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Model of Perceived Greenwashing and Its Impact on Green Product Purchase Intention

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Abstract

The objective of this research is to explore the structural correlation between perceived greenwashing and the intention to purchase green products. It examines how consumer skepticism intervenes in mitigating the impact of eco-purchase behaviors in the environment of the emerging market. This study applies quantitative empirical methodology to report the results of the survey results carried out in Colombia through the survey questionnaire. The suggested theoretical framework and the hypotheses were tested by means of the Partial Least Squares Structural Equation Modeling (PLS-SEM) method. It was shown that perceived greenwashing positively influences the level of consumer skepticism and decreases the intent to purchase green products. At the same time, it was confirmed that consumer skepticism plays a certain role in the said relationship, hence, environmental false information indirectly influences eco-purchase through causing consumer distrust. Therefore, this study contributes to the sustainable marketing theory since it explains the psychological mechanisms of the impact greenwashing make on consumer trust in developing economies. Furthermore, the findings of the study suggest that in marketing, having authentic businesses is important. For a company to maintain the long-term value of its brand and cope with the skepticism of consumers, it needs to support its environmental claims with relevant certification rather than relying on merely marketing them as being environmentally friendly.

Introduction

The advancement of the global climate crisis and the level of environmental awareness have led to a change in consumer behavior as well as the concept of sustainable consumption. Considering this fact, organizations worldwide have started to apply the principles of environmental, social, and governance (ESG) in their marketing strategy. However, the development of sustainable consumption has also led to the emergence of misleading environmental claims which are otherwise named greenwashing (Chen & Chang, 2012). Greenwashing is understood as the process of fooling the customers about the environmental practices of the organization and the environmental benefits of its products. Although real sustainability efforts of companies are aimed at minimizing the negative impact on the environment and preserving it for future generations, ambiguous green claims undermine the trusts of consumers in the market (Grewal et al., 1998). As for developing countries like Colombia, where the legislation connected with environmental communication is yet to be developed, the existence of ambiguous eco-labels and green claims further complicates the matter.

There is a noticeable gap in the understanding of how greenwashing works, even though there is a growing number of academic articles concerning corporate social responsibility and green marketing. The findings of existing studies present the problem of greenwashing mainly as a reputational threat for companies. There is very little research investigating how people perceive greenwashing and how this perception affects customers' attitudes toward making purchases.

Chen & Chang (2013) when consumers must deal with unproven claims on green products, they are exposed to the phenomenon of cognitive dissonance that leads to the increase of cynicism concerning green marketing. As a result, skepticism towards the misleading advertising practices of companies translates into lower levels of green purchasing of eco-friendly brands. This research aims to demonstrate the importance of studying the relations between the perceptions of greenwashing, the attitudes of individuals toward green marketing practices, and the possibility of purchasing green products (Guo et al., 2017).

This research seeks to develop strategies to bridge existing knowledge gaps by creating and empirically testing a structural equation model that investigates the correlation between perceived greenwashing and the intention to buy green products, analyzing the mediating role of consumer skepticism. The methodology employed is comprised of a quantitative research design focusing on Colombian consumers to fulfill three research objectives. The first objective aims at establishing an understanding of how perceived greenwashing affects consumer skepticism and their intention to buy green goods in an emerging market. The second one focuses on identifying whether the negative impact of greenwashing on purchasing decisions takes place through consumer skepticism. Lastly, the third objective investigates how the specific elements of misleading communication, including unclear statements and claims made on social media, affect consumers' evaluation of corporate social deal authenticity.

This research project provides three major theoretical and managerial contributions in sustainable marketing. From a theoretical standpoint, this study contributes to the literature on sustainable consumer behavior by uniting the signaling theory and attribution theory into a new unified structure. As a result, this paper explains how misleading green signals relate to negative attributions of corporate motives, giving deeper thought on the psychological mechanisms involved into explaining the ongoing gap between consumer intention and behavior about green purchasing. Additionally, by introducing consumer skepticism as a key mediating variable in the structural model, the findings of this research contribute to the existing structural models of trust repairing and brand equity in the context of information asymmetry.

From an empirical and contextual perspective, this study meets the needs for thorough research in sustainability in emerging economies, where most of the recent studies on greenwashing have been conducted in wealthy Western countries with developed regulatory environment and established eco-certification systems. This research enhances the applicability of research findings on greenwashing in practice by providing information from Colombia. It provides a new perspective on consumer attitudes in Latin America, which is important because the levels of institutional trust and the standards of environmental disclosure in this region are different from those in developed countries.

From the managerial and public policy points of view, this article gives insights and implications for brand managers, regulators, and professionals dealing with environmental sustainability issues. For businesspeople, this research underlines the necessity of being authentic in business and warns about

the negative effects that meaningless green marketing can have on organizations when it makes consumers stop buying their products. Environmental regulators and authentic environmental marketers can restore market trust, diminish skepticism, and accelerate the development of sustainable production and consumption practices.

2. Literature Review

This study's theoretical underpinnings consist of the combination of Signaling Theory and Attribution Theory as a theoretical framework for explaining how false environmental claims disturb market communications and influence consumer behavior (Kilbourne & Pickett, 2008). There exists information asymmetry in sustainable marketing because producers know everything about the environmental impact of their products, while consumers can only rely on extrinsic signals, claims, and labels to assess sustainability attributes. Mohr et al. (2001) found that based on Signaling Theory, green marketing messages are signaling intentions from the side of companies trying to reduce information asymmetry and inform about the quality of their products. However, if companies' green signals are considered deceptive, misleading, or vague, a signaling breakdown occurs. As a result, misleading signals create not only more uncertainty, but also cognitive dissonance and makes consumers question the truthfulness of the environmental claims made by such companies (Obermiller & Spangenberg, 1998).

Skarmeas and Leonidou (2013) found that attribution Theory further clarifies the cognitive processes that consumers experience when judging corporate intentions behind green claims. Consumers always attribute corporate behavior as either being the product of possible intrinsic motives, which means that there is a genuine commitment to sustainable behavior, or extrinsic motives, which means that the companies try to make profit by exploiting green market opportunities (Persakis et al., 2025). When companies resort to behaviors that could be regarded as greenwashing by the consumers, which include the use of vague language, uncertified eco-labels, and selective disclosure, consumers would perceive the mentioned behavior as attributable to the extrinsic motives. Such negative attribution influences consumer perspective from benefits assessment to risk mitigation, underpinning the cognitive mechanism that contributed to the brand value erosion because of the misleading environmental communication (Daou et al., 2025).

