



# Using Push Technology to Discover Factors Influencing Consumers' Intention to Purchase Greenwashed Products

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**Abstract.** Companies are adopting green marketing strategies as consumers are looking to purchase green products due to growing concerns for the environment. However, to gain market share, some firms opt to greenwash in advertisements. This is when claims regarding green performance outweigh the substantive truth. Underpinned by the attitude-behaviour-context theory, this study examines the relationship between greenwashing perceptions, green purchasing intentions and green advertising skepticism. In order to effectively collect the questionnaires from users, this study uses push technology as the medium for sending the questionnaires which yielded 247 respondents across Asia, Europe, and North America. The results show that green-washing perceptions significantly negatively affect green purchasing intentions and positively affect green advertising skepticism. Also, green advertising skepticism significantly negatively affect green purchasing intentions. These findings add theoretical value to the under-explored relationship between greenwashing perceptions and green consumer purchasing behaviours. It also provides substantive globalized evidence for companies showing that greenwashing in advertising has detrimental effects on product sales.

**Keywords:** Green marketing · Greenwashing perceptions · Green purchase intentions · Green advertising skepticism · Push technology

## 1 Introduction and Literature Review

Over the past 30 to 40 years there has been a growing concern towards the environment. Initially, this consideration came from developed western countries yet more recently the same thought process is proclaimed in developing nations due to the increased environmental damage caused by rapid industrialization. Governments and national bodies are imposing stricter laws to ensure sustainability of the planet. Being environmentally

friendly truly has become a global issue. There is emphatic growing evidence in multiple sectors that showcase this change: government, energy, tourism, product packaging, clothing and slow fashion, organic food, architecture and green building design to name just a few [1]. Consumer's also care about the environment with environmental consideration and sustainability contribution along with personal and health benefits a key indication of their keenness to purchase green products [2, 3]. Indeed, early research shows consumers want to purchase environmentally friendly products [4]. As such, some companies have adapted towards green marketing to meet the changing needs of consumers by producing green products instead of traditional or conventional ones which may be more harmful to the environment [5]. Green products have been defined as having less environmental impact compared to traditional products in that they have the ability to be recycled or conserved and are environmentally-friendly as they do not harm the environment or deplete the planet of its natural resources [6].

### **1.1 Greenwashing**

In light of this information some companies have seen the opportunity to implement green business strategies as a model revolved around talking instead of acting [7]. The overcommunication of environmental performance can be construed as greenwashing [8]. Indeed, if a consumer believes or suspects that an organization is promising more environmental benefits than they actually deliver, this application of green marketing can instead be regarded as greenwashing [9]. As the purpose of this study has a particular focus on products, greenwash is defined as when a company misleads a consumer regarding its environmental practices or environmental benefits of a service or product [10]. Precisely, if consumers believe that a company is fulfilling its social responsibility by engaging in environmental activities a consumer would be willing to purchase products from this company even if the price is higher than a traditional product [11]. As such, another definition and use-case for the application of greenwashing is that it can be strategically used to only reveal positive information about environmental performance and omit the negative information in an effort to build up a positive corporate image [12]. Ultimately, not all companies have the correct capabilities to partake in genuine green marketing strategies which allows firms to differentiate their products and seize new green markets via the increased green product demand and green purchasing intentions [13, 14] of consumers who are environmentally concerned [4, 5].

### **1.2 Green Purchasing Intentions**

One definition of green purchasing intentions is the likelihood a consumer will buy a product based upon their environmental views towards that product or service or make purchases towards companies with a perceived reputation of engaging in environmentally friendly behaviours [15, 16]. Indeed, it has been suggested the consumers buy these products as a means to protect, or at least, not destroy the environment [17]. This is an important issue for research as there exists a research gap between the association of greenwashed products on green purchasing intentions; in particular, on the extent to which consumers are willing to buy these services or products [16, 18]. Indeed, it has been suggested the consumers buy these products as a means to protect, or at least,

not destroy the environment [17]. This is an important issue for research as there exists a research gap between the association of greenwashed products on green purchasing intentions; in particular, on the extent to which consumers are willing to buy these services or products [16, 18].

