

*Article*

# The Influence of Green Viral Communications on Green Purchase Intentions: The Mediating Role of Consumers' Susceptibility to Interpersonal Influences

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**Abstract:** This paper aims to incorporate the diffusion of innovation theory and conformity theory to explain consumers' green purchase intentions. To this end, a conceptual model has been proposed and subjected to empirical verification with the use of a survey method. Using a sample of Taiwanese consumers who had the actual purchase experience of green detergents, this study employed structural equation modeling to verify the hypothesis proposed. The empirical results suggested that green viral communication was positively related to normative interpersonal influence, informational interpersonal influence and green purchase intention. Informational interpersonal influence also had a positive impact on green purchase intention. However, the relationship between consumer's normative interpersonal influence and green purchase intention was not supported. Thus, this study concludes that green marketers must strengthen their green viral communications skills to enhance consumers' purchase intentions. In addition, this study also contributes to the literature by stating that consumers' susceptibility to informational interpersonal relationships is an important mediator in the green viral communication and green purchase intentions relationship. This study discusses implications of the findings and research limitations at the end of the paper.

**Keywords:** green viral communication; green purchase intention; normative interpersonal influence; informational interpersonal influence; green marketing.

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## 1. Introduction

In recent years, research interests on green marketing are increasing at a fast pace [1–3]. Prior studies have defined the term “Green” as “recycling, purchasing and using environment friendly products that have minimal damage to the environment” [4,5]. Based on the definition, green products are referred to those products that “are typically durable, non-toxic, made from recycled materials, or minimally packaged” [6]. Because of the growing concern about green management and environmentally friendly products nowadays [7,8], consumers are starting to consider purchasing green products [9]. Such decisions include, for example, using kitchen appliances that would consume less power; driving hybrid cars that could emit less air pollution; using solar or wind power to produce electricity [10]. As a matter of fact, recent research has indicated that more and more companies are joining in the green products market [11,12], either out of their interest in environmental protection or a desire to market their green products in the environmental era. While making green purchase decisions, green consumers are giving importance to their role in protecting the environment [13]. Therefore, in order to understand the growing green market, it is imperative for companies to understand the different facets of green consumption patterns [14,15].

However, prior study has indicated that although, generally speaking, consumers are willing to purchase green products when being asked; the actual purchase rate was comparatively low [16]. To this end, recent research on green marketing have begun to explore the casual relationship between green purchase intentions and its antecedents, such as green organizational identity [2,17], green brand image [2], green trust [13,14,18,19], and green satisfaction [14,18]. However, prior studies have indicated that these green constructs could only represent a subset of green consumers’ perceptions, and could have limited power to fully explain green consumers’ purchasing behaviors [20,21].

To bridge the gap in the literature, this study aims to explain the green consumption phenomena by adopting the perspectives from the diffusion of innovation theory [22]. The diffusion of innovation theory states that innovation adoption and diffusion is primarily a social process and the role of inter-personal communications should be a key role player in the process of adoption of new products. Following this vein, this study differentiates from other studies by interpreting the emergence of green consumption as a form of new product innovation. Through green viral communication, this study argued that the opinion leaders of green products could influence other consumers’ susceptibility to interpersonal influences, which could further influence their green purchase intentions.

Moreover, this study also suggested that green consumer’s conformity behaviors, or susceptibility to interpersonal influences could be another factor that should be put into consideration. While green consumption is becoming a more important topic in the field, none of the earlier studies have addressed how consumers’ susceptibility to interpersonal influences could affect consumers’ green purchase intentions. Originated from the Social Psychology discipline, Conformity theory is now widely applied in consumer research [23–26]. The relationship between interpersonal influences and consumer purchase intentions is discussed in prior studies [27]. Based on Conformity theory, this study thus proposes that green consumers’ conformity behaviors (*i.e.*, perceived susceptibility to normative interpersonal influences and perceived susceptibility to informational interpersonal influence) are important mediators in the green viral communication-green purchase intention relationship.

Specifically, the goal of the present study was threefold: (1) to explain the effects that green viral communication might play from the diffusion of innovation theory perspective; (2) to examine the mediation effects that green consumers' susceptibility to interpersonal influences may play in the green viral communication-green purchase intention relationship, from the conformity theory perspective; and (3) to integrate and examine a new framework of green purchase intentions in compliance with the two theories mentioned, thus helping green marketers to increase their green product sales. The rest of the article was structured as follows. A literature review is discussed in the next section. Several research hypotheses are developed based on the literature review. Then, the methodology employed in this study, data collection methods, and the measurements of the constructs are described. In addition, the descriptive statistics, factor analysis, reliability, validity, and the results of structural equation modeling (SEM) are reported in the following section. Last, the conclusions, implications, and future research directions are discussed at the end of this paper.

## 2. Literature Review and Conceptual Model

### 2.1. Green Consumption

In the last decade, the emergence of green consumption is one of the frequently discussed issues [28,29]. The word “Green” refers to “recycling, purchasing and using environment friendly products that have minimal damage to the environment” [4,5]. Researchers have indicated that prices of green products are usually more expensive, apart from their functional utility [10]. However, prior research also suggests that green products could enable consumers to satisfy their socio-psychological needs to a greater degree than their regular counterparts [30]. Observing the growth of sales of green products/brands in the last decade, scholars have started paying attention to the phenomenon of green consumption [31]. For example, past research efforts have focused on the determinants of green purchase behavior [32]; cross-cultural comparison of green consumers' behaviors [33], green advertising [5,34], *etc.* Green products are one of the most fastest-growing brand segments, yet at the same time the social influences associated with green consumption are still under-investigated [20,21].