2.1. Dimensions and Conceptualization of Perceived Greenwashing

Nguyen et al. (2025) found that greenwashing is the practice of misleading consumers about a company's environmental practices or a product's environmental benefits. There are many forms of greenwashing, such as claim greenwashing, which refers to misleading, ambiguous, or unsubstantiated claims, and executional greenwashing, which refers to the strategic use of eco-symbolic visuals, green colors, and eco-labels to create the appearance of being eco-friendly (Senan et al., 2025).

In developing countries, the issue of greenwashing is made worse by weak regulations, a lack of systematic third-party certification, and the growing popularity of online marketing. Social media has become a means for businesses to make multiple eco-statements without being verified. When customers notice the discrepancy between the claims made by a brand and the company's actual behavior, they breach the psychological contract between the company and the consumers (Naderer et al., 2025). Greenwashing is a complex phenomenon that includes ambiguous claims, lack of proper credentials, exaggeration of minor green achievements, and misleading digital marketing (Fella et al., 2024).

2.2. Consumer Skepticism as a Mediating Mechanism

Consumer skepticism can be defined as the tendency of consumers to reveal doubt and disbelief regarding the validity of marketing messages and company statements. As opposed to cynicism, which is an inherent personality characteristic denoting general mistrust, skepticism is a specific cognitive state fostered by external information factors and experience. In the context of sustainable marketing, skepticism can be viewed as a psychological defense mechanism used by consumers to shield themselves from possible fraud and financial exploitation (Zioło et al., 2024).

Research in consumer skepticism indicates that consumers shift from a message processing approach to a critical analysis approach in situations where they are confronted with contradictory or unverifiable environmental information. Santos et al. (2024) reported that skepticism among consumers can be differentiated into two separate categories: informational skepticism (doubt about the authenticity of specific claims) and motives skepticism (untrustworthiness of corporate intentions). Misleading green claims increase the level of both types of skepticism. When consumers experience increased skepticism, they tend to disregard the value of green properties, question how effective products are when it comes to achieving their environmental objectives, and resist persuasion in marketing campaigns (Liao & Wu, 2024).

2.3. Green Product Purchase Intention and the Intention-Behavior Gap

The willingness to purchase green products essentially shows that a person is ready or willing to buy eco-friendly products instead of choosing ordinary ones. Setiawan and Yosephani (2024) argued that even though people care more about ecology nowadays, scientists who work in the field of ecology note that there exists a considerable disconnect between what people think and what they do as far as environmental protection is concerned.

Although other factors of this gap exist: prices, accessibility, and product abilities, that lead to this gap, however, mostly it is greenwashing that becomes a psychological factor, or in other words, a reason for stopping people from purchasing. When it is thought positively and perceived by customers as just another marketing ploy, consumers might be afraid of getting an ineffective product and compromise their chance to buy it. Therefore, even those who care about ecology will not be persuaded to act when

they see a lot of greenwashing, although they would buy usual products of familiar brands (Alghamdi et al., 2024)

The present literature review reveals a significant void in the precise structural mechanisms responsible for the adverse impact of misleading environmental communication on sustainable consumption in developing countries (Ahmed et al., 2024). Even though the existing studies have extensively reported the damaging implications of greenwashing, there is not enough empirical research directed at the impact of greenwashing on consumer doubts and buying intentions in Latam. In this context, the question of the research is as follows: What is the impact of perceived greenwashing on consumers' skepticism and their intention to buy green products in Colombia?

3. Conceptual Model and Hypotheses

Based on the theoretical connections suggested in Signaling Theory and Attribution Theory, the present research develops a structural equation model to consider the influence of perceived greenwashing (GW) on consumer skepticism (ESC) and intention to buy green products (IC). According to the theoretical implication, misleading environmental communications increase the level of consumer skepticism and reduce the desire to purchase green products while consumer skepticism is one of the significant psychological variables acting as a barrier to sustainable buying.

3.1. Greenwashing and Consumer Doubts

Greenwashing appears when there are vague environmental claims or misleading claims that consumers can see in the marketing campaign of companies. Nimri et al. (2024) found that sending misleading messages about their level of environmental friendliness does not reduce the level of information asymmetry according to Signaling Theory; it makes consumers consider it as an attempt to exploit the green market altogether (Chaturvedi et al., 2024).

Speaking about greenwashing, Attribution Theory suggests that consumers will be inclined to make negative observations concerning the company's intentions, so consumers will stop thinking of the company as a defender of the environment and start considering it as a company exploiting its business interests. Hence, such perception causes a psychological response that increases skepticism regarding the credibility of the company in its future marketing efforts. Thus, the next hypothesis can be derived:

- $\backslash \mathrm{varvec} H_1$: **Perceived greenwashing has a positive and significant effect on consumer skepticism.**

3.2. Consumer Skepticism and Green Product Purchase Intention

Skepticism acts as a significant cognitive obstacle to consumption sustainability. Through this skepticism process, consumers adopt a more watchful outlook toward green products, but they begin

rejecting their claimed benefits concerning protection of the environment. In that state of doubt, the perceived psychological and financial hazards of some eco-friendly goods increase since they are generally priced much higher than regular products (Di Mauro et al., 2024).

The existence of skepticism in consumer behavior makes people more cautious about spending money on goods claiming to complement sustainability principles. Furthermore, as skepticism develops, customers become less willing to practice sustainable consumption, thus preferring ordinary goods:

- $\varvec{H}_2$: **Consumer skepticism has a negative and significant effect on green product purchase intention.**

3.3. Direct and Indirect Pathways of Perceived Greenwashing

Apart from creating distrust, perceived greenwashing has a direct negative effect on consumer behavioral intentions. When consumers are aware of greenwashing, they feel that their trust has been violated and that corporates are violating their authenticity. The awareness of such deceptive techniques leads to immediate brand avoidance and rejection of promoted eco-products and fewer possibilities of repeat purchasing (Aguila et al., 2024).

Moreover, unactual environmental communications work through an indirect mental mechanism. Misleading messages increase consumer skepticism (H_1) causing a decrease in the likelihood of green product purchases (H_2). In this structure of the process, consumer skepticism acts as an intervening factor which explains how the consumers' negative view of deception is transformed into their behavioral rejection. To explain both the immediate influence and the psychological mechanism of this relationship, the researchers came up with the following hypotheses:

- $\varvec{H}_3$: **Perceived greenwashing has a direct negative and significant effect on green product purchase intention.**
- $\varvec{H}_4$: **Consumer skepticism significantly mediates the relationship between perceived greenwashing and green product purchase intention.**

This article showcases an organized model to illustrate how perceived greenwashing impacts consumers' sustainability choices in the market. Because of the merger of signaling and attribution theories, the framework depicts perceived greenwashing as less of a marketing tool and more of a systematic mechanism that affects consumers' behavior. In defining the pathways between different factors, the present framework demonstrates the way in which consumers perceive messages about environmentally friendly initiatives in the context of sustainable marketing.

