

Article

The Influence of Environmental Friendliness on Green Trust: The Mediation Effects of Green Satisfaction and Green Perceived Quality

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Abstract: As global green trends became more prevalent, green marketing also developed into an important issue. Although prior literature explored the main factors affecting green trust, it was inconclusive as to how environmental friendliness could affect the green trust in green marketing. This study aims to focus on the positive influence of environmental friendliness on green trust, and explore the mediation effects of green satisfaction and green perceived quality. This study undertakes an empirical study by means of questionnaire survey. The respondents are consumers who have experience purchasing green products. This study applies structural equation modeling (SEM) to test the hypotheses. The findings of this study indicate that (1) environmental friendliness has a significant positive impact on green satisfaction, green perceived quality, and green trust; (2) both green satisfaction and green perceived quality positively affect green trust; and (3) green satisfaction and green perceived quality partially mediate the positive relationship between environmental friendliness and green trust.

Keywords: green marketing; environmental friendliness; green trust; green satisfaction; green perceived quality

1. Introduction

The impact of industrial activities on the Earth's environment intensified in the 1970s, and the serious pollution eventually stimulated environmental movements throughout the world. People became increasingly conscious of the importance of the environment, and 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].

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 satisfaction, and green perceived quality impact green trust. The research objectives are listed as follows:

- (1) Exploring the impact of environmental friendliness on green satisfaction, green perceived quality and green trust.
- (2) Discussing the impacts of green perceived quality and green satisfaction on green trust.
- (3) Investigating whether green perceived quality and green satisfaction mediate the relationship between environmental friendliness and green trust.

2. 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].

2.1. 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].

2.2. Green Materials and Technology

In recent years, the biotechnology industry has defied the law of genetics with genetic modifications, making genetic engineering a new way of being environmentally friendly [19]. In the chemical industry, solvent paints that emit volatile organic compounds into the air while drying have become a serious threat to the environment. Hence, countries are formulating environmental regulations on carbon emissions, and are committed to transforming the paint manufacturing industry. Current goals for paint include the 5Es:

- (1) Excellence of finish
- (2) Ease of application
- (3) Economics
- (4) Energy saving

(5) Environmental friendliness

Future development will emphasize environmentally friendly paint (also known as green paint), such as sewage purification paint and air purification paint. Catalysts and composite materials will be integrated with paint technology to help achieve 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].

Green satisfaction refers to “the willingness to expect environmental effectiveness from a product or service (or brand) due to the product or service being reliable, friendly and having green capability” [22]. Based on past research, companies have used differentiated strategies in green marketing to satisfy consumer green demand [22,23]. Prior research has thus argued that if green marketing activities exhibit positive environmental behaviors and attitudes, they can satisfy consumer demand and positively impact green satisfaction [22,24–26]. Therefore, this study proposes the following initial hypothesis:

Hypothesis 1 (H1). The degree of a product's environmental friendliness has a positive influence on its green satisfaction.

Due to global warming, consumers are willing to pay more attention to the environment, and are becoming committed to buying green products [27]. Therefore, companies are eager to enhance 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 quality [25]. 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 perceived quality.

Green trust is defined as “a willingness to depend on a product, service, or brand based on the belief or expectation resulting from its credibility, benevolence, and ability about its environmental performance” [22,24,25,29,30]. 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]. This study claims that green trust of a product 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 trust.

2.3. Green Satisfaction

Traditionally, customer satisfaction is perceived as a determinant of long-term customer behavior. Among “dissatisfied” customers, 91% are unwilling to repurchase the products, and would only convey to others positive emotions [32]. In other words, only satisfied customers will repeat buying behavior and bring long-term benefits to businesses; therefore, enhancing customer satisfaction is a

major for most companies [33]. Satisfaction has been widely used to measure the relationship between consumers and businesses, while higher satisfaction indicates a higher chance that customers will repurchase a product [34]. Overall, satisfaction is defined as the emotional impact of a product on consumers after they have evaluated their use of the product [35].

Consumer satisfaction can well explain purchase behaviors such as complaints or word-of-mouth effect; satisfaction of a product or service is thus an essential determinant in customer relationship [36]. In marketing, trust is a higher level of evaluation attribute than satisfaction. When customers are satisfied with a transaction and feel secure in their relationship with the vendor, they develop trust and are willing to believe the promises of the business [37]. Satisfaction goal affects trust, and trust in turn affects commitment in a one-way causal relationship [38].

