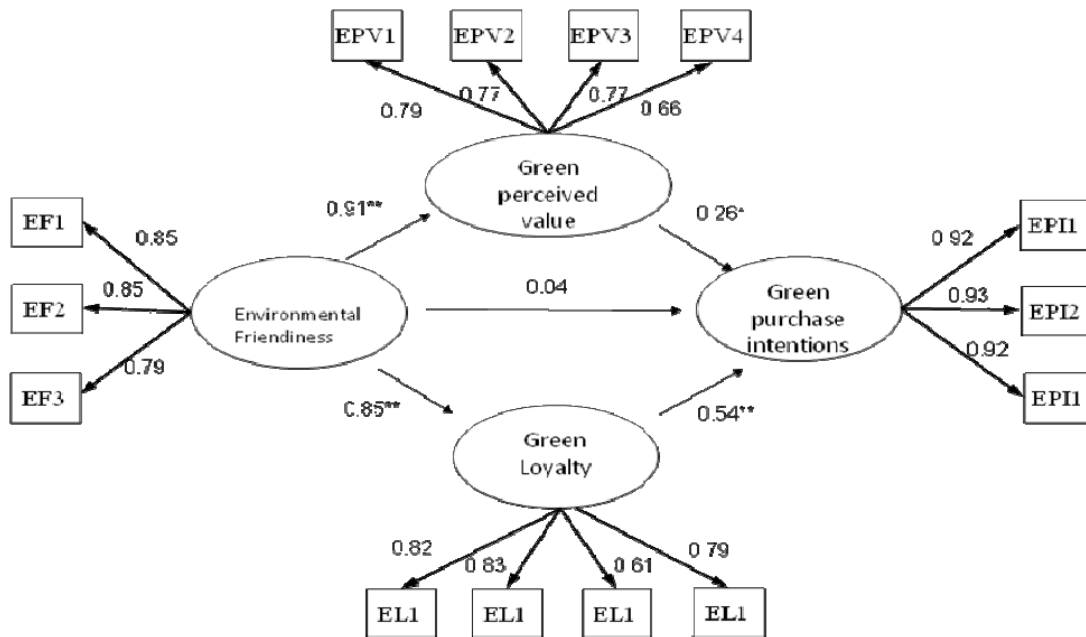|	Goodness-of-fit index	Goodness-of-fit of study model	Ideal Standard
Absolute goodness-of-fit	χ^2 (Chi-Square)	342.067	-
	d.f. (degree of freedom)	126	-
	χ^2 (Chi-Square)/df	2.715	<3 [54]
	GFI	0.927	>0.90 [54]
	RMSEA	0.06	<0.05 indicates good fit 0.05~0.08 indicates satisfactory fit [54]
Relative goodness-of-fit	AGFI	0.900	>0.8 [54]
	NFI	0.952	>0.9 [55]
Parsimonious goodness-of-fit	CFI	0.969	>0.9 [55]

Figure 2. The results of the full model. Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 5. RESULTS OF PATH ANALYSIS.

Hypothesis	Path Correlation	Standardized Path Coefficient
H_1	Environmental friendliness → Green perceived value	0.91**
H_2	Environmental friendliness → Green loyalty	0.85**
H_3	Environmental friendliness → Green purchase intentions	0.04
H_4	Green perceived value → Green purchase intentions	0.26⁺
H_5	Green loyalty → Green purchase intentions	0.54**

Note: ⁺$p < 0.1$, * $p < 0.05$, ** $p < 0.01$.

TABLE 6. DIRECT AND INDIRECT EFFECTS OF ENVIRONMENTAL FRIENDLINESS.

Direct Effect	0.04
Indirect Effects	
Green perceived value → Green purchase intentions	0.26
Green loyalty → Green purchase intentions	0.54
Total Indirect Effect	0.80

Besides the direct effect between environmental friendliness and green purchase intentions, Table 6 shows that there are two significant indirect effects between environmental friendliness and green purchase intentions. Speaking of the first indirect effect between environmental friendliness and green purchase intentions, environmental friendliness can positively affect green purchase intentions indirectly via green perceived value which accounts for the indirect effect coefficient, 0.407, in Table 6. In regards to the second indirect effect between environmental friendliness and green purchase intentions, environmental friendliness can positively affect green purchase intentions indirectly via green loyalty, which accounts for the indirect effect coefficient, 0.0879, in Table 6. Therefore, green perceived value and green loyalty have full mediation effects between environmental friendliness and green purchase intentions.

V. CONCLUSIONS AND IMPLICATIONS

Promoting the trend of green marketing, this research explores the direct and indirect influences of environmental friendliness on green purchase intentions. Empirical results support the five hypotheses.
Previous research has not addressed how to generate green purchase intentions in the context of today's popular green trend. This study therefore generates a research model to discuss the influence of environmental friendliness on green purchase intentions and to investigate the mediation effects of green perceived value and green loyalty. In other words, this study proposes the increase of environmental friendliness as a way to enhance green purchase intentions via the two mediators, green perceived value and green loyalty. The results indicate that environmental friendliness positively relates to green purchase intentions. Furthermore, this study demonstrates that green loyalty and green perceived value are two full mediators on the negative relationship between environmental friendliness and green purchase intentions. In addition, the results indicate that environmental friendliness is positively associated with green perceived value and green loyalty, which are positively associated with green purchase intentions. All hypotheses proposed in this study are supported. This study suggests that firms should increase their products' environmental friendliness to enhance their consumers' green purchase intentions. Furthermore, if companies would like to increase their customers' green purchase intentions, they have to improve their environmental friendliness, green loyalty and green perceived value.