The new aspect of this paper is that it suggests the role of consumer skepticism in understanding how a person reacts to greenwashing. Instead of considering greenwashing makes customers lose interest in

buying the good immediately, the model reveals how doubts arise which results in a decline of buying intentions.

From an analytical perspective, Structural Equation Modeling (SEM) offers distinct advantages over first-generation analytic methods in completing this conceptual framework. With SEM, one can estimate multiple correlated relationships simultaneously and factor in measurement errors in unobserved constructs, adopting greenwashing perceptions, consumer skepticism, and green purchase intentions as unobserved constructs and applying multi-item reflective measures greatly enhances the accuracy of estimating the parameters and testing the hypotheses.

4. Methodology

This section outlines the empirical framework, methodological design, sampling protocol, data collection instrument, and analytical techniques employed to test the proposed structural model of perceived greenwashing, consumer skepticism, and green product purchase intention.

4.1. Research Approach, Method, and Design

In this research, quantitative, non-experimental, cross-sectional, and explanatory research design is used. A quantitative strategy was chosen to objectively determine the relationships between latent constructs through statistical inference. The application of a deductive reasoning method involved the testing of hypotheses derived from Signaling and Attribution theories based on the primary empirical data (Sun & Shi, 2022).

The adoption of a non-experimental cross-sectional design meets the goals of structural equation modeling in research on consumer behavior. Instead of manipulating experimental conditions, this observational research can record changes in consumers' perceptions, psychological states, and behavioral intentions in their natural environment (Lu et al., 2022). Gathering the data at one point in time creates the conditions for isolating different latent constructs and reducing the influence of temporal confounders. Additionally, the explanatory potential of this design is represented not only by the ability to identify correlations but also by the ability to test directional dependencies, straight paths, and indirect mediators (Zhang et al., 2022).

PLS-SEM is a causal-predictive approach that emphasizes prediction through the estimation of statistical models designed to provide causal explanations, thereby overcoming the apparent dichotomy between explanation and prediction.

Hair, et al., (2019). The main advantage of PLS-SEM is that it allows for the estimation of complex models with many constructs, indicator variables, and structural paths without imposing distributional assumptions on the data.

The PLS-SEM approach is preferred when formative constructs are included in the structural model. (Sarstedt, et al, 2021) the adoption of a non-experimental cross-sectional design meets the goals of structural equation modeling in research on consumer behavior. Instead of manipulating experimental conditions, this observational research can record changes in consumers' perceptions, psychological states, and behavioral intentions in their natural environment (Zhang et al., 2022). Gathering the data at one point in time creates the conditions for isolating different latent constructs and reducing the influence of temporal confounders. Additionally, the explanatory potential of this design is represented not only by the ability to identify correlations but also by the ability to test directional dependencies, straight paths, and indirect mediators (Peterson, 2022).

The quantitative approach involves the use of well-known self-evaluating scales to help quantify psychological concepts, especially the concepts of perceived deception and uncertainty. Using deductive reasoning ensures that the operationalized concepts correspond to the corresponding theoretical definitions within the framework of signaling theory and attribution theory. An empirical structure that provides the means of testing hypotheses with the data obtained is used to perform the necessary statistical work for error analysis, construct validity, and draw conclusions.

4.2. Population, Sample Size, and Sampling Protocol

The research will be conducted in Colombia among adult consumers (aged 18 years and above) who make decisions on household purchases and have been exposed to green products advertising through either digital, retail or traditional media. A non-probability sampling method will be used in this study, and both convenience sampling and snowball sampling will be used in determining the target group. Primary data will be collected via an online survey, which will include structured self-administered questions and will be distributed in various main cities of Colombia.

In particular, in order to be eligible for participation in the study, respondents needed to meet four separate criteria, which included the participant being at least 18 years old when filling in the survey, the participant being a legal resident of Colombia, the participant having experienced green product marketing or eco-labeling, and the participants agreeing to take part in the study before they could access the questionnaire.

To ensure data quality and minimize distortion in the following structural equation modeling (SEM) analysis, strict exclusion parameters were applied. After careful data-cleaning, the total of 604 valid answers was preserved (N = 604) after the elimination process according to (1) eliminating people below 18 years of age, (2) excluding those respondents who either didn't participate in studying completion or spent less than three minutes on completion, and (3) those who showed signs of systematic bias in answering.

Table 1
Demographic Profile and Sample Characteristics ()

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Female	338	56.0%
	Male	248	41.1%
	Non-binary / Other	18	2.9%
Age Range	18–24 years	91	15.1%
	25–34 years	248	41.1%
	35–45 years	211	34.9%
	46–49 years	27	4.5%
	$\geq$ 50 years	27	4.4%
Socio-Economic Stratum *(Colombian Classification)*	Low (Strata 1–2)	127	21.0%
	Middle (Strata 3–4)	374	61.9%
	High (Strata 5–6)	103	17.1%

As detailed in Table 1, the final sample used consists of the responses of 604 participants who reside in Colombia. In gender proportion, most of the sample are women (56.0%, n = 338) as opposed to men (41.1%, n = 248) and participants from "non-binary or other genders", who make up only (2.9%, n = 18) of the sample. The findings show that most of the participants lie between age of 25 and 45 years, accounting for 76.0% of the sample(size = 459). The age group of 25–34 represents the largest category with (41.1%, n = 248). It is followed by age group of 35 to 45 years with (34.9%, n = 211). Age groups of 18 to 24 years make up only (15.1%, n = 91), while age groups of 46 to 49 and age group of at least 50 years are barely represented with (4.5%, n = 27) and (4.4.4%, n = 27) respectively.

In reference to socio-economic classification with the Colombian government stratification system being used the sample strongly demonstrates that it consists of urban middle-class families. There is a dominant representation of respondents from Strata 3 and 4, accounting for 61.9% (n = 374) of respondents. Correspondingly, respondents from Low socio-economic strata account for 21.0% (n = 127) while respondents from High socio-economic strata of the test sample represent 17.1% (n = 103). This distribution fits the target population for sustainable marketing research in Colombia well, meaning that it consists of individuals aged 25 to 45 who belong to the middle and high purchasing capacity group, as this age group usually represents the key decision makers as well as buyers of green labeled products, such as eco and organic products.