Previous research indicates that satisfaction positively affects trust, so satisfaction is an antecedent of trust [39]. As a result, customer satisfaction has a positive impact on trust, commitment and future willingness to buy [4]. By further dividing satisfaction into economic satisfaction and non-economic satisfaction, prior research shows that both economic and non-economic satisfaction significantly affect trust [40]. Satisfaction is emphasized in the customer relationship management, because of its impact on long-term relationship, loyalty, repurchase intention, trust, and word-of-mouth effect [41]. Based on the above, satisfaction generates customer trust toward a service or product provider, and this study therefore proposes the following hypothesis:

Hypothesis 4 (H4). A product's green satisfaction has a positive influence on its green trust.

2.4. Green Perceived Quality

Product quality can be divided into “objective quality” and “perceived quality.” Objective quality describes the technological advantages or strengths of products using measurable or expected standards. Perceived quality is based on product or service user overall assessment of product or service excellence or superiority, and is usually more highly abstract than simple reference to product attributes [42].

The main reasons for the differences between perceived quality and objective quality are: (1) perceived quality is affected by pre-existing consumer impression; (2) consumer perception of important quality dimensions differ from that of manufacturers; and (3) due to information disparity, consumers fail to obtain comprehensive information, and thus make inferences about product quality based on only one or two selected pieces of information [43]. However, past research suggests that all quality measures are of perceived quality because quality perception is the result of assessment, and therefore, in reality, objective quality is non-existent [44].

Perceived quality is defined as “the overall assessment of product or service excellence or superiority by the user” [42]. Measures of perceived quality can be determined by the five dimensions: ease of use, functionality, performance, service capability, and reputation [45].

If consumers have no prior experience with buying a product, trust belief cannot be based on past experience in the early stage of purchasing; thus perceived quality of the product influences the consumers in their buying decisions [46]. Furthermore, brand trust appears to serve as a key factor of brand commitment and brand loyalty [47].

Past research has shown that perceived quality can help enhance mutual trust between consumers and sellers [44]. In fact, even perceived quality positively affects trust [48]. Trust indicates the degree of perceived reliability or confidence that consumers have toward a person, event, object or process. Thus positive consumer feelings about the reliability or quality of a product or service increase consumer trust in the product. Past literature argues that perceived quality is an antecedent of trust [45], and therefore this study proposed the following hypothesis:

Hypothesis 5 (H5). A product's green perceived quality has a positive influence on its green trust.

2.5. Green Trust

Trust is a belief that the other party is reliable and dependable, and that the other party is not manipulative and is committed to its promises [49]. Trust is based on integrity, benevolence and competence. In marketing, trust is often defined according to social psychology studies, which maintain that trust is based on the reliability and goodwill of the other party. Reliability refers to the degree of trust toward speech, words and behaviors, whereas goodwill refers to concern about the goals and welfare of both parties, and the pursuit of the greatest common interest [50].

As consumers trust increases, anxiety and uncertainty are reduced, and the integrity of the brand or company is strengthened. Previous research has asserted that the foundation of trust is divided into four dimensions—cognition base, affect base, experience base and personality oriented—as follows [51]:

- (1) Affect-based dimension refers to the impact of outside third-party influence on consumer perception of a business.
- (2) Experience-based dimension refers to consumers' overall evaluation of their cumulative interaction with a company.
- (3) Cognition-based (observation-based) dimension refers to the impact of direct consumer interaction with a merchant on consumer perception.
- (4) Personality-oriented dimension refers to the personal characteristics and shopping habits of consumers.

Based on the above model, this research proposes that there are mediators bridging the relationship between a product's environmental friendliness and green trust. Firstly, this study posits that green satisfaction reflects an experience-based dimension, thereby encouraging a relationship between environmental friendliness and green trust. Secondly, this study asserts that green perceived quality represents a cognition-based dimension and that a product's green perceived quality mediates the relationship between its environmental friendliness and green trust. Hence, two other hypotheses are proposed in the following:

Hypothesis 6 (H6). A product's green satisfaction mediates the relationship between its environmental friendliness and green trust.

