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***Article***

# The Impact of Green Marketing Message Overload on Consumer Skepticism toward Sustainable Brands: The Mediating Role of Green Fatigue

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## Abstract

This study examines how green marketing message overload influences consumer skepticism toward sustainable brands, with green fatigue proposed as a mediating mechanism. Drawing on Cognitive Load Theory, the Persuasion Knowledge Model, and Green Consumer Theory, the research argues that excessive exposure to sustainability-related messages may exhaust consumers cognitively and emotionally, thereby weakening their trust in green brand communications. Using a quantitative, deductive design, data were collected from Malaysian consumers exposed to green branding, eco-labels, Environmental, Social, and Governance (ESG) messages, and sustainability-oriented digital advertising. The model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). Results show that green marketing message overload does not directly increase consumer skepticism; however, it has a strong positive effect on green fatigue, which in turn significantly increases skepticism toward sustainable brands. Mediation analysis confirms that green fatigue fully mediates the relationship between message overload and consumer skepticism. These findings suggest that skepticism may arise not merely from greenwashing or poor message credibility, but also from consumers' exhaustion caused by repeated sustainability communication. The study contributes to green marketing literature by validating green fatigue as a psychological mediator and offers practical guidance for brands to prioritize message relevance, clarity, and moderation over communication frequency.

**Keywords:** Green Marketing; Message Overload; Green Fatigue; Consumer Skepticism; Sustainable Brands.

## 1. Introduction

During the past twenty years, sustainability marketing communication has undergone an unprecedented expansion with a plethora of brands devoting extensive efforts towards promoting their environmental benefits to a consumer audience more environmentally aware than ever before. In spite of the fact that this trend undoubtedly marks significant advances in the field of corporate environmental responsibility, its main drawback is the creation of an overcrowded communicative ecosystem of messages, labels, and sustainability narratives competing for consumers' attention through any digital medium. The paradox inherent in the phenomenon described above lies in the possibility that the abundance of green marketing messages that are supposed to increase consumers' trust in green brands might in fact diminish said trust. Unraveling this counter-intuitive process represents one of the central challenges facing sustainability marketing research today.

Green advertising research has made great advances since the pioneering content analysis studies that highlighted significant heterogeneity in how environmental claims were framed and supported (Carlson et al., 1993; Banerjee et al., 1995). Early studies uncovered that increased competition within the green marketing industry leads to the weakening of standards and quality of claims, which is likely to induce skepticism among consumers. In addition, later research in the field of greenwashing demonstrated that in spite of causing damage to individual brands' reputations, greenwashing negatively impacts consumer attitudes towards other, more credible green brands (Delmas & Burbano, 2011; Torelli et al., 2020). The cumulative result of exposure to greenwashing campaigns is the formation of defensive cognition among consumers in response to green marketing communications, which was extensively researched in both advertising skepticism and green skepticism literature (Obermiller & Spangenberg, 1998; Leonidou & Skarmeas, 2017).

What the current green advertising literature has not sufficiently considered is the role of communication volume. According to Information Overload Theory, formulated in organizational and consumer behavior studies (Jacoby et al., 1974; Malhotra, 1982; Eppler & Mengis, 2004), once a certain threshold of information has been reached, its additional amount is not conducive to decision-making quality but rather tends to produce negative cognitive effects like mental fatigue and disorientation. Later research confirmed the persistence of this overload dynamic in the context of digital media with the help of algorithms ensuring continuous content streams (Roetzel, 2019). How would this phenomenon manifest itself in green communication? Does the volume of communication with consumers affect consumer skepticism independently from message quality through a unique cognitive and emotional exhaustion specific to green content?

A possible theoretical basis for the relationship between information overload and skepticism is green fatigue. This phenomenon was discussed as a reason for sustainable tourism development problems (Moscardo & Pearce, 2019) and eco-consumerism issues (Peattie, 2010). Green fatigue refers to the feeling of exhaustion that appears because of constant exposure to green claims and pressures, and this psychological process could be considered a mediator leading to skepticism. While the idea of green fatigue was clearly explained in scientific literature, the researchers have not yet tested the hypothesis about its impact on consumers' attitudes as a mediator for their perceptions.

The aim of this research is to close the gap in the existing literature about the mediating effect of green fatigue on the link between information overload and consumer skepticism related to green brands. The development of a model based on these constructs will help in understanding whether such an effect exists or not. Three theoretical frameworks guide the research: Cognitive Overload Theory that sheds light on depletion of cognitive resources because of information overload (Sweller, 1988; Mayer & Moreno, 2003), the Persuasion Knowledge Model that describes consumers' beliefs regarding persuasion (Friestad & Wright, 1994; Campbell & Kirmani, 2000), and Green Consumer Theory that discusses consumer behaviors (Groening et al., 2018).