### 1.3 Green Advertising Skepticism

Due to the evidence showcasing the large number of corporations engaging in greenwashing and their reasons for doing so, it is only natural that there has been a growing consumer skepticism towards companies. Skepticism in its most general form is the inclination or tendency of a person to doubt or distrust others [19]. This concept has been researched in the fields of philosophy, politics, psychology and sociology [20, 21]. Whereas business settings research have generally focused on skepticism in general advertising [22], corporate social responsibility [23], cause-related marketing [24] and green advertising [25].

Indeed, as greenwash continues to grow alongside the growth in demand for green products, consumers are paying more attention to it [14]. Studies conducted by GFK (2013) and Eurobarometer (2009) found that 39% and 48% of consumers did not trust the environmental claims of products. A big factor of this growing skepticism has come from the consumer desire to ensure they do not feel an opportune advantage has been taken of them and that the products they purchase are genuinely contributing to the wellbeing of the environment [26, 27].

### 1.4 Reasons for Study

This study looks at consumers on the global level with a primary focus on North American, European, and Asian markets. As such, this paper can offer generalized results on global green purchasing behaviours and understandings of perceived ability to identify greenwashed adverts. Overall, the findings of this study are expected to contribute to green marketing as a whole, particularly in the backpack product industry, aiding companies and consumers alike in understanding causes and consequences of green purchasing intentions in greenwashed situations.

## 2 Hypothesis Formulation and Research Framework

### 2.1 Theoretical Support

The research framework is illustrated in Fig. 1. This paper chose to underpin its theoretical explanations of behaviour using the attitude-behaviour-context (ABC) theory [28]. The theory operates by taking a means-end approach effect where a person behaves according to the gains they expect from that behaviour [29]. The framework has been useful in explaining how attitudes result in certain behaviors. In particular, past studies have shown the relationships between greenwashing perceptions or green skepticism and green purchasing intentions [3, 30]. Attitude is at the center of attempts to predict behaviour and attempt to explain it [31] and is understood as the evaluative rating of

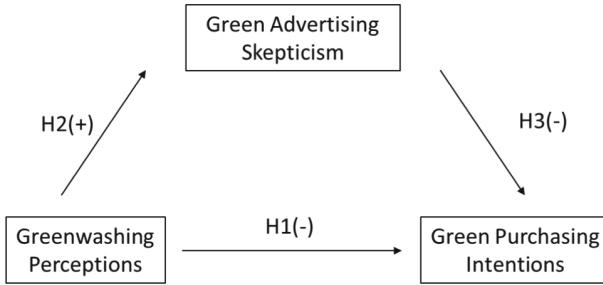


Fig. 1. Research model

an object, which consists of beliefs, perceptions and the evaluation of outcomes [28]. However, attitude alone does not guarantee a behaviour, as behaviours are dependent on contextual factors such as availability, costs, societal trends and personal relationships [29].

### 2.2 Greenwashing Perception and Green Purchasing Intention

Greenwash occurs when a company misleads a consumer regarding its environmental practices or environmental benefits of a service or product [10]. Greenwashing perception is consumers’ ability to identify greenwashing [32]. When a consumer recognizes a companies’ increased communication regarding the environment which is coupled with an inaction to support those claims, they are discouraged from purchasing the companies products [32].

In consumer sectors, up-to-date research has shown a significant indirect negative relationship between greenwashing perception and green purchasing intention [4, 33] as well as a significant direct negative relationship [26, 30, 34]. As such, this research hypothesizes:

H1: Greenwashing perception has a significant negative impact on green purchase intention.