Hypothesis 7 (H7). A product's green perceived quality mediates the relationship between its environmental friendliness and green trust.

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

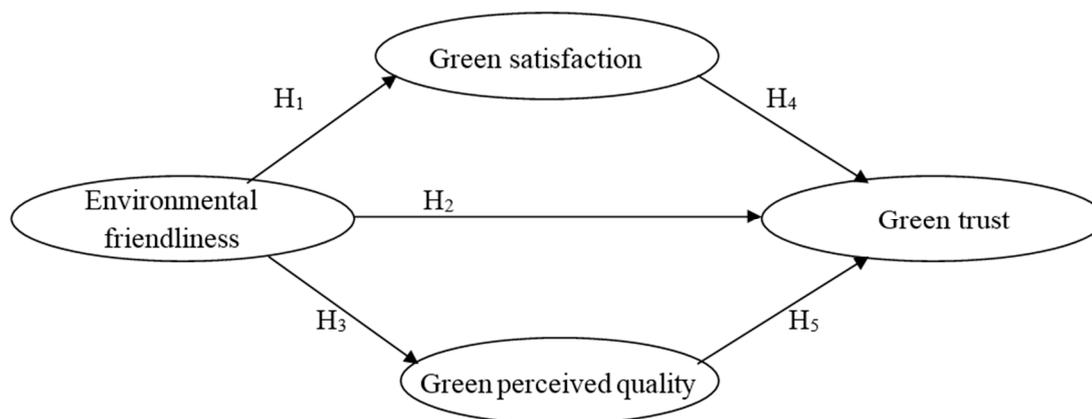


Figure 1. Research framework.

3. Methodology and Measurement

3.1. 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%.

3.2. 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.” The measurement of environmental friendliness includes three items: (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 satisfaction. Satisfaction is the overall pleasure or perceived satisfaction that consumers obtained from the quality of a product or service, and fulfilling customer expectation and demand is considered a determining factor in long-term customer behavior. Based on the prior literature, the operational definition of green satisfaction is “a pleasurable level of consumption-related fulfillment to satisfy a customer’s environmental desires, sustainable expectations, and green needs [22,25,26].” The measurement of green satisfaction includes six items: (1) You are glad about the decision to select this product because of its environmental image; (2) You think that it is a right decision to purchase this product because of its environmental functionality; (3) Overall, you are happy to purchase this product because it is environmentally friendly; (4) From an environmental effectiveness perspective, buying that product is the right decision; (5) You are satisfied with the environmental appeal of that product; (6) Overall, you are satisfied with this product because of its environmental performance.

Green perceived quality. Perceived quality which is different from objective quality is based on consumer overall evaluation of the superiority or excellence of a product or service [42]. This study refers to Chen and Chang [27], Chen and Chang [25], and Chen *et al.* [26] to define green perceived quality as “the customer’s judgment about a brand’s overall environmental excellence or superiority.” The measurement of green perceived quality includes five items: (1) The quality of this product is regarded as the best benchmark with respect to environmental concern; (2) The quality of this product is reliable with respect to environmental consideration; (3) The quality of this product is durable with respect to environmental performance; (4) The quality of this product is excellent with respect to environmental performance; (5) The quality of this product is professional with respect to environmental reputation.

Green trust. Based on the research of Chen [22], this study defines “green trust” as “a willingness to depend on a product, service, or brand based on the belief or expectation resulting from its credibility, benevolence, and ability about its environmental performance.” In addition, this study refers to Chen and Chang [29], Chen and Chang [30], Chen and Chang [25], and Chen [24] to measure green trust, and its measurement includes four items: (1) You believe that this product’s environmental image is generally reliable; (2) You think that this product’s environmental functionality is generally

dependable; (3) Overall, you believe that this product's environmental claims are trustworthy; (4) This product's environmental performance meets your expectations.

4. 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 use questionnaire survey to measure the four constructs, environmental friendliness, green satisfaction, green perceived quality, and green trust, 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.