Malaysia is chosen as the appropriate empirical setting for conducting research in green skepticism because Southeast Asian markets, including Malaysia, have witnessed explosive growth in green marketing activity, with both multinational and national brands attempting to position themselves as sustainable in light of changing consumer preferences and regulations. However, current research exploring the effects of overexposure to green communications on consumers in Southeast Asia, let alone Malaysia, is scarce and focuses almost exclusively on positive green purchase behavior. This study aims to contribute to the academic literature by filling this research gap with regard to the psychological effects of green marketing and provide practical guidelines for green brand managers wishing to prevent unintentional alienation of environmentally conscious consumers.

In theoretical terms, this research proposes green fatigue as a concept mediating overload and skepticism and attempts to validate this mediating effect. Practically, the results of the study are supposed to help green brand managers adjust their strategies regarding the frequency and intensity of green marketing communication to avoid overexposure. The following sections contain a critical review of the literature and the formulation of hypotheses followed by the description of research methodology and its expected findings and practical applications.

## 2. Literature Review

### 2.1 Green Marketing Communication and the Emergence of Skepticism

Green marketing literature primarily focused on describing the forms and frequency of environmental statements in mainstream advertising (Carlson et al., 1993). Eventually, research interest shifted from analyzing the contents of claims made by companies to examining consumers' perception and evaluation of such advertisements. Notably, studies found that when environmental claims were perceived as vague, not verifiable or strategically motivated, they elicited negative evaluation rather than the formation of desired attitudes towards the products (Mohr & Webb, 1998; Mohr et al., 1998). Thus, the development of greenwashing scholarship culminated in Mohr et al.'s (1998) paper introducing a psychometric scale specifically created to measure consumer's environmental skepticism, which turned out to be a consistent trait rather than an ephemeral reaction. The theoretical importance of this finding lies in its implication that constant exposure to potentially misleading green advertisements can create an attitude orientation that will resist being undone solely by favorable encounters with the brands in question.

In particular, greenwashing literature advanced the theory of why consumers developed a skeptical attitude. For instance, Delmas and Burbano (2011) described the motives behind firms' exaggeration of their actual environmental performance, while Lyon and Montgomery (2015) concluded that this phenomenon was prevalent enough to become a system problem. On the consumer side, Nyilasy et al. (2014) found that a

contrast between green advertising campaigns and low environmental performance leads to more pronounced skepticism, implying that consumers conduct a consistency check on the advertisements themselves. Finally, Torelli et al. (2020) found that distrust created in this way applies to organizations at large, thus reducing stakeholders' confidence in sustainability communication itself. Collectively, this literature demonstrates that the self-defeating nature of greenwashing has created an environment in which any claim about sustainable practices can be distrusted by stakeholders.

### 2.2 Information Overload and Its Behavioral Consequences

Whereas a vast body of literature has explored the dynamics and implications of greenwashing, another stream of research has been devoted to exploring the psychological ramifications of an information overflow. The basic assumption here has been introduced by Jacoby et al. (1974) and later operationalized by Malhotra (1982). Namely, the notion of human cognitive processing capacity being limited has been established as the starting point, suggesting that while information richness initially enhances decision-making performance, overload starts occurring as soon as the limit is exceeded. Eppler and Mengis (2004) have reviewed literature on this topic from several disciplines and revealed a pattern of decision paralysis, loss of confidence in evaluations, and increased use of heuristics in information-overload situations. Roetzel (2019) has confirmed such effects in digital media settings, arguing that because of the very structure of online platforms generating constant streams of content tailored to users' preferences, overload becomes an almost permanent state for digital media consumers.

As for the underlying mechanisms, perhaps the best fit would be provided by the theory proposed by Sweller (1988), distinguishing between intrinsic, extraneous, and germane cognitive loads. Further elaboration of the model by Mayer and Moreno (2003) has applied it to multimedia messages, showing that whenever the extraneous cognitive load imposed on working memory due to message format exceeds available working memory, comprehension is compromised and negative affective experiences occur. If applied to the situation of green marketing and the overload of consumer cognition, such theoretical premises make the hypothesis about the negative cognitive consequences plausible.