4.3. Measurement Instrument and Scale Operationalization

Table 2

Constructs, Item Codes, and Adapted Sources

Construct & Item Codes	**Adapted Sources**
Perceived Greenwashing (GW) GW1, GW2, GW3, GW4, GW5, GW6, GW7	Chen & Chang (2013); Fella et al. (2024); Guo et al. (2017); Naderer et al. (2025); Nguyen et al. (2025); Senan et al. (2025)
Consumer Skepticism (ESC) CS1, CS2, CS3, CS4, CS5, CS6	Di Mauro et al. (2024); Liao & Wu (2024); Mohr et al. (2001); Naderer et al. (2025); Obermiller & Spangenberg (1998); Santos et al. (2024); Skarmeas & Leonidou (2013); Zioło et al. (2024)
Green Purchase Intention (IC) GI1, GI2, GI3	Chen & Chang (2012); Grewal et al. (1998); Setiawan & Yosephani (2024)

The research instrument used in the study needed to be built to ensure the validity of construction and reliability of measurement. To achieve this goal, reliable multiple-item scales from previous research in sustainable marketing and customer behavior were adapted. The self-administered questionnaire included 30 items measured on a five-point Likert scale from 1="Strongly disagree" to 5="Strongly agree". All items in the questionnaire were backtranslated into Spanish.

- Perceived Greenwashing (GW) was represented by R10 reflective measures involving variables such as ambiguity of claims, absence of solid proof within messages, misleading digital signals and operational greenwashing. The questionnaire was created based on previous definitions of Chen and Chang (2013), Guo et al. (2017) and included firm and product claims.
- Consumer Skepticism (ESC): This term means a 10-item measure that indicates the level of doubt on the consumer's part concerning environmental claims, insufficient trust in motivations of corporations, and skepticism about green pricing policies. It was developed by means of using Obermiller and Spangenberg’s (1998) scale for ad skepticism in a green marketing context (Mohr et al., 2001; Skarmeas & Leonidou, 2013).
- Green Purchase Intention (IC): This term refers to the scale of 4 items that measure the consumer's intention, probability and conscious willingness to buy a green product instead of a conventional one. It was developed with the help of Grewal et al. (1998) and Chen and Chang (2012).
- Controls / Contextual measures (CM): The measure indicates 6 items, that measure environmental consciousness and perceived product quality as described by Kilbourne and Pickett (2008).

5. Results

The application of the structural modelling framework was subjected to empirical validation using partial least squares structural equation modelling. This made it possible to investigate the intricate interplay among the concepts of greenwashing, consumer skepticism, and the intent to buy green products. The assessment methodology involved research in two phases: in the first phase the measurement model was positioned and tested, and in the second phase the structural model was evaluated with the aim of validating theoretical relationships guiding the hypotheses.

The measurement model evaluation has shown that every scale of our choice has result-oriented psychometric properties. Quantification model was validated with the help of internal reliability measurements, and convergence distance definition. Discriminative validity, that proves that our theoretical perspective is being practically explored, has been validated as well, which was done before we started the importance hypothesis testing.

After confirming the validity of the measurement model, we moved to examine structural modeling, evaluating the relationships as hypothesized in the beginning. The construction of the model proved that the concept of greenwashing plays a leading role in creating doubts in consumers and letting them not buy eco-friendly products. The research found out that greenwashing affects buying decisions by itself and indirectly, namely through the process of skepticism among consumers, which makes purchases even more interactive.

The general mathematical system representing the structural model is expressed as follows:

$$\varvec{\eta} = \mathbf{B}\varvec{\eta} + \varvec{\Gamma}\varvec{\xi} + \varvec{\zeta}$$

Where:

- η indicates the vector of the latent endogenous variables (the Consumer Skepticism and the Green Product Purchase Intention).
- ξ indicates the vector of the latent exogenous variables (the Perceived Greenwashing).
- B indicates the matrix of the structural coefficients specifying the relation among endogenous constructs.
- Γ indicates the matrix of the structural coefficients specifying the relation among the exogenous constructs and the endogenous ones.
- ζ indicates the vector of the inner structural errors (the residuals).

The PLS-SEM framework's structural core is defined through a matrix equation η = Bη + Γξ + ζ, which provides simultaneous equations based on linear dependence between the latent constructs. The matrix equation's η indicates the vector of endogenous latent constructs or Customer Skepticism (η_1) and Green Product Purchase Intention (η_2). The exogenous latent construct, Perceived Greenwashing (ξ_1), is represented in vector ξ.

The structural parameters governing these relationships are elaborated in two path matrices before coming to the error vector. The matrix Γ shows the path coefficients estimating the direct effects of the exogenous latent construct (ξ) on the endogenous variables while B shows the path coefficients defining the directed relationships among the endogenous constructs (η_1→η_2). The term ζ shows the vector of structural residuals (inner errors) accounting for unobserved variance and stochastic disturbance considered in predicting psychological and behavioral outcomes in consumer decision-making models.

Table 3
Reflective Measurement Model Evaluation: Factor Loadings, Construct Reliability, and Convergent Validity Metrics ()

Consumer skepticism	**Cronbach's alpha**	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
	0.844	**0.846**	**0.886**	**0.565**
Green product purchase intention	0.603	0.672	0.784	0.556
Greenwashing	0.855	0.859	0.889	0.536

The psychometric assessment of the reflective measurement model exhibits great internal consistency, construct reliability, and convergent validity for all endogenous variables studied, thereby meeting the highest empirical standards required of partial least squares SEM. Consumer Skepticism (α = 0.844; ρ_c = 0.886) and Perceived Greenwashing (α = 0.855; ρ_c = 0.889) boast robust construct reliability given that both variables exceed the conservative minimum of 0.80, whereas variable Green Product Purchase Intention attains adequate reliability (α = 0.603; ρ_c = 0.784), especially because reliability using composite reliability is more robust, hence being more important in PLS-SEM than any other type of reliability measure (ρ_c). Lastly, the framework satisfies the criteria of convergent validity because the Average Variance Extracted for all latent variables exceeds the state-of-the-art benchmark of 0.50 (from 0.536 for Perceived Greenwashing to 0.565 for Consumer Skepticism).

These psychometric parameters suggest that Colombian consumers are good interpreters of the deceptive green signals and cognitive doubt as he established psychological constructs that are quite stable. The high degree of internal validity of Perceived Greenwashing and Consumer Skepticism means that when consumers face misleading information from companies they will not respond by means of superficial efforts of the mind but will instead conduct a whole process of making their views consistent. Furthermore, the good performance of the empirical model means that the measurement error can be reduced and thus provides a sound basis for further calculations because all the results received will be calculated based on the real nature of existing relations (Au-Yong-Oliveira & Sousa, 2022).