### 2.3 Greenwashing Perception and Green Advertising Skepticism

Green skepticism is when a consumer doubts or distrusts the environmental performance or benefits of a green product [22, 35]. Evidence shows that green skepticism can arise from products being mislabeled, misinterpreted, misrepresented, or questionably certified - which are all forms of greenwashing. They all showed a significant positive relationship, meaning that greenwashing perception leads to green advertising skepticism in consumers [1, 26]. As such, it is hypothesized:

H2: Greenwashing perception has a significant positive relationship on green advertising skepticism.

## 2.4 Green Advertising Skepticism and Green Purchasing Intention

Green advertising skepticism can be understood as consumers' cynicism towards misleading or exaggerated claims found in green advertisements [36, 37]. This can be understood as a negative cognitive component of attitude towards green product advertising [35, 38]. When a consumer doubts the environmental quality of a product they evaluate them less favourably compared to when they have no such doubt [5]. Goh and Balaji [3] found that green skepticism significantly negatively impacts green purchasing intentions and that this is supported by the mediating effects of environmental concern and subjective environmental knowledge. As such, it is hypothesized:

H3: Green advertising skepticism has a significant negative relationship on green purchasing intentions.

## 3 Methodology and Measurements

### 3.1 Data Collection and the Sample

This research paper used the questionnaire survey method to test its hypotheses. Questionnaire is delivered to phone users using push technology. As major studies in the industry before it, consumer-level was the unit of analysis [4, 30]. A question was asked to assess if the respondent had any prior experience buying green products in the past. If yes, further questions were asked to determine the extent of green purchasing habits. Questions from the survey were derived from established previous research. Ultimately, a closed-ended questionnaire consisting of demographic data (gender, age, ethnicity, education background, occupation, income per month and green purchasing habits) as well as three latent constructs (green advertising skepticism, greenwashing perception, green purchasing intention). All questionnaire items were offered on a 5-point Likert-scale ranging 1 to 5; "strongly disagree" to "strongly agree" and two statement questions offered on a "yes" or "no" answer format.

#### 3.1.1 Introduction of Push Technology

To effectively describe how the respondents responded and to clearly understand the development process, the system environment diagram is shown in Fig. 2. The publisher first developed the preliminary questionnaire based on reference articles and specialists confirmed its feasibility before uploading the questionnaire questions to the database for storage (Green Block). Respondents received and filled out the questionnaire (Red Block), and the results were sent to the data center for downloading and subsequent data analysis by the researcher (Yellow Block).

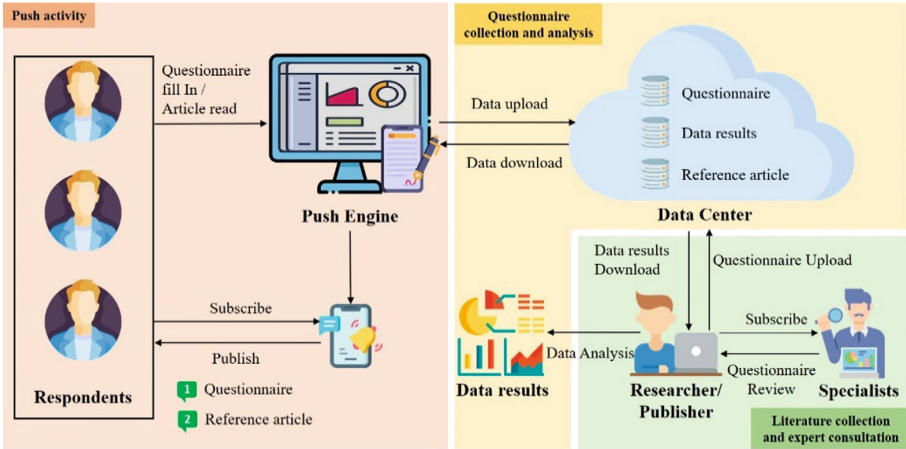


Fig. 2. System environment Framework (Color figure online)

### 3.1.2 The Screenshot of Delivered Content Using Push Technology

As shown in Fig. 3, the system transmits relevant information, including (a) Greenwash articles and related news, (b) questionnaire description, and (c) this survey, through push technology. Respondents subscribe to the system beforehand, and when the system receives new content, it immediately pushes the new content to respondents, and they can view the relevant information.