4.1. 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 0.658, 0.723, 0.587 and 0.667. 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 satisfaction, are 0.8106 and 0.8499 which are more than the correlation, 0.789, 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		5.181	0.912
EF_1	You believe that this product is environmentally friendly.	5.090	1.040
EF_2	You believe that using this product can reduce environmental impact.	5.363	1.025
EF_3	Compared to other similar products, this product is more environmentally friendly.	5.090	1.036
Green Satisfaction		5.275	0.894
GS_1	You are glad about the decision to select this product because of its environmental image.	5.229	1.014
GS_2	You think that it is a right decision to purchase this product because of its environmental functionality.	5.229	1.029
GS_3	Overall, you are happy to purchase this product because it is environmentally friendly.	5.329	0.996
GS_4	From an environmental effectiveness perspective, buying that product is the right decision.	5.407	0.972
GS_5	You are satisfied with the environmental appeal of that product.	5.256	1.035
GS_6	Overall, you are satisfied with this product because of its environmental performance.	5.164	1.049
Green Perceived Quality		4.987	0.870
GPQ_1	The quality of this product is regarded as the best benchmark with respect to environmental concern.	4.732	1.041
GPQ_2	The quality of this product is reliable with respect to environmental consideration.	5.172	0.991
GPQ_3	The quality of this product is durable with respect to environmental performance.	4.866	1.128
GPQ_4	The quality of this product is excellent with respect to environmental image.	5.027	1.089
GPQ_5	The quality of this product is professional with respect to environmental reputation.	5.136	1.053
Green Trust		5.047	0.917
GT_1	You believe that this product's environmental image is generally reliable.	5.073	1.025
GT_2	You think that this product's environmental functionality is generally dependable.	5.205	0.981
GT_3	Overall, you believe that this product's environmental claims are trustworthy.	4.805	1.166
GT_4	This product's environmental performance meets your expectations.	5.105	1.044

Table 2. Item loadings (λ), Cronbach's α and AVE (average variation extraction).

Construct	Question Item	Item Loading (λ)	Cronbach's α	AVE
Environmental Friendliness	EF_1	0.841	0.859	0.658
	EF_2	0.833 ***		
	EF_3	0.756 ***		
Green Satisfaction	GS_1	0.802	0.942	0.723
	GS_2	0.857 ***		
	GS_3	0.887 ***		
	GS_4	0.844 ***		
	GS_5	0.855 ***		
	GS_6	0.852 ***		
Green Perceived Quality	GPQ_1	0.705	0.882	0.587
	GPQ_2	0.805 ***		
	GPQ_3	0.726 ***		
	GPQ_4	0.789 ***		
	GPQ_5	0.801 ***		
Green Trust	GT_1	0.832	0.892	0.667
	GT_2	0.894 ***		
	GT_3	0.736 ***		
	GT_4	0.797 ***		

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 Satisfaction (GS)	0.789 ***	0.8499		
Green Perceived Quality (GPQ)	0.656 ***	0.693 ***	0.7663	
Green Trust (GT)	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: *** $p < 0.01$.