### 2.2. Diffusion of Innovation Theory and Green Viral Communication

The Diffusion of Innovation Theory was developed by Rogers in his book, *Diffusion of Innovations* [22]. The term “diffusion” refers to the process by which an innovation is spread via communication channels among the members of a specific social group [22]. In other words, diffusion is a special type of communication mechanism that concerned with the spread of messages that consumers would be perceived as new ideas. In addition, innovation is defined as “an idea perceived as new by the individual” [22]. The essence of the diffusion of innovation refers to the process that occurs as people try to adopt new ideas or products. An old but classic study by Katz and Lazarsfeld [24] explained the adoption process by introducing the concept of opinion leaders, opinion followers and how the communication interacts to influence between opinion leaders and followers.

A variety of research from a broad variety of disciplines has applied the diffusion of innovation theory as a framework [35–39]. Mustonen-Ollila and Lyytinen [35] indicated several of these disciplines, such as sociology, psychology, communications, political science, economics, technology, *etc.*, and

concluded that diffusion of innovation theory is a widely applied theoretical framework in the area of new product diffusion and adoption. However, few attempts have been tried to adopt it in the green context. From the theory of diffusion of innovation perspective, this study examines the effects of green viral communication and its role as a potential tool in the green marketing communications field. Literature refers viral communication as “oral, person-to-person communications between a communicator and a receiver who perceives the message as non-commercial although the subject is a brand, product, or service” [40]. As the communication environment has changed significantly since the last decades, the research on viral communication has been shifted into online and mobile environments [41,42]. Since the early 1950s, studies have provided evidence that viral communication could influence consumers’ behavioral choices, such as purchase decisions [24,43]. In the green context, green viral communication was defined as “the extent to which a consumer would infer friends, relatives, and colleagues about positive environmental messages of a product or a brand” [16]. Although previous research has paid attention to the relevant issues about viral communication, no existing study discusses the green viral communication—green purchase intention relationship in the green context.

### *2.3. Conformity Theory*

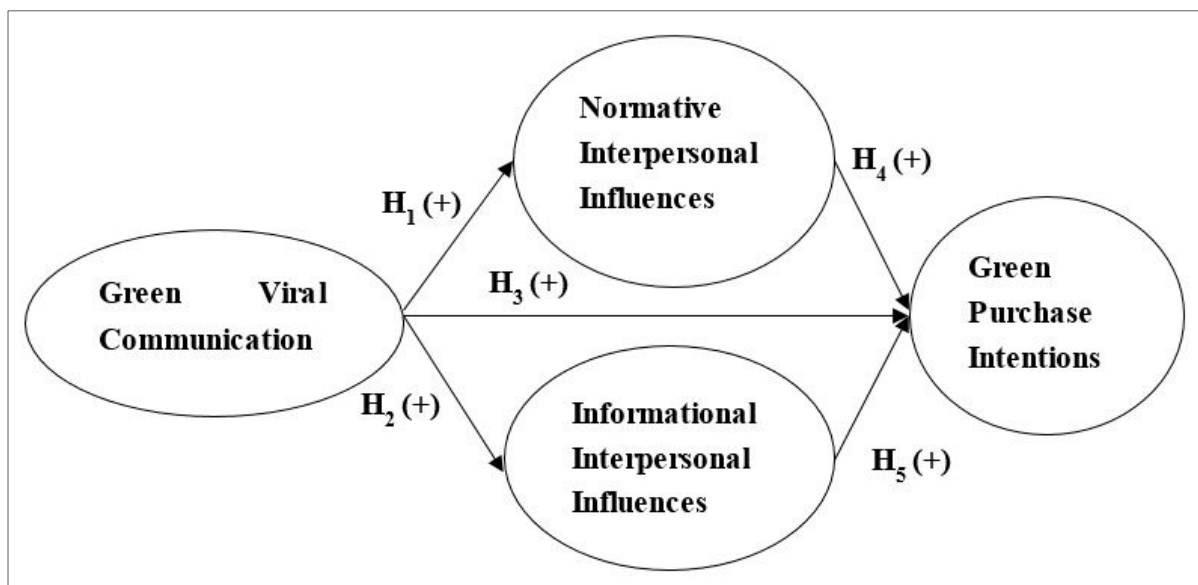
The issue of conformity theory, or consumers’ susceptibility to interpersonal influences has received considerable attention [23,25,27,44]. Literature indicated that consumers’ conformity behavior was classified into two dimensions: normative interpersonal influences and informational interpersonal influences [23,25,27]. Burnkrant and Cousineau (1975) defined normative influences as “the tendency to conform to the expectations of others”, while informational interpersonal influence was defined as “the tendency to accept information from others as evidence of reality” [27]. Prior study posits that, consumers hardly ever took decisions in isolation and are thus likely to seek out groups for affiliation [44]. From the green perspective, prior studies have suggested that green consumption is a social and psychological phenomenon and consumers use such consumption as a means to help the sustainability of the environment [45]. Therefore, green consumption may be highly susceptible to interpersonal influences. While green products are highly visible within our daily life nowadays, none of the earlier studies address how interpersonal influences may affect consumers’ green purchase intentions.