The results of the research highlight the importance for firms from emerging economies to formulate their sustainable communication strategies based on real transparency rather than generalized sustainability claims. Given the high resistance of factors impacting greenwashing perceptions and consumers' sentiment towards it, management should recognize the fact that mere spreading of

messages related to sustainability may generate short-term business benefits but may also result in long-term distrust towards the brand. To solve the problem, brands should be concerned with providing verified information disclosure as well as thorough analysis of the life cycle assessment results.

Table 4
Discriminant Validity Assessment: Heterotrait-Monotrait Ratio (HTMT) Matrix ()

Latent Construct	Consumer Skepticism	Green Product Purchase Intention	Greenwashing
Consumer Skepticism	—		
Green Product Purchase Intention	**0.865**	—	
Greenwashing	**0.861**	**0.716**	—

Note: *HTMT values below 0.90 establish satisfactory discriminant validity between construct pairs (*Henseler et al., 2015).

Through an empirical assessment of the Heterotrait-Monotrait Ratio (HTMT), the findings validate the discriminant validity of the construct pairs used in this study's conceptual framework. This is because two constructs used in the study obtain HTMT ratios that do not exceed 0.90, which is the predetermined HTMT threshold for SEM. For instance, an HTMT ratio of 0.716 has been reported for perceived greenwashing and green product purchase intention, while the HTMT ratio between consumer skepticism and green product purchase intention equals 0.865. The HTMT score for the pair of perceived greenwashing and consumer skepticism is 0.861 and remains well below the critical threshold following the suggestion of Henseler et al. (2015). Although the Fornell-Larcker criterion and other traditional methods have been extensively applied, recent methodological research has shown that the HTMT offers greater sensitivity and specificity in identifying discriminant validity problems within Partial Least Squares Structural Equation Modeling (PLS-SEM).

The analysis informs that psychological uncertainty and marketing deception have a high correlation but nevertheless differ from each other in the perception of Colombia's customers. A notable correlation, but difference, between perceived greenwashing and consumer skepticism (0.861) points out that greenwashing leads to doubt formation, but clients do not perceive the external corporate environment as an exact parameter of the internal condition. Consumer skepticism and green purchasing intention are different concepts, which indicates that consumer skepticism can be understood as a separate mediating variable and not merely considered as a substitute for rejection. The research results have proven that consumers are able to differentiate between corporate green initiatives and individual skepticism, which makes it impossible for companies to avoid skepticism among consumers by using traditional communication means to form a specific image of a brand (Szabo & Webster, 2021). Instead, the attempts to solve the problem should focus on the roots of the confusion regarding companies' statements. Brand managers should therefore focus on the difference between generic sustainability

marketing and product-related marketing and apply genuine eco-certificates and life cycle assessment indicators (Testa et al., 2021).

Table 5
Structural Model Assessment: Path Coefficients, Significance, and Hypotheses Testing ()

Structural Path / Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t Statistics	p Values	Conclusion
$\mathbf{H}_1$: GREENWASHING $\rightarrow$ CONSUMER SKEPTICISM	0.737	0.739	0.028	26.034	0.000	**Supported**
$\mathbf{H}_2$: CONSUMER SKEPTICISM $\rightarrow$ GREEN PRODUCT PURCHASE INTENTION	0.544	0.546	0.048	11.253	0.000	**Supported**
$\mathbf{H}_3$: GREENWASHING $\rightarrow$ GREEN PRODUCT PURCHASE INTENTION	0.135	0.135	0.053	2.558	0.011	**Supported**

According to the analysis that was done on the structural model, all proposed direct path hypotheses are validated empirically (H_1, H_2, and H_3) and statistically significant. The findings confirm that the perceived greenwashing positively and significantly impacts consumer skepticism (β = 0.737, t = 26.034, p < 0.001), therefore supporting Hypothesis 1. It further confirms that consumer skepticism has a significant influence on green product purchase intention (β = 0.544, t = 11.253, p < 0.001), therefore supporting the Hypothesis 2. Lastly, it was found that perceived greenwashing has a positively significant impact on green product purchase intention (β = 0.135, t = 2.558, p = 0.011), therefore confirming the Hypothesis 3.

The findings of this study suggest that the size of the path coefficient establishes the presence of structural asymmetry in the consumer decision-making process. The path coefficient which indicates the connection between greenwashing and consumer skepticism (β = 0.737), suggests that misleading green messages are responsible for the psychological skepticism that exists in the market. At the same time, the impact of greenwashing on the purchase intention (β = 0.135) is relatively small despite the existence of direct connection between the discussed concepts, since the indirect impact of skepticism is considerably higher (β = 0.544). The structural discrepancy mentioned suggests that misleading statements do not lead to direct action, but they convey an indirect influence through cognitive doubt.

The results support Signaling Theory and Attribution Theory in developing markets. According to Signaling Theory, unverifiable corporate statements act as low-quality signals causing increased information asymmetry in the market. While processing unverified eco-conscious statements made by companies, Colombian consumers, according to Attribution Theory, develop an understanding of the deceptive intentions and assess the level of doubt. The evidence provided by the statistical results of H_1 ($t = 26.034$) indicates that the skepticism of consumers in developing markets is not just a character trait, but a mechanism activated by misleading practices.

In addition to that, the structural measures show how much consumer skepticism influences the process of sustainable development in markets. The fact that skepticism has a negative influence on purchase intention (H_2: $\beta = 0.544$) implies that cognitive skepticism is a serious structural hurdle for the integration of green thinking into purchases. The evidence of the direct link from greenwashing to purchase intention (H_3: $\beta = 0.135$) also indicates that greenwashing has its own effect on consumer behavior, making customers avoid brands and experience cognitive dissonance caused by perceived cheating.

The findings make it clear that it is time for companies to change radically their sustainable strategies in the retail markets of Latin America, as customer skepticism is the main connection between the understanding of fraud and unmet demand. Thus, managers should focus on eliminating any uncertainties about the claims of their companies (Fernandes et al., 2020).