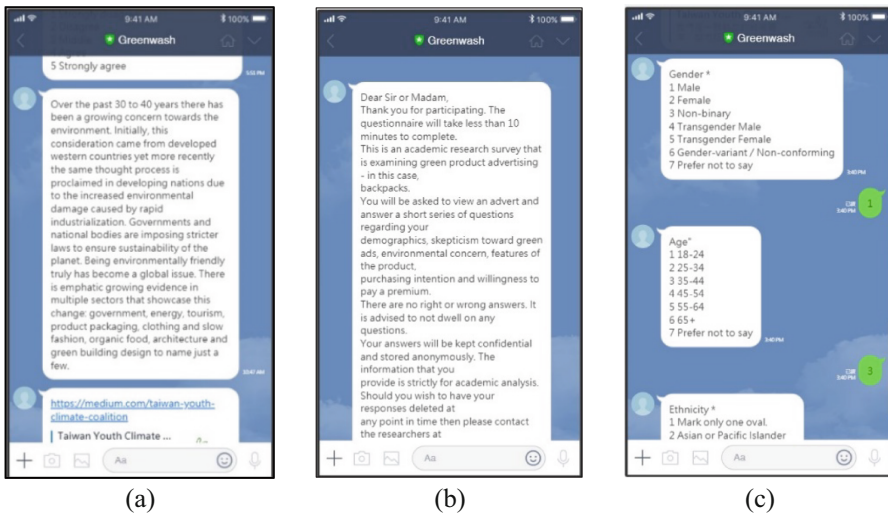


Fig. 3. Content of questionnaire using push technology (Color figure online)

## **3.2 Measurement of Variables**

### **3.2.1 Green Purchasing Habits**

The following section was used to establish green purchasing habits from a demographic perspective. This is not a direct variable. If the answer to question (1) was “no”, they proceeded directly to the next section of the survey. If the answer to question (1) was “yes”, they proceeded to answer four more questions. (1) I have purchased a green product before; (2) I have purchased a green, sustainable, or environmentally friendly backpack before; (3) I frequently buy products which are considered environmentally friendly; (4) I only exclusively purchase green products compared to traditional products; and (5) I inform myself about a product’s environmental impact before purchasing it.

### **3.2.2 Greenwashing Perception**

Greenwash is defined as “the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service” [10]. Five questions are used to measure greenwashing perception. (1) This product misleads with words in its environmental features; (2) this product misleads with visuals or graphics in its environmental features; (3) this product possesses a green claim that is vague or seemingly un-provable; (4) this product overstates or exaggerates how its green functionality actually is; and (5) this product leaves out or masks important information, making the green claim sound better than it is.

### **3.2.3 Green Advertising Skepticism**

Green advertising skepticism is defined as the consumers’ cynicism towards misleading or exaggerated green advertising and its claims [36, 37] as well as the negative cognitive component of consumers’ attitude toward green products and consumers’ tendency not to believe the environmental claims made in advertising [38, 35]. Survey adapted from Wei, Kou, and Lee [39]. (1) Most green claims in advertising are intended to mislead rather than to inform consumers; (2) I do not believe most green claims made in advertising; and (3) I believe green claims in advertising are exaggerated; and (4) Consumers are better off without green advertisements.

### **3.2.4 Green Purchasing Intention**

Green purchasing intention is defined as the likelihood to buy a product or service from a company based upon their reputation for being environmentally friendly [15, 16]. The survey statements were adapted from by Zhang et al. [30], in turn adapted from Abdul-Muhmin [40] and Goh and Balaji [3]. (1) I will purchase this backpack from this company because of its environmental concern; (2) I am willing to buy other backpack products from this company because of its environmental performance; and (3) I am happy to purchase any of the company’s backpack products because they are environmentally friendly.