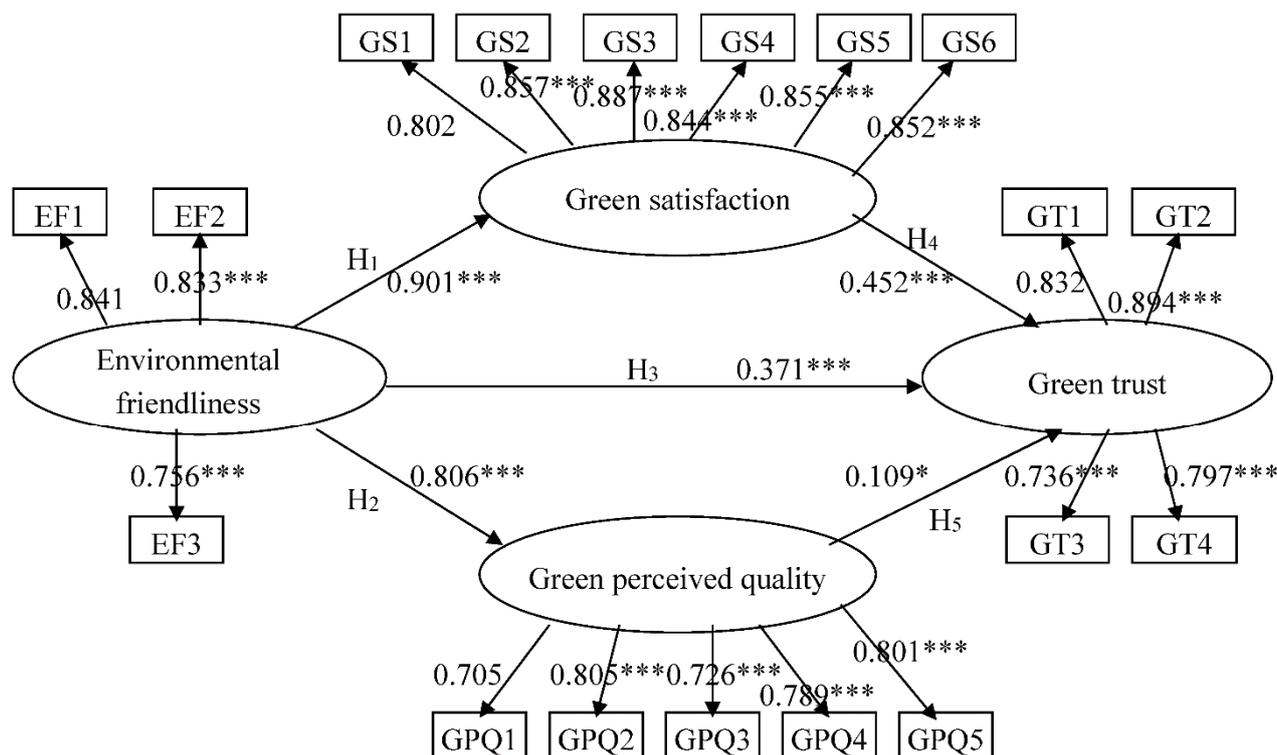
4.2. The Results of the Structural Model

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.

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]

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.



GFI=0.927, RMSEA=0.06, AGFI=0.9, NFI=0.952, CFI=0.969

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

Table 5. Results of path analysis.

Hypothesis	Path Correlation	Standardized Path Coefficient
H ₁	Environmental friendliness → Green satisfaction	0.901 ***
H ₂	Environmental friendliness → Green perceived quality	0.806 ***
H ₃	Environmental friendliness → Green trust	0.371 ***
H ₄	Green satisfaction → Green trust	0.452 ***
H ₅	Green perceived quality → Green trust	0.109 *

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

Besides the direct effect between environmental friendliness and green trust, Table 6 shows that there are two significant indirect effects between environmental friendliness and green trust. Speaking of the first indirect effect between environmental friendliness and green trust, environmental friendliness can positively affect green trust indirectly via green satisfaction which accounts for the indirect effect coefficient, 0.407, in Table 6. In regards to the second indirect effect between environmental friendliness and green trust, environmental friendliness can positively affect green trust indirectly via green perceived quality, which accounts for the indirect effect coefficient, 0.0879, in Table 6. Therefore, green satisfaction and green perceived quality have partial mediation effects between environmental friendliness and green trust. As a result, H6 and H7 are supported in this study.

Table 6. Direct and indirect effects of environmental friendliness.

Direct Effect	0.371
Indirect Effects	
Degree of environmental friendliness → Green satisfaction → Green trust	0.407
Degree of environmental friendliness → Green perceived quality → Green trust	0.0879
Total Indirect Effect	0.4949
Total Effect	0.8659

5. Conclusions and Implications

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

This research points out that environmental friendliness of a product has three approaches to positively influence its green trust. The first approach is that environmental friendliness of a product can positively affect its green trust directly. The second approach is that environmental friendliness of a product can positively influence its green trust indirectly via its green satisfaction. The third approach is that environmental friendliness of a product can positively affect its green trust indirectly via its green perceived quality. Companies should raise environmental friendliness of their products such that green marketing could become mainstream 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 trust and to investigate the partial mediation effects of green satisfaction and green perceived quality. Companies have to increase environmental friendliness of their products and raise green satisfaction and green perceived quality of their products to increase green trust of their products. It is therefore beneficial for firms to develop strategies for increasing environmental friendliness of their products and raising green perceived quality and green satisfaction of their products in order to increase green trust of their products to create a longer-term relationship in the environmental era. Since firms have finite resources, they should well deploy their resources to enhance three positive determinants of green trust: environmental friendliness, green satisfaction and green perceived quality. Hence, companies

should utilize every chance to raise environmental friendliness of their products and enhance green perceived quality and green satisfaction of their products.