### *2.4. Green Purchase Intentions*

In the green marketing literature, green purchase intentions were generally referred as consumers’ tendency to pay a premium for a green product/brand [46]. Other scholars define green purchase intentions as “the likelihood that a consumer would buy a particular product resulting from his or her environmental needs” [13]. Green consumers purchased a green product/brand when they believed it offered the right green elements, which might generate less pollutes to the environment, and further enhances sustainability [10]. According to the literature, many studies reported a strong causal relationship between green consumers’ attitude and preference toward a green product/brand [13,47]. For example, Chan and Lau [33] explored the green purchase intentions of Chinese consumers from a cultural perspective. From green consumers’ attitudinal perspective, Chen and Chang [13] discussed the

casual relationship between green perceived value, green perceived risk, and green trust on green purchase intentions.

To better understand the purposes of this study, a conceptual framework was depicted in Figure 1. This study suggested that it is crucial to examine the concepts of green viral communication and consumers' conformity behaviors in order to explain green purchase intentions. This study proposes that green viral communication behaviors of opinion leaders positively affect green purchase intentions, while consumers' informational interpersonal influences and normative interpersonal influences mediate the relationship between green viral communication and green purchase intentions. In summary, the detailed hypotheses were discussed in the following sections.



**Figure 1.** Research framework.

### 3. Hypothesis Development

#### 3.1. The Positive Effect of Green Viral Communication on Normative Interpersonal Influences

The diffusion of innovation theory suggested that opinion leaders were among the first adopters of new products and tend to use viral communications to influence followers in terms of search and purchase new products [38,39]. Through informal channels, the messages that opinion leaders sent via viral communications played a major role in influencing consumers' perceptions regarding to the decision-making process [38]. In practice, marketers often attempt to create communication channels to reach opinion leaders in order to encourage them to spread positive viral communications to their followers [48]. Opinion leaders' viral communication behavior could not only influences consumers' purchase decisions [24], but shapes pre-usage perceptions/behaviors [49]. Given that assumption, this argument could be further extended from the conformity theory literature, which suggested that consumers adopt new products due to their likings or trust towards opinion leaders [26]. Thus, if green consumers perceived a positive using/purchasing experience of green products from opinion leaders, it is likely these green consumers would want to purchase/use the same green products due to their likings or trust towards opinion leaders. Following this vein, green viral communication behavior of opinion

leaders may have impacts on following green consumers' susceptibility to normative interpersonal influences. Based on this and the preceding arguments, the following hypothesis was formulated:

*Hypothesis 1 (H1): In the green context, opinion leaders' green viral communication behavior has a positive impact on consumers' normative interpersonal influences.*

### *3.2. The Positive Effect of Green Viral Communication on Informational Interpersonal Influences*

Green marketing literature suggested that consumers were reluctant to adopt green products because green claims on green products are sometimes unclear and untrustworthy [16]. From the diffusion of innovation perspective [22], the low adoption rate of green products could be contributed to the reason that consumers perceive green products as a new form of innovation, or a new product. Green consumption is a new concept that has been developed recently [2,5], thus it is natural to assume that consumers' adoption to green products are still at its early stage. The diffusion of innovation theory suggested that the adoption process of new products were via opinion leaders' spread of using/purchasing experiences, regarding to their knowledge/expertise in field [37,39]. According to the literature, opinion leaders were defined as individuals who are regarded by a group or people as experts for appropriate sources for information [50]. This argument could be further strengthened from the conformity theory perspective, which suggested that consumers tend to actively search for information from opinion leaders with the appropriate expertise, as the source of their informational interpersonal influence [26,39]. Thus, adopting the diffusion of innovation perspective and conformity theory perspective, green viral communication behavior from opinion leaders may have significant impacts on followers' susceptibility to informational interpersonal influences. Based on this and the preceding arguments, the following hypothesis was formulated:

*Hypothesis 2 (H2): In the green context, opinion leaders' green viral communications behavior has significant impacts on consumers' informational interpersonal influences.*

### *3.3. The Positive Effect of Green Viral Communication on Green Purchase Intention*

Literature suggested that viral communication behavior from opinion leaders was a major determinant of consumer purchase intentions [24,43]. An empirical study that examined college students' evaluations on air conditioner purchase decisions indicated that consumers' evaluation of a product was susceptible to the effects from viral communications [51]. Following this vein, viral communication behaviors from opinion leaders is an antecedent of consumers' purchase intentions.

Green marketing literature indicated that consumers' green concerns were a major determinant of green purchase intentions [14]. Companies should proactively engage in green management practices and deliver green images to consumers, since consumers could perceive those efforts and would be more willing to share the information with others [16,19]. This argument could be further strengthened from the diffusion of innovation perspective [22], if opinion leaders or early adopters of green products perceive the green efforts by the companies, it is likely that opinion leaders of green products would spread positive comments or purchasing experiences to the followers. Literature suggested that opinion leaders have the tendency to engage in information sharing [39,50], and further influence followers' decision-making [39]. In summary, it is likely that green viral communication from opinion leaders

would leads to consumers' green purchase intentions. Based on the above rationale, and supporting empirical results, the following hypothesis was developed:

*Hypothesis 3 (H3): In the green context, opinion leaders' green viral communications behaviors have positive impacts on consumers' green purchase intentions.*

### *3.4. The Positive Effect of Normative Interpersonal Influences on Green Purchase Intentions*

Katz and Lazarsfeld suggested that consumers seek advices of products to fulfill the desire to enter a group or to enhance the relationship with the group. This kind of behavior is known as opinion seeking behavior [24,52]. Opinion seeking behavior implicitly suggested that consumers want to understand a group's norms and values in order to comply with its beliefs. [39]. Flynn *et al.* (1996) furthermore suggested that opinion-seeking behavior can be analyzed as a socialization process [52]. Through the socialization and communication process on the products, opinion seekers could be persuaded to create or strengthen their bonds with the group and eventually they would become implicitly receptive to normative influences [39]. This argument is further strengthened by empirical evidence suggesting that interpersonal influences could influence on consumers' purchase decisions [27,44,53].