Table 6
Comprehensive Predictive Model Assessment: Mediation Analysis, Explanatory Power (), Effect Sizes (), and Predictive Relevance ()

Structural Relationship / Endogenous Construct	***Indirect Effect (β)***	***95% Confidence Interval (BCa)***	***Effect Size (f2)***	***R2 / Radj2***	***Qpredict2***	***Hypothesis / Conclusion***
CONSUMER SKEPTICISM (CS)	***—***	***—***	***—***	***0.543 / 0.542***	***0.301***	***Target Endogenous Construct***
GW → CS	***—***	***—***	***1.188 (Large)***	***—***	***—***	***Direct Antecedent*** ***($p < 0.001$)***
GREEN PURCHASE INTENTION (GI)	—	—	—	**0.423 / 0.421**	**0.232**	*Target Endogenous Construct*
GW → GI	—	—	*0.018 (Small)*	—	—	*Direct Antecedent* *($p = 0.011$)*
CS → GI	—	—	*0.288 (Medium)*	—	—	*Direct Antecedent* *($p < 0.001$)*
$\varvec{H_4}$: *GW → CS → GI*	**0.401**	**[0.324, 0.481]**	—	—	—	**Supported** *(Complementary Mediation)*

Note. R^2 *values derived from empirical estimation. Mediation tested via 5,000 bootstrap subsamples.* $f^2 \geq 0.02, 0.15, 0.35$ *indicate small, medium, and large effects.* $Q^2 > 0$ *establishes predictive relevance.*

The thorough assessment of the predictive model described in Table 5 provides evidence for the key purpose of this study, which is to determine the theoretical relationships between perceived greenwashing, consumer skepticism, and intention to buy eco-friendly products in an emerging market. The findings on the indirect effect provide confirmation for H_4, since they indicate that consumer skepticism has a significant mediating influence on the relationship between perceived greenwashing and intention to buy eco-friendly products. As both the direct effect of greenwashing (β = 0.135) and the indirect effect via skepticism (β = 0.401) are found significant and point in the same direction, the relationship is formally classified as complementary partial mediation. Besides, the model shows very good explanatory capability (R^2 = 0.543 for CS; R^2 = 0.423 for GI) and is characterized by good out-of-

sample predictive force (Q_"predict" ^2 = 0.301 for CS; Q_"predict" ^2 = 0.232 for GI), which provides proof of the adequacy of the empirical model used to answer the main research question.

The f^2 metrics that measure effect sizes show that there are important differences in the influence of antecedents on endogenous constructs. For instance, perceived greenwashing is a major factor in creating consumer skepticism (f^2 = 1.188), since no other structural factor can have a bigger cognitive effect on doubt. Consumer skepticism has a medium too high influence on the level of green purchasing intention (f^2 = 0.288) while the role of greenwashing is minimal (f^2 = 0.018). Such a discrepancy shows that even if greenwashing creates some skepticism among consumers, the effect on the intention to buy is through psychological distrust rather than behavioral hurdles.

These predictive indicators yield vital information about consumer behavior in the Colombian retail sector which satisfies the basic goals of this research. High explanatory value (R2 = 0.423) and predictive significance of the model (Q_ predict ^2 = 0.232) show how theoretical concept of Signaling Theory combined with Attribution Theory can explain purchasing behavior based on sustainability in Latin America. In developing countries, such as Colombia where the mechanism of regulation of environmental claims is still forming, consumers deal with high level of information asymmetry. As a result, the use of unverifiable green signals by companies leads to negative conclusions of consumers about their motivations, which creates an obstacle for green product demand due to skepticism (Burkert et al., 2023).

From a wider conceptual viewpoint, the confirmed mediation mechanism (H_4) sheds light on the persistent "intention-behavior gap" in the sustainable marketing literature. The empirical findings indicate that greenwashing does not just act to reduce the purchase intention in a straightforward manner, rather, it gradually destroys trust in the market by inducing public skepticism. Since skepticism is responsible for most of the indirect effect (β = 0.401), the activated cognitive doubt is regarded as the main psychological force through which misleading marketing tactics cancel eco-friendly buying intention in the young consumers’ category.

The conclusions outlined in this work present concrete suggestions for green brand managers, regulators, and corporate strategists operating in Colombia and other similar emerging economies. To combat the significant impact of greenwashing on consumers' skepticism (f^2 = 1.188), it is critical that companies stop engaging in superficial eco-marketing and instead utilize the principle of genuine operational transparency. Specifically, managers must concentrate on delivering third-party validated eco-labels, implementing transparent life-cycle assessments, and ensuring that online communications are clear and straightforward to eliminate skepticism among consumers. Because of the strong predictive validity of the model (Q_"predict" ^2 > 0), regulatory institutions must implement stricter requirements regarding environmental labels and legal audit procedures.

The analysis of the Importance-Performance Map Analysis (IPMA) provided at the indicator level in Fig. 3 distinctly enhances the results of the structural equation modeling and directly fulfills the primary aim of the present research as expressed in its title and objectives. Besides, the importance of IPMA

analyzing the total effect (importance) of each indicator against its rescaled average score (score on the scale from 0 to 100) for the focal point of the analysis, which is Green Product Purchase Intention. The descriptive analysis shows some clustering of the indicators according to space. The indicators measuring the Consumer Skepticism (CS1–CS6) demonstrate high importance scores (with total effects from 0.113 to 0.127), however, moderate performance results (63 to 67 points), while the indicators measuring Perceived Greenwashing (GW1-GW7) have varying importance results but also the lowest overall performance results.

The geographical location of the measures in the scatter plot supports the main theoretical subject of the research and its thesis about consumer psychology in emerging retail markets. The placement of six Consumer Skepticism measures (CS1 – CS6) at the very top of the significance axis shows that cognitive skepticism is the most important element impacting sustainable buying behavior of Colombian consumers. The elevated indices of CS4 (0.127), CS3 (0.123), CS2 (0.123), and CS1 (0.121) mean that skepticism about corporate intentions, green price premiums, and claim credibility results in the existence of an efficient psychological impediment that could influence every green purchasing decision. The considerable values of each of these skepticism entities imply that doubt in the Colombian market is practical rather than theoretical and presents a hindrance to sustainability-oriented expenditure (Bustamante Matoma & Lombana Díaz, 2025).

Moreover, the evaluation done by the IPMA reveals important information about specific operational dimensions of the phenomenon of greenwashing and how they create friction on the Colombian consumer market. The two indicators with the lowest scores in the whole diagnostic map belong to GW1 (57.8 points) and GW2 (59.1 points) which measure the ambiguity of the claims and absence of real environmental proof. At the same time, significant greenwashing metrics GW5 (0.117) and GW7 (0.117), which denote digital green exaggeration and unproven environmental claims, are positioned near the high-importance line along with skepticism metrics. This spatial picture shows that impeding digital communication tactics and unproven environmental claims produce high results in terms of skepticism metrics indicating the mechanism through which corporate fraud produces psychological distrust in economies with little regulation (Nyquist, 2024).

The empirical results presented herein provide a context for understanding the structural relationships that exist in direct association with the title and objectives of this study within Colombia's emerging economy context. In environments where there is institutional transition like in developing countries, information asymmetry between companies and consumers is particularly significant. The IPMA matrix affirms that Colombian consumers do not hesitate to decode misleading marketing messages (GW1-GW7) that refers to the process by which consumers would convert unsubstantiated communications into a more generalized skepticism (CS1-CS6). This is shown to give rise to the gap between intention and behavior in Colombia, since consumers tend to overlook eco-friendly features of products if marketing efforts fail to deliver verifiable proof of information.