### 3.2.5 Control Variables

Demographic frequencies are shown in Table 1. Gender was measured and divided into four groups. Age was measured and divided into seven groups. Education was measured and divided into five groups. Income was measured and divided into five groups. Occupation was measured and divided into five groups. Income was measured and divided into seven groups. Green product purchasing behaviours were also measured and divided as a binary dummy variable. Demographic frequencies can be seen in Table 1.

**Table 1.** Demographics.

Gender	N	%
Male	149	60.3
Female	94	38.1
Gender-variant	1	0.4
Prefer not to say	3	1.2
<b>Age</b>		
18–24	59	23.9
25–34	121	49
35–44	33	13.4
45–54	15	6.1
55–64	8	3.2
65+	10	4
Prefer not to say	1	0.4
<b>Education</b>		
High school	23	9.3
Bachelor	133	53.8
Master	78	31.6
Doctorate	8	3.2
Prefer not to say	5	2
<b>Occupation</b>		
Student	51	20.6
Unemployed	15	6.1
Self-employed	37	15
Employed	133	53.8

*(continued)*

**Table 1.** (continued)

Gender	N	%
Retired	11	4.5
<b>Income</b>		
Under \$20,000 NTD	38	15.4
\$20,001–\$45,000 NTD	37	15
\$45,001–\$75,000 NTD	46	18.6
\$75,001–\$100,000 NTD	46	18.6
\$100,001–\$150,000 NTD	14	5.7
\$150,001 + NTD	34	13.8
Prefer not to say	32	13
<b>Purchased a green product before</b>		
No	58	23.5
Yes	189	76.5

## 4 Results

### 4.1 Reliability and Validity

This study examines the reliability of the constructs by examining Cronbach's alpha coefficients. As shown in Table 2, the Cronbach's alpha coefficient of green advertising skepticism, greenwashing perception, and green purchasing intentions are 0.781, 0.870, and 0.865 respectively. They all exceed the minimum level of 0.7, which indicates acceptable reliability and internal consistency.

The factor loading of each variable is above the recommended 0.6 threshold, showing acceptable structure validity of the measurements. To assess the discriminant validity the measurement of Average Variance Extracted (AVE) is used. As shown in Table 2, the square root of all construct's AVEs are higher than the correlations among all the constructs which shows the acceptance of the discriminant validity of the measurement. Additionally, the AVEs of green advertising skepticism, greenwashing perception and green purchasing intentions are 0.553, 0.606, 0.687, respectively. They all exceed the minimum level of 0.5, which indicates that the convergent validity of the measurement is acceptable.

**Table 2.** Validity.

Constructs	Items	Loadings	AVE	CR	Cronbach's Alpha	SQRT AVE
Green Advertising Skepticism	GAS1	0.8093	0.553	0.829	0.781	0.91
	GAS2	0.8216				

(continued)

**Table 2.** (continued)

Constructs	Items	Loadings	AVE	CR	Cronbach's Alpha	SQRT AVE
	GAS3	0.7683				
	GAS4	0.5409				
Greenwashing Perceptions	GWP1	0.8211	0.606	0.885	0.870	0.94
	GWP2	0.7874				
	GWP3	0.7750				
	GWP4	0.7832				
	GWP5	0.7228				
Green Purchasing Intentions	GPI1	0.8116	0.687	0.868	0.865	0.93
	GPI2	0.8445				
	GPI3	0.8300				

**4.2 Correlation Analysis**

The means, standard deviations and correlation matrix are calculated which can be seen in Table 3. The data suggests that greenwashing perception is significantly negatively correlated with green purchasing intentions ( $p < 0.01$ ). Green advertising skepticism is significantly positively correlated with greenwashing perception ( $p < 0.01$ ) and significantly negatively correlated with green purchasing intentions ( $p < 0.01$ ).