From the green perspective, similar results were supported by the literature. For example, Hopper and Nielsen (1991) indicated that the social norm, referred to as how others think one should behave, influenced peoples' recycling behavior [54]. Furthermore, Granzin and Olsen (1991) found that seeking for group identity and interpersonal influence were antecedents of green behaviors such as recycling, donating for reuse, and conserving energy [55]. Thus, green consumers who seek for green group's identification could show their willingness to purchase green products as a signal that they want to conform to the societal standards set by the green group they wish to belong. Based on this rationale, the following hypothesis was suggested:

*Hypothesis 4 (H4): In the green context, normative interpersonal influences have significant impacts on green purchase intentions.*

### *3.5. The Positive Effect of Informational Interpersonal Influence on Green Purchase Intention*

Green marketing literature suggested that green products are usually expensive [56], and consumers are often confused about the environmental labels on green products [57]. Thus, green consumers would be motivated to continually obtain green information/knowledge from various sources to make the optimal purchase decisions. This argument is supported by the study by Vining and Ebreo (1990), which showed that those who were more committed to green behaviors, such as recycling, were more likely than others to turn to friends of or information about environmental protection [58]. This is more important in the green era since few companies try to deceive consumers by over-exaggerate the environmental performance of their green products/services [59]. From the theory of innovation diffusion perspective, Flynn *et al.* (1996) suggested that opinion seeking satisfies the need that to improve the product choice and to reduce perceived risk [52]. Feick *et al.* (1986) mentioned that opinion seekers collect information or opinions from interpersonal sources in order to evaluate products and make purchase decisions [60]. Consumers' main concern is to make the right choice from a variety of product or brand evaluations. When opinion seekers ask for advice, they place themselves in a position

of accepting informational influence [61]. Thus, in the green context, informational interpersonal influence is likely to impact on green consumers' purchase intentions.

In addition, the conformity theory suggested that suggest that people accumulate informational sources via from experts in the field or by observing others' behaviors [26]. Evidence suggested that informational interpersonal influences could affect consumer decision processes regarding product evaluations [60], product selections [27], and purchase decisions [62]. Thus, it is highly likely that in the green context, green consumers are relying green experts or opinion leaders' information to purchase green products. Given this reasoning, the following hypothesis was suggested:

*Hypothesis 5 (H5): In the green context, informational interpersonal influence has a significant impact on green purchase intention.*

## 4. Methodology and Measurement

### 4.1. Questionnaire Design

The unit of analysis in this study is individual level. A self-administered questionnaire was developed for this study to verify the hypotheses and research framework proposed above. All variables in this study were measured by scalable items adapted from previous studies, and the content of questionnaire items were revised properly. The questionnaire was consisted of five sections: green viral communication, perceived informational interpersonal influence and perceived normative interpersonal influence, green purchase intentions, and demographic information. The descriptive information for each construct utilized in this study is reported in Table 1. In sections one through four, each respondent was asked to consider a Green product/brand that he or she had used most recently within sixth months. This approach ensured that the respondent had both knowledge and experience of the green product/brand they were evaluating. Following prior study [16], section one was designed to identify the respondent's perceptions of green viral communication with the green product/brand on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). In a similar vein, section two and three were designed to capture normative interpersonal influence and informational interpersonal influence, regarding the respondents' experience at the green product/service. The questionnaire items were developed based on previous research [27], but modified to fit green situations. All items were measured on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Section four was designed to examine green consumers' purchase intentions regarding their experiences at the Green product/brand. The measurement items were slightly modified from Chen and Chang [31]. Finally, Section 5 of the questionnaire included demographic data, such as age, gender, level of education and occupation, purchase experience, *etc.*

Before the questionnaire was distributed, several academic professionals in the field and the subject of this study were invited to review the questionnaire, to assure content validity. Minor revisions were adjusted based on their suggestions. Subsequently, a pre-study was conducted to ensure the reliability of each construct, using a convenience sample of 40 students at a private university in Taiwan. The reliability of the measurements was well above the suggested cutoff of 0.70 [63], indicating internal consistency [64]. In addition, the wording of the questionnaires was slightly modified based on respondents' feedback.



#### 4.2. Data Collection and the Sample Profile

Since the definition of green consumption consists of broad and divergent consumer behaviors [45], this study thus focus on green detergent users because according to Gilg *et al.* [45], green detergents were listed as one of the most frequently purchased green products by green consumers. A web-based survey was conducted in Taiwan, with the assistance of a marketing research company. The company helped to upload to contents of the questionnaire online and designed a web link that enables respondents to fulfill the questionnaire online. The company then distributed the survey questionnaire to their members via emails to ask for their assistance. Each respondent received a cover letter that explained the purposes of this research and was guaranteed the anonymous to erase privacy concerns. The survey period was two months and eventually 596 samples were collected. Among the sample, those who filled the questionnaire but did not have actual purchase experience before were dropped from further analysis. Eventually, this study received 338 valid samples in return. Demographic information about the sample for this study showed that 31.9 percent were male and 68.1 percent were female. The majority of respondents were below 30 years old (75.6%). About 76.1 % respondents were single, while 20.0% of consumers were married. The education profile indicates that 78.1% respondents have college degrees and 15.6% have master's degrees. Thus, this study concludes that young, unmarried females with college diplomas composed the majority of the sample. Detailed descriptive statistics are displayed in Table 1.