There are four theoretical contributions in this paper. Firstly, this paper combines the ideas of perceived quality and satisfaction to extend the research on green marketing and to build up green trust from the increase of environmental friendliness, green satisfaction and green perceived quality. Secondly, there is no prior research discussing the relationship between environmental friendliness and green trust. This study proves that environmental friendliness positively affects green trust to fill the research gap. Thirdly, this study indicates that the relationship between environmental friendliness and green trust is partially mediated by green satisfaction and green perceived quality. Fourthly, raising environmental friendliness, green satisfaction and green perceived quality can help firms to increase their customers' green trust. 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 satisfaction and green perceived quality, but also enhance its green trust. If companies would like to improve their consumers' green trust for their products, they have to enhance their products' environmental friendliness, green satisfaction and green perceived quality. 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 satisfaction and green perceived quality in order to enhance green trust. Thirdly, firms should raise green satisfaction and green perceived quality of their products. Because there are significant mediation effects of green satisfaction and green perceived quality in this study, companies can enhance green satisfaction and green perceived quality of their products to improve their green trust. Fourthly, this paper demonstrates that environmental friendliness of a product is positively associated with green satisfaction and green perceived quality that are positively associated with green trust. Environmental friendliness of a product does not only positively influence green trust directly, but also positively affects it via green satisfaction and green perceived quality indirectly.

This study explores the influence of environmental friendliness on green trust and discusses the mediation effects of green satisfaction and green perceived quality. Chen and Chang [30] explore the influence of "greenwash" on green trust and to investigate the mediation effects of green consumer confusion and green perceived risk. In contrast to Chen and Chang [30], who indicate that greenwash is a negative determinant of green trust, this study demonstrates that environmental friendliness is a positive determinant of green trust. Chen and Chang [25] discuss the influences of green perceived quality and green perceived risk on green trust and investigate the mediation effect of green satisfaction. Whereas Chen and Chang [25] indicate that green perceived risk is a negative determinant of green trust, this study demonstrates that environmental friendliness is a positive determinant of green trust. Chen and Chang [25] also point out that green perceived quality is a positive determinant of green trust, though this research proves that green perceived quality is a mediator between environmental friendliness and green trust. On the other hand, this study also reveals that green satisfaction positively affects green trust, a result supported by Chen and Chang [25]. Moreover, this study also demonstrates that green perceived quality positively affects green trust. 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 satisfaction and green perceived quality and further enhance green trust. 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 to see how results compare or vary. 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 satisfaction, green perceived quality, and green trust 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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Author Contributions

Yu-Shan Chen initiated the project and conceptualized the paper. Ching-Ying Lin analyzed the data and completed the paper in English. Chia-Sui Weng made contributions in data collection and writing material.

Conflicts of Interest

The authors declare no conflict of interest.

References

1. Yang, C.; Wang, Y.; Fong, L.; Hsieh, S. A study of the hospitality personal cognizance, attitude and behavior toward practice of green productivity. *J. Tour. Stud.* **2007**, *13*, 165–192.
2. Krause, D. Environmental Consciousness: An Empirical Study. *J. Environ. Behav.* **1993**, *25*, 126–142.
3. Henriques, I.; Sadosky, P. The determinants of an environmentally responsive firm: An empirical approach. *J. Environ. Econ. Manag.* **1996**, *30*, 381–395.
4. Garbarino, E.; Johnson, M.S. The different roles of satisfaction, trust, and commitment in customer relationships. *J. Mark.* **1999**, *63*, 70–87.
5. Oliver, R.L. What is Customer Satisfaction. *Whart. Mag.* **1981**, *5*, 36–41.
6. Shao Yeh, Y.; Li, Y.-M. Building trust in m-commerce: Contributions from quality and satisfaction. *Online Inf. Rev.* **2009**, *33*, 1066–1086.
7. Kardes, F.R.; Posavac, S.S.; Cronley, M.L. Consumer inference: A review of processes, bases, and judgment contexts. *J. Consum. Psychol.* **2004**, *14*, 230–256.