**Table 3.** Descriptive statistics and correlation analysis

		Correlations				
No.	Variables	Mean	SD	1	2	3
1	Green Advertising Skepticism	2.98	0.80	1		
2	Greenwashing Perception	3.18	0.88	.48**	1	
3	Green Purchasing Intention	2.85	0.93	-.23**	-.38**	1
Note:	** Correlation is significant at the 0.01 level (2-tailed)					
	* Correlation is significant at the 0.05 level (2-tailed)					

**4.3 Hypothesis Testing**

Initially, multiple linear regression was used to assess the research question. Tests were conducted to evaluate the prediction of the dependent variable, green purchasing intentions, from the independent variables, greenwashing perceptions, and green advertising

skepticism. The path of greenwashing perception toward green purchasing intentions was negatively significant ( $B = -0.396$ ,  $t(236) = -6.57$ ,  $p < 0.01$ ,  $R^2 = 0.212$ ). The path of greenwashing perception on green advertising skepticism is positively significant ( $B = 0.463$ ,  $t(236) = 7.924$ ,  $p < 0.01$ ,  $R^2 = 0.259$ ). The path of green advertising skepticism towards green purchasing intentions was negatively significant ( $B = -0.235$ ,  $t(236) = -3.731$ ,  $p < 0.01$ ,  $R^2 = 0.119$ ) (Table 4).

**Table 4.** Outcome of hypotheses.

Hypotheses	Results
H1: Greenwashing perception has a significant negative impact on green purchase intention	Supported
H2: Greenwashing perception has a significant positive relationship on green advertising skepticism	Supported
H3: Green advertising skepticism has a significant negative relationship on green purchasing intentions	Supported

## 5 Conclusion

Although past research has shown that higher greenwashing perceptions lead to lower green purchasing intentions, there has been limited research incorporating green advertising skepticism in an effort to explain this relationship. This research has generated the following findings regarding overall green purchasing intentions and green advertising skepticism in the contexts of greenwashing.

First, we have extended evidence that greenwashing perceptions significantly directly negatively affect green purchasing intentions [26, 30]. In other terms, the more a consumer is able to perceive a product as greenwashed, the less likely they are to purchase it. This is important as it suggests that a consumer who can identify a greenwashed product knows that it is not as beneficial to the environment as is claimed, and therefore chooses to forgo purchasing the, potentially harmful, product. It shows that consumers care about the green quality of the products they purchase.

Second, we found that the more a consumer perceives greenwashing the more skeptical they are towards green advertising. These findings concur with previous research and add more value to a scarcely explored relationship [26, 3]. This suggests that a consumer who is highly skeptical of green advertisements is less likely to have strong purchasing intentions for that green product.

The findings from the direct relationship between green advertising skepticism and green purchasing intentions suggest that higher skepticism results in lower green purchase intentions. As such, it is in a company's best interest to avoid increasing green skepticism towards its adverts as it reduces product judgements, but also to its brand/organization. This can be achieved by implementing believable and truthful green adverts and not participating in greenwashing activities, such as any of the seven greenwashing sins. Indeed, consumers are becoming more aware of greenwashing as the

demand for green products grows which has naturally increased their skepticism and intent to pay attention to foul marketing strategies [14]. Here, it is important to acknowledge that skepticism is not a permanent state and opinions and attitudes can be changed when provided with clear and convincing evidence [35]. Therefore, we recommend that a company disclose all the relevant information pertaining to environmental performance at all marketing interaction steps the consumer experiences (e.g., manufacturing, product packaging, shipping and be clear on their ecommerce website) in order to reach a truthful green position. In sum, the recommendations here should help managers reduce consumer green advertising skepticism on current products and impede further green advertising skepticism on future products.

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