**Table 1.** Demographic characteristic of respondents.

Characteristic	Frequency	Percentage	CF (percent)
<i>Age</i>			
19 or under	110	32.5	32.5
20–29	147	43.5	76.0
30–39	39	11.5	87.6
40–49	24	7.1	94.7
50–59	18	5.3	100.0
Above 60	0	0	100
<i>Gender</i>			
Male	107	31.7	31.7
Female	231	68.3	100.0
<i>Monthly income</i>			
Under \$700	218	64.5	64.5
\$701–\$ 1300	65	19.2	83.7
\$1301–\$2000	34	10.1	93.8
\$2001–\$2700	8	2.4	96.2
Above \$2701	13	3.8	100.0
<i>Education</i>			
High school	18	5.3	6.4
Bachelor's degree	268	79.3	84.4
Postgraduate and above	52	15.4	100.0

### 4.3. Definitions and Measurements of the Constructs

#### 4.3.1. Green Viral Communications Scale

This study refers to prior study by defining “green viral communication” as “the extent of to which a customer would infer friends, relatives, and colleagues about positive environmental messages of a product or a brand” [16]. In operationalization, this study modifies from the study by Jalilvand and Neda (2012) to measure green viral communication and its measurement includes six items [43]:

- \* (GVC1): *I often read other consumers’ green product reviews to know what green products/brands make good impressions on others.*
- \* (GVC2): *To make sure I buy the right green product/brand, I often read other consumers’ green product reviews.*
- \* (GVC3): *I often consult other green consumers’ product reviews to help choose the right green product/brand.*
- \* (GVC4): *I frequently gather information from consumers’ green product reviews before I buy a certain green product/brand.*
- \* (GVC5): *If I don’t read consumers’ product reviews when I buy a green product/brand, I worry about my decision.*
- \* (GVC6): *When I buy a green product/brand, consumers’ product reviews make me confident in purchasing the green product/brand.*

#### 4.3.2. Informational Interpersonal Influences Scale

This study follows Deutsch and Gerard (1955) to define informational conformity behavior as “the tendency to accept information from others as evidence about reality” [23]. In operationalization, this paper modifies the study by Bearden *et al.* (1989) to measure normative conformity behavior [27]. The measurement includes the following four items:

- \* (III1): *To make sure I buy the right green product or brand, I often observe what others are buying and using.*
- \* (III2): *If I have little experience with a product, I often ask my friends about the product.*
- \* (III3): *I often consult other people to help choose the best alternative available from a green product class.*
- \* (III4): *I frequently gather information from friends or family about a green product before I buy.*

#### 4.3.3. Normative Interpersonal Influences Scale

Following prior study, Normative interpersonal influence is defined as “the tendency to conform to the expectations of others” [25]. In operationalization, this paper modifies the study by Bearden *et al.* (1989) to measure normative interpersonal influence. The measurement includes the following items:

- \* (NII1): *I rarely purchase Green products until I am sure my friends approve of them.*
- \* (NII2): *It is important that others like the green products that I buy.*

- \* (NII3): *When buying green products, I generally purchase those green brands that I think others will approve of.*
- \* (NII4): *If other people can see me using a green product, I often purchase the green brand they expect me to buy.*
- \* (NII5): *I like to know what green brands and products make good impressions on others.*
- \* (NII6): *If I want to be like someone, I often try to buy the same green brands that they buy.*
- \* (NII7): *I often identify with other people by purchasing the same green products and brands they purchase.*

#### 4.3.4. Green Purchase Intentions Scale

In this study, “Green purchase intentions” is defined as “the likelihood that a consumer would buy a particular product resulting from his or her environmental needs” [13]. In operationalization, this study refers to previous studies to measure green purchase intentions [65,66]:

- \* (GPI1): *I intend to purchase this product because of its environmental concern.*
- \* (GPI2): *I expect to purchase this product in the future because of its environmental performance.*
- \* (GPI3): *Overall, I am glad to purchase this product because it is environmental friendly.*
- \* (GPI4): *I expect to purchase this green product/brand in the next three months.*

## 5. Empirical results

### 5.1. Measure Reliability and Validity

Following prior study, the scales were examined using exploratory factor analysis (EFA) to identify poorly fitting items and then confirmatory factor analysis (CFA) for further measure purification [67]. The criteria for acceptable psychometric properties require that (1) loadings in a confirmatory factor analysis (CFA) exceed 0.70; (2) loadings are greater than cross-loadings [68]. One item (*i.e.*, GVC6) within the Green-viral communication scale (“When I buy a green product/brand, consumers’ product reviews make me confident in purchasing the green product/brand.”) was removed from the scale because it did not conform to the uni-dimensionality requirements. In addition, two items (*i.e.*, NII3, GPI4) were eliminated from the analysis because their loadings were below 0.70.