8. Kotler, P. *Marketing Management: Analysis, Planning, Implementation, and Control*; Prentice Hall: Upper Saddle River, NJ, USA, 1999.
9. Chen, Y.-S.; Chang, C.-H.; Lin, Y.-H. The Determinants of Green Radical and Incremental Innovation Performance: Green Shared Vision, Green Absorptive Capacity, and Green Organizational Ambidexterity. *Sustainability* **2014**, *6*, 7787–7806.
10. Kontogianni, E.; Kouthouris, C. Investigating environmentally friendly behavior among users and visitors of a Greek ski resort. *Trends Sport Sci.* **2014**, *21*, 101–110.
11. Zimmer, M.R.; Stafford, T.F.; Stafford, M.R. Green issues: Dimensions of environmental concern. *J. Bus. Res.* **1994**, *30*, 63–74.
12. Minton, A.P.; Rose, R.L. The effects of environmental concern on environmentally friendly consumer behavior: An exploratory study. *J. Bus. Res.* **1997**, *40*, 37–48.
13. McCarty, J.A.; Shrum, L. The recycling of solid wastes: Personal values, value orientations, and attitudes about recycling as antecedents of recycling behavior. *J. Bus. Res.* **1994**, *30*, 53–62.
14. Han, H.; Hsu, L.-T.; Lee, J.-S. Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process. *Int. J. Hosp. Manag.* **2009**, *28*, 519–528.
15. Schwartz, S.H. Normative explanations of helping behavior: A critique, proposal and empirical test. *J. Exp. Soc. Psychol.* **1973**, *9*, 349–364.
16. Black, J.S.; Stern, P.C.; Elworth, J.T. Personal and contextual influences on household energy adaptations. *J. Appl. Psychol.* **1985**, *70*, 3–21.
17. Hopper, J.R.; Nielsen, J.M. Recycling as altruistic behavior. *Environ. Behav.* **1991**, *23*, 195–220.
18. Stern, P.C.; Dietz, T.; Guagnano, G.A. The new ecological paradigm in social-psychological context. *Environ. Behav.* **1995**, *27*, 723–743.
19. Chen, Y.-S.; Chang, C.-H.; Lin, Y.-H. Green Transformational Leadership and Green Performance: The Mediation Effects of Green Mindfulness and Green Self-Efficacy. *Sustainability* **2014**, *6*, 6604–6621.
20. Xiao, X.; Xia, Z.; Zhang, X.; Qu, J.; Zhang, X.; Lan, R.; Chen, H. New Development on Environmentally Friendly Coatings. *J. Chem. Ind. Eng. (China)* **2003**, *54*, 531–537.
21. Young, W.; Hwang, K.; McDonald, S.; Oates, C.J. Sustainable consumption: Green consumer behaviour when purchasing products. *Sustain. Dev.* **2010**, *18*, 20–31.
22. Chen, Y.S. The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *J. Bus. Ethics* **2010**, *93*, 307–319.
23. Polonsky, M.J. An introduction to green marketing. *Electron. Green J.* **1994**, *1*, 1–10.
24. Chen, Y.S. Towards green loyalty: Driving from green perceived value, green satisfaction, and green trust. *Sustain. Dev.* **2013**, *21*, 294–308.
25. Chen, Y.-S.; Chang, C.-H. Towards green trust: The influences of green perceived quality, green perceived risk, and green satisfaction. *Manag. Decis.* **2013**, *51*, 63–82.
26. Chen, Y.-S.; Lin, C.-L.; Chang, C.-H. The influence of greenwash on green word-of-mouth (green WOM): The mediation effects of green perceived quality and green satisfaction. *Qual. Quant.* **2014**, *48*, 2411–2425.
27. Chang, C.-H.; Chen, Y.-S. Managing green brand equity: The perspective of perceived risk theory. *Qual. Quant.* **2013**, *48*, 1753–1768.