### 2.3 Green Fatigue as an Emerging Construct

While green fatigue is yet to attain the conceptual clarity that advertising skepticism and information overload have achieved, there exist numerous isolated mentions of the term, illustrating an increasingly clear perception of the phenomenon and its significance. Specifically, Peattie (2010) mentions green consumer behavior norms and the emergence of consumer resistance to normative pressures for environmentally responsible behavior as noted during the review of such behavior norms. Additionally, Moscardo and Pearce (2019) identify eco-fatigue as an important challenge to sustainable tourist experiences and have found that increased exposure to sustainable tourism messages decreases tourists' satisfaction and engagement. Finally, Trudel (2019) frames the concept in the context of sustainable consumer psychology, emphasizing that the mental costs associated with continuous green consumption are often understated by practitioners. Overall, it can be argued that green fatigue represents a concept distinct from information overload and advertising skepticism, bridging the gap between them as an intermediary affective stage through which the latter transforms into the former.

### 2.4 Research Gaps and the Present Study's Contribution

Even with all these contributions to knowledge, certain deficiencies are evident within the literature. First, while the literature abounds with research on the relationship between greenwashing, advertising skepticism, and message quality, surprisingly there is very limited empirical evidence on the relationship between the same variables with respect to message quantity. It is essential to recognize that volume-based skepticism may work differently than quality-based skepticism since the former involves a different process and consequently will require a different theoretical lens and practical implications. Second, green fatigue is largely an undefined term, which is treated mainly as an anecdote, rather than a formal mediating construct. Third, most of the empirical tests regarding green marketing effectiveness have been conducted in either Western societies or other developed parts of East Asia. The current study seeks to address the existing deficiencies by providing evidence for the role of green fatigue as the mediating process linking message overload and consumer skepticism using Malaysian consumers as subjects.

## 3. Theoretical Framework and Hypotheses Development

### 3.1 Theoretical Foundations

The theoretical background of the current research draws upon three distinct and interconnected theoretical traditions in order to explain how green marketing overload can lead to an attitude characterized by skepticism, as mediated by green fatigue. Each of these traditions approaches the problem through different analytical lenses, and their synthesis results in a more complex explanation than is achievable through any one tradition individually.

According to the Cognitive Load Theory developed by Sweller (1988) and Mayer and Moreno (2003), human working memory is known to be characterized by a limited capacity, so the quality of information processing deteriorates and leads to negative responses as a result of exceeding cognitive demand. The empirical basis for this theory, in the context of marketing research, was provided by Jacoby et al. (1974) and Malhotra (1982), which showed that information overload decreases decision-making quality and results in increased negative responses of consumers. Eppler and Mengis (2004) proved the validity of this phenomenon in general terms. Later, Roetzel (2019) examined the phenomenon in the context of digital marketing activities, pointing out that digital platform design is prone to triggering nearly constant cognitive overload among active users. This theory is used by the current study to explain why cognitive exhaustion is caused by excessive amounts of green marketing messages.

First proposed by Friestad and Wright (1994), then elaborated by Campbell and Kirmani (2000), the Persuasion Knowledge Model focuses not on information overload but on how consumers develop lay theories concerning motives behind other actors' actions aimed at persuading them to change their attitude or behavior. Persuasion knowledge becomes functional in situations when consumers feel being persuaded because it triggers skepticism during information processing. According to Obermiller and Spangenberg (1998), habit-driven consumer skepticism toward advertisements can be regarded as an individual trait formed through prolonged advertising exposure. Within the framework of green marketing communications, Do Paco and Reis (2016) and Matthes and Wonneberger (2014) successfully applied this idea to demonstrate the relation between high exposure levels and increased consumer skepticism.

Green Consumer Theory is represented in Groening et al.'s (2018) literature review. While this research area includes some important concepts discussed in other theoretical traditions (e.g., information overload and persuasion knowledge), the specific contribution of the field consists of the contextualization of these concepts. Namely, green consumer research reveals that people relate to sustainable business practices on many levels, which go beyond personal cognition insofar as they are subject to various normative pressures as well as authenticity and credibility concerns. For example, Chen and Chang (2012, 2013) illustrated the fragility of green trust in light of perception of associated risks, while Leonidou and Skarmeas (2017) demonstrated the structural determinants of consumer skepticism toward green practices.

### 3.2 Hypotheses Development

The hypotheses presented below are grounded in the theoretical framework discussed above. As shown in Figure 1, the conceptual model demonstrates the relationship among the key constructs proposed for investigation.