CFA results for the final items are presented in Tables 2 and 3. As can be seen from Table 3, all items exceed the 0.70 loading criterion. To assess discriminant validity of each scale, two criteria need to be met. First, indicators should load more strongly on their corresponding construct than on other constructs in the model. The data in Table 3 indicates that loadings of items on their respective constructs were higher than cross-loadings of the items on other constructs. Second, the square root of the average variance extracted (AVE) (leading diagonal in Table 4) should be larger than the inter-construct correlations, which implies that all constructs share more variance with their indicators than with other constructs. Since both criteria were met, it is thus concluded that the constructs exhibit adequate discriminant validity.

**Table 2.** Factor analysis of this study.

Constructs	Number of items	Number of factors	Accumulated percentage of explained variance
A. Green word-of-mouth communication	5	1	19.14
B. Normative interpersonal influence	6	1	36.27
C. Informational interpersonal influence	4	1	53.15
D. Green purchase intention	3	1	67.07

**Table 3.** Confirmatory Factor Analysis.

	1	2	3	4
GVC1	0.154	0.753	−0.002	0.243
GVC2	0.12	0.783	0.149	0.071
GVC3	0.129	0.834	0.086	0.017
GVC4	0.169	0.758	0.218	0.085
GVC5	−0.029	0.631	0.403	0.026
NII1	0.74	0.072	0.055	−0.008
NII2	0.715	0.219	−0.01	0.003
NII4	0.692	0.156	0.11	0.247
NII5	0.683	0.125	0.24	0.056
NII6	0.786	0.036	0.159	−0.072
NII7	0.774	0.008	0.153	0.12
III1	0.254	0.164	0.69	0.14
III2	0.064	0.126	0.857	0.102
III3	0.136	0.194	0.844	0.138
III4	0.201	0.141	0.84	0.054
GPI1	0.067	0.164	0.105	0.875
GPI2	0.07	0.09	0.072	0.891
GPI3	0.057	0.072	0.184	0.86

GVC = Green viral communication; NII = Normative Interpersonal Influence; III = Informational Interpersonal Influence; GPI = Green Purchase Intention.

**Table 4.** Correlation among constructs and the square root of average variance extracted.

Constructs	Mean	S.D.	A	B	C	D
A. Green Viral Communication	3.44	0.70	0.73			
B. Informational Interpersonal Influence	3.10	0.74	0.307 *	0.7		
C. Normative Interpersonal Influence	3.65	0.72	0.416 *	0.362 *	0.8	
D. Green Purchase Intension	3.92	0.71	0.266 *	0.182 *	0.280 *	0.84

Note: \*  $p < 0.1$ . Diagonal elements in the correlation of constructs matrix are the square root of the average variance extracted. For adequate discriminant validity, diagonal elements should be greater than corresponding off-diagonal elements.

**Table 5.** Psychometric properties of measures.

Construct	Items	Standardized factor loading	Cronbach's alpha	Average variance extracted	The square root of AVE
A. Green Viral Communication	GVC1	0.70	0.845	0.531	0.729
	GVC2	0.74			
	GVC3	0.79			
	GVC4	0.78			
	GVC5	0.62			
B. Normative Interpersonal Influence	NII1	0.65	0.846	0.480	0.692
	NII2	0.65			
	NII4	0.68			
	NII5	0.69			
	NII6	0.74			
	NII7	0.75			
C. Informational Interpersonal Influence	III1	0.69	0.876	0.645	0.803
	III2	0.80			
	III3	0.87			
	III4	0.85			
D. Green Purchase Intention	GPI1	0.85	0.877	0.71	0.843
	GPI2	0.86			
	GPI3	0.81			

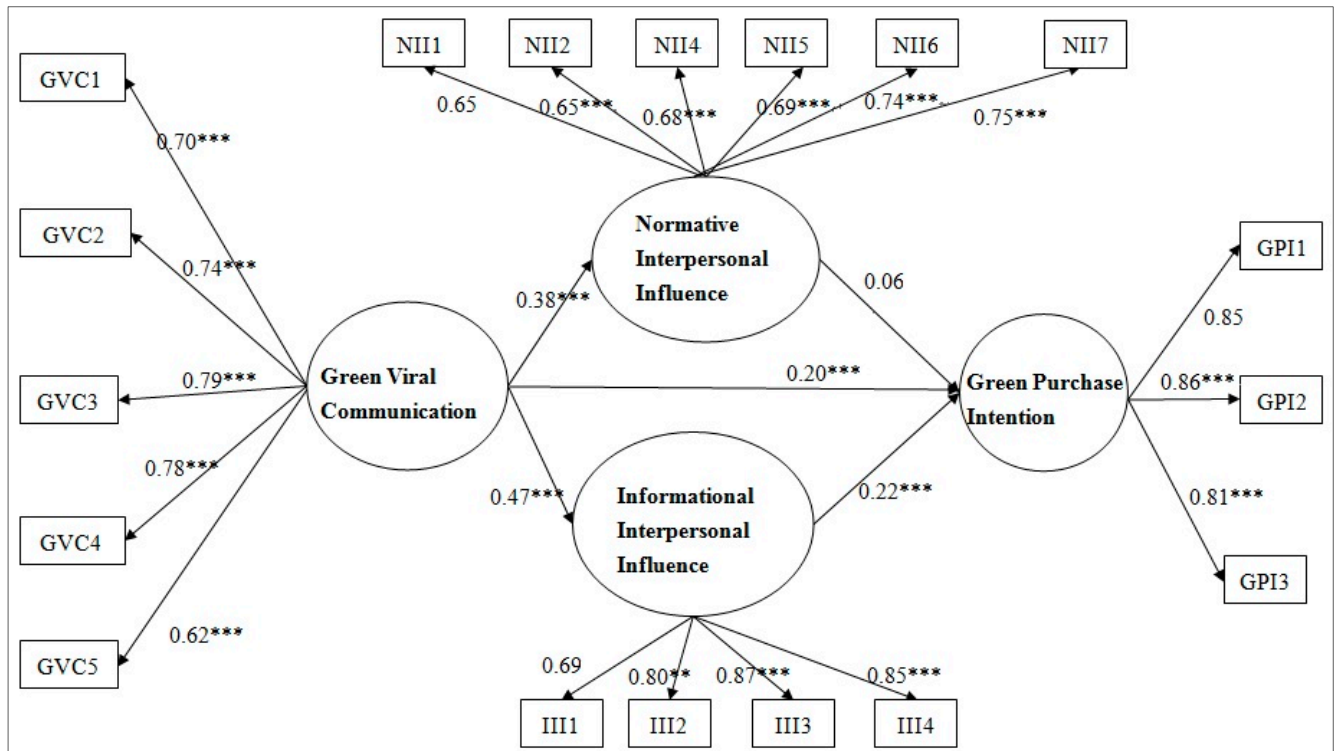
In addition, convergent validity was assessed by two criteria [69]: (1) all indicator loadings should be significant and exceed 0.5; and (2) the average variance extracted (AVE) by each construct should exceed the variance due to the measurement error for that construct (*i.e.*, AVE should exceed 0.50). As shown in Table 3, all of the items exhibit a loading higher or closer to 0.5 on their respective construct, and as shown in Table 5, all of the AVEs ranged from 0.48 to 0.71, thus satisfying both conditions for convergent validity.