The IPMA framework provides established strategic objectives of corporate brand managers, policy makers, and sustainability professionals involved in ensuring genuine eco-friendly consumption in Latin America. According to conventional IPMA logic, managers should act in areas that have seen high importance and low-to-medium levels of performance. Thus, companies should quickly allocate operational resources to tackle GW5, GW7, GW1, and GW2 by establishing precise definitions of concepts, limiting exaggerated eco-messages on social media, and ensuring that the claims made about products are backed by independent third-party certifications (Pedersen, 2024). Regulatory authorities in Colombia should realize that it is what makes it so crucial to introduce systematic rules for green marketing and audit sites talking about green benefits of products (Strizhakova & Coulter, 2024).

6. Discussion

The empirical results of this research offer important insights into the impact of perceived greenwashing on sustainable consumer behavior in emerging markets with special focus on the Colombian case. This study has employed a combination of Signaling Theory and Attribution Theory within a structural equation modeling framework showing that perceived greenwashing is a key driver of consumers' skepticism thus leading to inhibition of their green purchase intentions (Bustamante Matoma et al., 2022). In this way, misleading environmental messages do not serve merely as a behavioral deterrent but rather act via understanding where the cognitive doubts are interplaying between perceived corporate deception and purchase avoidance (Alden, 2024).

The predictive analysis demonstrates the significance of consumer skepticism as the most crucial point of leveraging green purchases by showing that information asymmetry and unproven advertisements are contributing to the ongoing intention-behavior gap in Latin America. Overall, the picture indicates that there is a much more careful consumer empowered to control companies' environmental claims rewarding true transparency and denying vague environmental message (Smith & Winterich, 2024).

6.1. Theoretical Implications

This study enriches the understanding of the field of sustainable marketing by exploring how perceived greenwashing affects consumers' decision-making in developing countries. First, the paper supports the concept of partial mediation by providing evidence that skepticism is the main mechanism through which greenwashing influences consumers' behavior. Based on this finding, the authors make a significant contribution to signaling theory by showing that unverified green claims serve as weakened market signals, which not only fail to persuade consumers but also cause cognitive friction in the signaling environment.

Second, the findings support attribution theory in the context of emerging markets by confirming that when consumers observe vague or exaggerated claims, they attribute selfish motives to companies. This process results in transforming external marketing stimuli into high levels of general skepticism by

demonstrating that psychological doubts can be regarded as an effective defensive mechanism rather than a psychological personality trait.

6.2. Managerial / Practical Implications

The practical implications of results obtained through discrete structural and importance-performance mapping strategy analyses can significantly streamline the work of brand managers, sustainability professionals, and policymakers in Latin America. The observation that the highest importance factor is consumer skepticism across all parameters studied suggests that traditional green marketing is no longer capable of driving sales for companies. To regain consumer trust, it is necessary to solve the problem of clarity in the claims by substantiating all environmental claims with documents from independent third-party certification organizations, verified life cycle assessments, and current information about the supply chain.

Moreover, since digital eco-exaggeration and unproven claims were identified as of great importance and yet underperformed, the marketing divisions of companies need to audit their digital communication means so that the claims made by companies are credible.

For the regulators and decision-makers of Colombia, the above-mentioned information highlights the urgent necessity to introduce uniform strategies for green marketing and regulatory auditing which would allow minimizing the volume of prohibited practices, protecting fair trade activities, and restoring consumer trust in green marketing.

6.3. Limitations and Future Research Directions

This study offers important contributions theoretically and empirically; however, it also involves several limitations that provide an opportunity for subsequent research. First, the use of a cross-sectional study design does not allow to observe how consumer skepticism changes through time with regard to changing regulatory norms and increase in transparency; therefore, future studies need to implement either longitudinal or experimental designs to reveal how consumer responses and perceptions are changed due to compliance by the companies.

Second, although the research is based on the sample of N = 604 Colombian consumers, which is large enough to provide reliable results in the context of an emerging country, transferability of the findings to other developing and developed parts of the world needs to be carried out with caution since different regulatory practices and different attitudes towards sustainability exist.

Future studies are to test the proposed model in different product categories (e.g., fast-moving consumer goods and durable goods) and analyze the impacts of various influencing factors such as environmental involvement, reputation, and generation on the consumers’ perceptions regarding greenwashing.

6.4. Conclusion

In this study, persuasive empirical proof is offered concerning the structural methods in which greenwashing inhibits sustainable consumer behavior relative to emerging markets. More specifically, by confirming a unified structural model in the context of Colombian customers, this study shows that false environmental claims are carried out predominantly as an indirect deterrent, generating consumer skepticism that effectively undermines the intention to buy green products. Moreover, the results show that notwithstanding the fact that greenwashing has a direct impact on purchasing behavior, its real negative capacity is in engendering the increased cognitive suspicion making skepticism a crucial link that determines the green intention-action gap.

The predictive and diagnostic assessments prove that consumer skepticism is the most important leverage point in sustainable decision-making. Significant indicators associated with the exaggeration of digital messages and unverified eco-labels demonstrate that consumers from developing countries screen corporate messages in a heavily defensive mode. Meanwhile, the further changes in regulations in countries like Latin America are accompanied by the fact that information asymmetry makes it impossible to change promotional perceptions into the promotional effect.

At the theoretical level, this study incorporates both Signaling Theory and Attribution Theory to shed light on consumer reactions toward duplicitous behavior from corporations. The study demonstrates that the presence of inaccurate environmental signals confuses the information environment, causing consumers to attribute ulterior motives to corporations and adopt the strategy of skepticism. The investigation improves the understanding of the pathways linking invisible corporate communication failures to customers' appraisals by means of partial least squares structural equation modeling.

From the practical standpoint, the research conveys the following message to stakeholders such as brand developers, corporate executives and policymakers working in young retail markets. Authentic positioning in the market cannot rely on generalized and unsupported environmental claims because superficial claims backfire by raising distrust toward brands. In order to restore brand equity and trigger green demand, it is necessary to switch to the full-scale operational transparency supported by verified third-party certification, metrics of life-cycle impact and strict supply chain disclosures that eliminate consumer skepticism prior to attempting to attract market interest.

In the end, the key to bridging the gap between consumers’ desire to be environmentally conscious and their actual buying behaviors is the creation of a transparent marketing landscape that distinguishes between genuine and phony works by corporations. As consumers become more concerned with having their expectations met, companies that take steps to communicate their message with clarity can reduce skepticism and gain competitive advantage as a result. Setting up strict auditing procedures and open lines of communication is crucial to regaining trust of consumers and encouraging sustainable consumption in developing economies.