This research points out that environmental friendliness of a product has three approaches to positively influence its green purchase intentions. The first approach is that environmental friendliness of a product can positively affect its green purchase intentions directly. The second approach is that environmental friendliness of a product can positively influence its green purchase intentions indirectly via its green perceived value. The third approach is that environmental friendliness of a product can positively affect its green purchase intentions indirectly via its green loyalty. Companies should raise environmental friendliness of their products such that green marketing could become main stream and successfully penetrate the market such that they can enhance the sales and market shares of their products. The major purpose of this study is to discuss the relationship between environmental friendliness of a product and its green purchase intentions and to investigate the partial mediation effects of green perceived value and green loyalty. Companies have to increase environmental friendliness of their products and raise green perceived value and green loyalty of their products to increase green purchase intentions of their products. It is therefore beneficial for firms to develop strategies for increasing environmental friendliness of their products and raising green loyalty and green perceived value of their products. In order to increase green purchase intentions of their products, firms should create a longer-term relationship in the environmental era. Since firms have finite resources, they should well develop their resources to enhance three positive determinants of green purchase intentions: environmental friendliness, green perceived value and green loyalty. Hence, companies should utilize every chance to raise environmental friendliness of their products and enhance green loyalty and green perceived value of their products.

There are four theoretical contributions in this paper. First, this paper combines the ideas of perceived quality and green loyalty to extend the research on green marketing and to build up green purchase intentions from the increase of environmental friendliness, green perceived value and green loyalty. Second, there is no prior research discussing the relationship between environmental friendliness and green purchase intentions. This study provide that environmental friendliness positively affects green purchase intentions through two mediators - green perceived value and green loyalty - to fill the research gap. Thirdly, this study indicates that the relationship between environmental friendliness and green purchase intentions is partially mediated by green perceived value and green loyalty. Fourthly, raising environmental friendliness, green perceived value and green loyalty can help firms to increase their customers' green purchase intentions. This research extends the research of perceived quality, satisfaction, and trust into the field of green marketing.

There are four practical contributions in this study. Firstly, this study verifies that increasing environmental friendliness of a product cannot only raise its green perceived value and green loyalty, but also enhance its green purchase intentions. If companies would like to improve their consumers' green purchase intentions for their products, they have to enhance their products' environmental friendliness, green perceived value and green loyalty. Secondly, in a more complex marketing environment, consumers play a role of an effective information channel to build up trust in the market. Thus, firms need to increase green perceived value and green loyalty in order to enhance green purchase intentions. Third, firms should raise green perceived value and green loyalty of their products. Because there are significant mediation effects of green perceived value and green loyalty in this study, companies can enhance green perceived value and green loyalty of their products to improve their green purchase intentions. Fourthly, this paper demonstrates that environmental friendliness of a product is positively associated with green perceived value and green loyalty that are positively associated with green purchase intentions. Environmental friendliness of a product does not only positively influence green purchase intentions directly, but also positively affects it via green perceived value and green loyalty indirectly.

This study explores the influence of environmental friendliness on green purchase intentions and discusses the mediation effects of green perceived value and green loyalty. Chen and Chang [30] explore the influence of "environmental friendliness" on green purchase intentions and to investigate the mediation effects of green perceived value and green loyalty. In contrast to Chen and Chang [30], who indicate that environmental friendliness is a positive determinant of green purchase intentions, this study demonstrates that environmental friendliness is a positive determinant of green purchase intentions. Chen and Chang [25] discuss the influences of green loyalty and green perceived value on green purchase intentions and investigate the mediation effect of green perceived value. Whereas Chen and Chang [25] indicate that green perceived risk is a negative determinant of green purchase intentions, this study demonstrates that environmental friendliness is a positive determinant of green purchase intentions. In addition, this study points out that green loyalty is a positive determinant of green purchase intentions, though this research proves that green loyalty is a mediator between environmental friendliness and green purchase intentions. On the other hand, this study also reveals that green perceived value positively affects green purchase intentions, a result supported by Chen and Chang [25]. Moreover, this study also demonstrates that green loyalty positively affects green purchase intentions. This result is also supported by Chen and Chang [25].

In order to increase the environmental friendliness of a product, firms should determine the sources of environmental friendliness of a product and develop them to subsequently increase green perceived value and green loyalty and further enhance green purchase intentions. In terms of future research, this study provides the following four directions. First, because this research concentrates on green products future research can examine the purchase of general products for a comparison with this study. Second, since this study is undertaken in Taiwan, future research can focus on other countries and compare to this study. Third, this study adopts an empirical research by means of a questionnaire survey that only provides cross-sectional data; future research can therefore look toward a longitudinal study to uncover the differences of environmental friendliness, green perceived value, green loyalty, and green purchase intentions in the different stages of the environmental regulations in the world. Fourth, although price is a very sensitive and contributing factor to green consumers, it is not explored in this study. We recommend that future research consider the price factor in the research model. Finally, we hope that the research findings are beneficial to researchers, managers, policy makers, and practitioners, and contribute to future research as reference.

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