This study used Cronbach's  $\alpha$  coefficient to analyze the reliability of each scale [63]. The empirical results in Table 5 suggest that the Cronbach's  $\alpha$  coefficient of each variable was higher than 0.7, as suggested by Nunnally [64]. Thus, the items in each scale have good internal consistency. Overall, these measurement results are satisfactory and suggest that it is appropriate to proceed with the evaluation of the structural model.

## 5.2. Structural Model

SEM was applied to analyze the overall model and tests the hypotheses proposed [68]. The overall model fit measures were used to evaluate the fit of the structural model. The  $\chi^2$  test was used to estimate the goodness-of-fit indices (GFI) for measurement and structural models. In addition, the root mean

square error of approximation (RMSEA) was also examined as an absolute fit index. The incremental fit index (IFI), and the comparative fit index (CFI) were used as incremental fit indices. Standardized estimates were used in reporting the causal relationships between the exogenous and endogenous constructs. Figure 2 indicates the overall explanatory power, the standardized path regression coefficients that indicate the direct influences of the predictor upon the predicted latent constructs for the model.



**Figure 2.** Standardized regression coefficients proposed model. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The model fit indices of the structural model and the cut-off value of those fit indices are presented in Table 6. In Table 6, the goodness-of fit statistics show that the structural model fit the data reasonably well. Table 6 presents the results of the individual tests of the significance of the relationship among the variables. Among the five casual relationships tested, one was found to be insignificant (*i.e.*, H4), and the other relationships were found to be significant at the level of 0.01. Green viral communication had a significantly positive impact on perceived normative interpersonal influence ( $\beta = 0.38$ ,  $t = 5.72$  and  $p < 0.01$ ), indicating that consumers' green viral communication was an important antecedent of perceived normative interpersonal influence. Green viral communication also had a strong positive effect on perceived informational interpersonal influence ( $\beta = 0.47$ ,  $t = 7.25$  and  $p < 0.01$ ). In addition, Green viral communication had a strong positive effect on green purchase intention ( $\beta = 0.20$ ,  $t = 2.41$  and  $p < 0.01$ ). These results suggest that compared to other promotional media, green-viral communication plays a major role as an important antecedent of green customer's behavioral intention. Furthermore, informational interpersonal influences influenced green purchase intention ( $\beta = 0.20$ ,  $t = 2.82$  and  $p < 0.01$ ), indicating that informational interpersonal influence was an antecedent of green purchase intention. However, the relationship between normative interpersonal influence and green purchase

intentions is insignificant ( $\beta = 0.07$ ,  $t = 0.98$ ). The statistical results, summarized in Table 7, generated five major findings:

- (1) Green viral communication has a positive impact on normative interpersonal influence.
- (2) Green viral communication has a strong positive impact on informational interpersonal influence.
- (3) Green viral communication has a strong positive impact on green purchase intention.
- (4) Normative interpersonal influence does not have a significant impact on green purchase intention.
- (5) Informational interpersonal influence has a positive impact on green purchase intention.

**Table 6.** Model fit statistics.

Structural model	Fit statistics	Cut-off value
$\chi^2$	357	
df	130	
<i>p</i> -value	0	< 0.05
GFI	0.90	0.9
IFI	0.96	0.9
NFI	0.93	0.9
CFI	0.96	0.9
RMSEA	0.07	0.08

**Table 7.** The results of the structural model.

Hypothesis	Proposed effect	Path coefficient	Results
H1	+	0.38 ***	H1 is supported
H2	+	0.47 ***	H2 is supported
H3	+	0.20 ***	H3 is supported
H4	+	0.06	H4 is NOT supported
H5	+	0.22 ***	H5 is supported

Notes: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 6. Conclusions and Implications

The starting point of this paper was the observation that opinion leaders of green consumer communities can spread their green product/brand purchase experience and the adoption of green consumption will become increasingly popular. Practical experience suggested that in a green context, opinion leaders or early adopters of green products are especially interested in writing and reading pleasant and unpleasant experiences. Consequently, the question arose of what effects green viral communication behavior from opinion leaders might have on response variables that are relevant in the green marketing field. Two sets of variables that played important roles in marketing research, but have not been considered in the green context yet, are the effects of viral communications behaviors from opinion leaders of green products and green consumer's susceptibility to interpersonal influences. Therefore, it stood to reason to extend the existing body of research in the field of the Theory of Innovation Diffusion and Conformity Theory in the green context and examining possible casual relationships. This research builds on prior studies and explores the unique contributions of viral communication behavior and interpersonal influences on green purchase intentions.