Declarations

Declarations

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

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The authors declare that they have no competing financial or non-financial interests that could have influenced the work reported in this paper.

Ethics Approval and Consent to Participate

Ethics Approval: The study protocol was waived/deemed to be exempt by the Ethics Committee of Universidad de La Salle due to the anonymous and non-invasive nature of the survey among adult consumers.

Ethical Compliance

The study was conducted in accordance with the relevant ethical guidelines and regulations, specifically adhering to the ethical principles outlined in the Declaration of Helsinki

Consent to Participate:

Informed consent was obtained from all individual participants prior to completing the online survey. Participation was entirely voluntary and anonymized.

Consent for Publication

Not applicable. The study collected and analyzed anonymized aggregate survey data only; no individual participant details, personal identifiers, or media are presented in this paper.

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Author Contribution

Harold Anderson Bustamante Matoma: Conceptualization, Methodology, Formal Analysis, Writing original draft. Jairo Alberto Agudelo Ruiz: Conceptualization, Data Curation, Writing, Review & Editing, Supervision.

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Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Figures

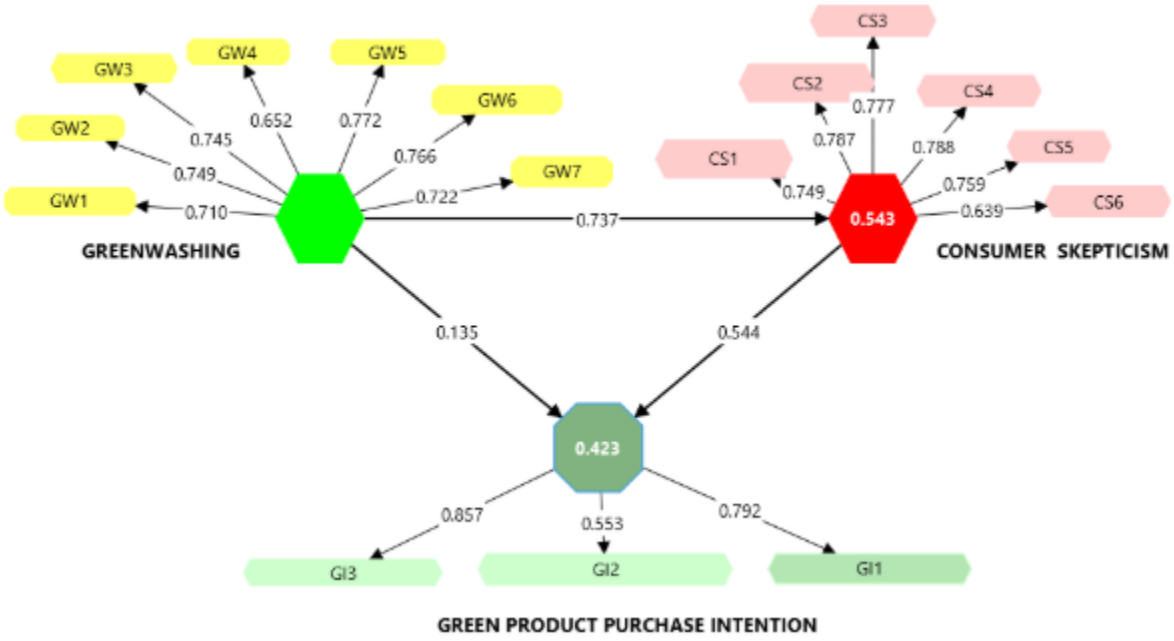


Figure 1

Measurement and Structural Model Evaluation using PLS-SEM

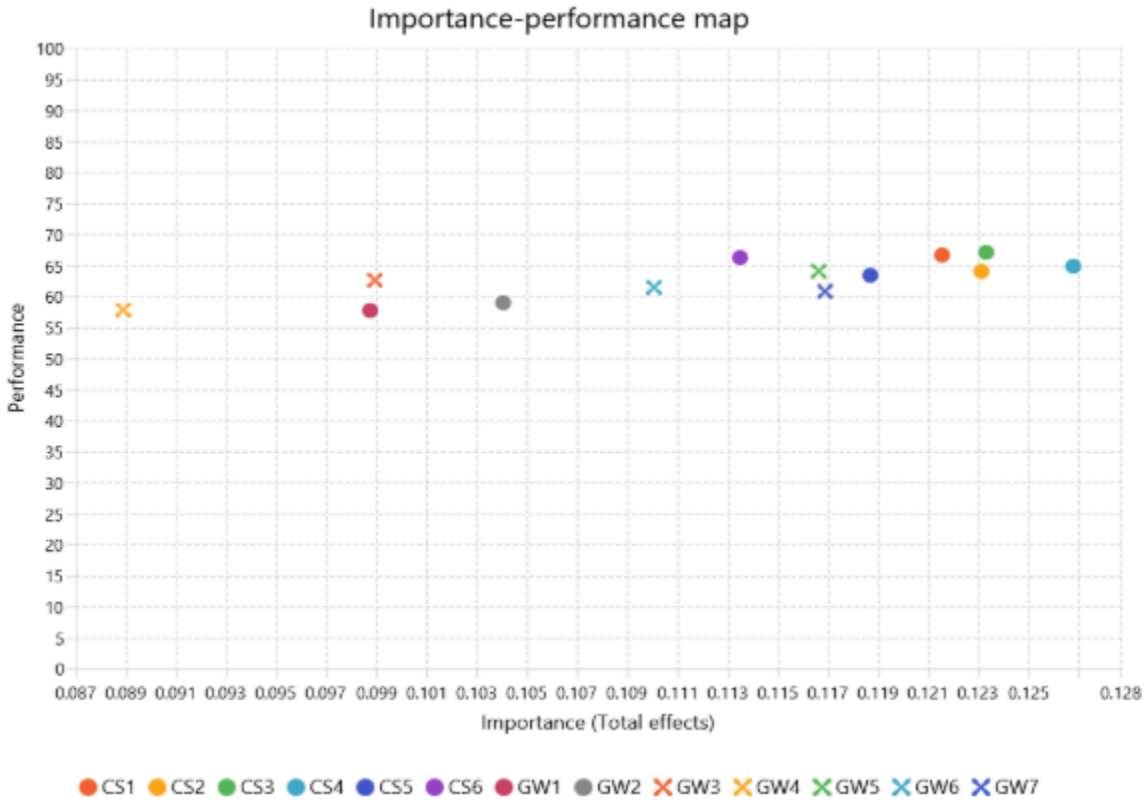


Figure 2

Importance-Performance Map Analysis (IPMA) for Green Product Purchase Intention (Indicator Level)