28. Laufer, W.S. Social accountability and corporate greenwashing. *J. Bus. Ethics* **2003**, *43*, 253–261.
29. Chen, Y.-S.; Chang, C.-H. Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust. *Manag. Decis.* **2012**, *50*, 502–520.
30. Chen, Y.-S.; Chang, C.-H. Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *J. Bus. Ethics* **2013**, *114*, 489–500.
31. Foxman, E.R.; Berger, P.W.; Cote, J.A. Consumer brand confusion: A conceptual framework. *Psychol. Mark.* **1992**, *9*, 123–141.
32. Murga-Menoyo, M. Learning for a sustainable economy: Teaching of green competencies in the university. *Sustainability* **2014**, *6*, 2974–2992.
33. Ranaweera, C.; Prabhu, J. The influence of satisfaction, trust and switching barriers on customer retention in a continuous purchasing setting. *Int. J. Serv. Ind. Manag.* **2003**, *14*, 374–395.
34. Cardozo, R.N. An experimental study of customer effort, expectation, and satisfaction. *J. Mark. Res.* **1965**, *2*, 244–249.
35. Wong, A. Integrating supplier satisfaction with customer satisfaction. *Total Qual. Manag.* **2000**, *11*, 427–432.
36. Sheu, J.B. Green supply chain collaboration for fashionable consumer electronics products under third-party power intervention—A resource dependence perspective. *Sustainability* **2014**, *6*, 2832–2875.
37. Ravald, A.; Grönroos, C. The value concept and relationship marketing. *Eur. J. Mark.* **1996**, *30*, 19–30.
38. Geyskens, I.; Steenkamp, J.-B.E.; Kumar, N. A meta-analysis of satisfaction in marketing channel relationships. *J. Mark. Res.* **1999**, *36*, 223–238.
39. Oliver, R.L. *Satisfaction: A Behavioral Perspective on the Customer*; McGraw Hill: New York, NY, USA, 1997.
40. Chen, C.-N.; Lin, S.-Y.; Ting, S.-C. The Relationships of Trust, Commitment, and the Related Factors: An Empirical Study of the Franchise Systems. *Taiwan Acad. Manag. J.* **2005**, *5*, 209–229.
41. Walter, A.; Mueller, T.A.; Helfert, G. The impact of satisfaction, trust, and relationship value on commitment: Theoretical considerations and empirical results. In Proceedings of the 16th IMP Conference, Bath, UK, 7–9 September 2000.
42. Zeithaml, V.A. Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *J. Mark.* **1988**, *52*, 2–22.
43. Aaker, D.A. *Building Strong Brands*; Simon and Schuster: New York, NY, USA, 2012.
44. Sweeney, J.C.; Soutar, G.N.; Johnson, L.W. The role of perceived risk in the quality-value relationship: A study in a retail environment. *J. Retail.* **1999**, *75*, 77–105.
45. Brucks, M.; Zeithaml, V.A.; Naylor, G. Price and brand name as indicators of quality dimensions for consumer durables. *J. Acad. Mark. Sci.* **2000**, *28*, 359–374.
46. Lowry, P.B.; Vance, A.; Moody, G.; Beckman, B.; Read, A. Explaining and predicting the impact of branding alliances and web site quality on initial consumer trust of e-commerce web sites. *J. Manag. Inf. Syst.* **2008**, *24*, 199–224.
47. Chaudhuri, A.; Holbrook, M.B. The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *J. Mark.* **2001**, *65*, 81–93.

48. Gregg, D.G.; Walczak, S. The relationship between website quality, trust and price premiums at online auctions. *Electron. Commer. Res.* **2010**, *10*, 1–25.
49. Luhmann, N. *Trust and Power*; Wiley: Hoboken, NJ, USA, 1979.
50. Lin, L.-Y.; Wang, J.-F.; Huang, L.-M. The Impacts of Service Quality, Promotion Strategy, Perceived Value and Customer Trust on Customer Satisfaction: An Example of the Taxpayers of Taipei Country Tax Bureau. *Mark. Rev./Xing Xiao Ping Lun* **2011**, *8*, 433–452.
51. Kim, D.J.; Ferrin, D.L.; Rao, H.R. A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decis. Support Syst.* **2008**, *44*, 544–564.
52. Hair, J.F.; Anderson, R.E.; Tatham, R.L.; Black, W.C. *Multivariate Data Analysis*; Pearson Prentice Hall: Upper Saddle River, NJ, USA, 1998.
53. Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 39–50.
54. Bagozzi, R.P.; Yi, Y. On the evaluation of structural equation models. *J. Acad. Mark. Sci.* **1988**, *16*, 74–94.
55. Bentler, P.M.; Bonnett, D.G. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol. Bull.* **1990**, *88*, 588–606.

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