The empirical results indicated that green viral communication behavior of opinion leaders has positive effects on green consumers' susceptibility to informational interpersonal influences, and consumers' susceptibility to normative interpersonal influences. The empirical results also indicated that green viral communication behavior of opinion leaders has a positive direct effect on consumers' green purchase intentions. The relationship between viral communications behaviors and purchase intentions has been established by numerous studies prior this study, but none have examined it in the green context. In addition, the findings suggested that the impact of informational interpersonal influences is significant on purchase intention, while interestingly, the impact of normative interpersonal influences is on green purchase intentions was insignificant.

### 6.1. Theoretical Contributions

The primary insight derived from this study is about the significantly influence of green viral communications and interpersonal influences on green purchase intentions in a green marketing context. One of the important theoretical contributions of this study is incorporating the theory of innovation diffusion perspective into the green marketing literature. Prior studies have tried to interpret the green consumption from different perspectives, but none have explained the green consumption from the two perspectives. In addition, the interpersonal influence scale that Bearden *et al.* [27] developed has been widely validated within the marketing and consumer behavior field, but its application to other context has been limited. This study provides added empirical support to the inter-discipline stability of the scale by testing the scale in a context of green consumption. This study also responds to the calls for additional research on green consumption [20] and, is the first to empirically support the arguments regarding the impact of green viral communications, interpersonal influences, and green purchase intentions.

### 6.2. Managerial Implications

The findings generated from this study are worthy of attention in terms of their managerial implications. First, few companies marketed their green products by means of deceptive green claims and over-exaggerate the environmental performance of their green products/services [58], which resulted in low green purchase intentions [70]. The finding that green viral communication behavior from opinion leaders can lead to green purchase intentions is particularly important for green marketers. This study provides directions for green marketers to develop meaningful communication tools to make opinion leaders or early adopter of green products more knowledgeable about specific green product or brand characteristics and tries to change some of the negative associations that consumers have about the product/brand through green viral communication behaviors. Thus, it is important to say that green viral communication behaviors from opinion leaders play an important role in increasing consumers' green purchase intentions.

Second, as companies spend a significant part of their revenues on enhancing green purchase intentions, the findings of this study indicate that such investment if directed towards on green consumers' susceptibility to informational interpersonal influences would accompany increased product sales. The finding that informational interpersonal influences mediates the relationship between green viral communication and green purchase intentions could inspire green marketers to increase the amount of money on information spread, such as subsidizing or sponsoring opinion leaders' blogs, or websites.



These avenues of relevant objective information help consumers rely heavily on informational interpersonal influences, which could increase the flows on green blogs, green websites, or other green informational tools of opinion leaders. As a result, it could be expected that the amount of sales of green products will also be on the rise.

Third, this study further affirms the need for green marketers to understand green consumers' differences with traditional consumers when marketing green products/brands. Green marketers should be aware that although the viral communication behavior from opinion leaders could stimulate green consumers' desire to conform to the societal standards set by the green group they wish to belong, it would not help to increase the sales of green products. This could be explained as although green consumers wish to conform themselves into the green groups, their purchase decisions are rather independent from normative interpersonal influences. Other product attributes such as environmental attributes could place a more important role in green consumers' purchase decisions.

Last, prior study reported that in the presence of other people, consumers make different behavioral choices from those they would have made by themselves [71]. Ratner and Kahn (2002) explained the motive behind this behavior is rooted in the desire to impress other people [72]. The findings of the insignificant relationship between normative interpersonal influences and green purchase intentions suggested that unlike their counterparts, green consumers might not want to impress others so much. Thus, green marketers could try to spend less marketing budget on the design of the green products packages since green consumers tend to not impress others.

## **7. Limitations and Directions for Future Research**

As with any research, there were a number of limitations in this study. First, because only green detergent users in Taiwan responded to the survey, the findings have limited generalizability to other product categories. Second, since this study used a web-based survey, the responses about actual using or purchasing experiences could have some bias compared with conducting on-site surveys. The respondents had to depend on their memories of using experiences to respond to questions. Although this method is convenient and prevail in online surveys for consumer research, it might be somewhat difficult for respondents to respond to the questions based on their memory. Third, future efforts should use a variety of qualitative methodologies (e.g., interviews, qualitative methods) to triangulate the results. Since green viral communication, susceptibility to interpersonal influences and green purchase intentions are not necessarily static, longitudinal studies that examine how the impact of green viral communication and susceptibility to interpersonal influences evolves with respect to green purchase intentions would provide additional insights into the phenomenon. Finally, this study provides a general framework and sets the stage for future research that could explore the relevance of other external and internal factors to broaden the examination of green purchase intentions.

## **Conflicts of Interest**

The author declares no conflict of interest.

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