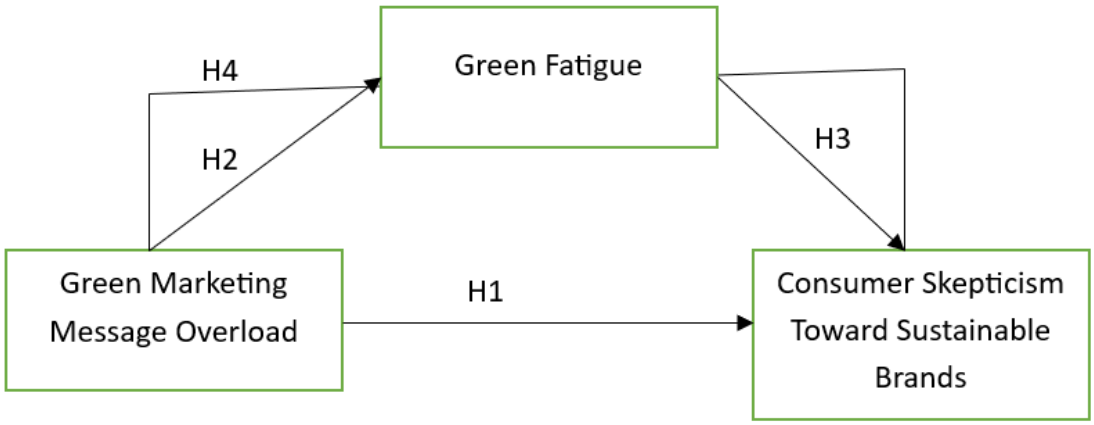


Figure 1: Conceptual Model

Green Marketing Message Overload and Consumer Skepticism: The relation between green message overload and consumer skepticism can be understood from the point of view of the Persuasion Knowledge Model and existing studies of overload. When consumers are exposed to large amounts of information related to green marketing activities, there is an overall effect of informational richness and cognitive burden. In other words, according to Friestad and Wright (1994), exposure to persuasive communication makes consumers more knowledgeable about such communication and thus more vigilant concerning the marketing purposes of the latter. This statement has been confirmed by Matthes and Wonneberger (2014), who showed that skepticism toward green advertising is growing along with increased exposure frequency. Moreover, as reported by Obermiller et al. (2005), activated advertising skepticism generalizes from individual ad levels to evaluations of brand trust. Such behavior was observed in the environmental context by Mohr et al. (1998).

***H1:*** *Green marketing message overload has a significant positive effect on consumer skepticism toward sustainable brands.*

Overloading in Green Marketing and Green Fatigue from an Academic Viewpoint: The shift from overload to fatigue is theoretically justified through the concept of cognitive overload. According to Sweller (1988),

prolonged mental effort leads to aversive motivational states as a result of resource depletion. This idea was later developed by Mayer and Moreno (2003) to mean that too many cognitive inputs do not only interfere with learning processes in communication but cause negative emotions. Regarding the study on green marketing, Peattie (2010) found out that morality in sustainability messages creates avoidance behavior for some customers. Further, Trudel (2019) argues that psychology in sustainable consumption includes exhausting aspects which become increasingly difficult over time and experience. The best example of an empirical study similar to green fatigue is eco-fatigue, as described by Moscardo and Pearce (2019). It is a consequence of exposure to numerous sustainability messages in the tourism industry. As Eppler and Mengis (2004) argue, one of the reactions to information overload involves avoiding negative emotions.

***H2:*** *Green marketing message overload has a significant positive effect on green fatigue.*

Green Fatigue and Consumer Skepticism: The phenomenon of green fatigue, characterized by mental exhaustion induced by repeated exposure to sustainability messages, is proposed to create consumer skepticism through at least two channels. Firstly, mental exhaustion leads to reduced cognitive resources that are necessary for thorough evaluations of the veracity of single green claims, which results in an increased use of heuristics, one of which is skepticism about advertising communications (Campbell & Kirmani, 2000). Secondly, the negative affective state associated with green fatigue, which is characterized by feelings of frustration, disengagement, and overcommunication, generalizes from the green message content to the brand behind the message. Leonidou and Skarmeas (2017) found that generalized diffuse negative affect toward green marketing can turn into a stable skeptical attitude, whereas Chen and Chang (2013) found that green communication-induced cognitive overload causes perceptions of higher green risk and reduced green trust.

***H3:*** *Green fatigue has a significant positive effect on consumer skepticism toward sustainable brands.*

Green Fatigue as a Mediator: The last hypothesis is one about mediation and postulates the role played by green fatigue in mediating the influence of message overload on consumer skepticism. In this respect, it is important to note that this hypothesis fits into the theoretical framework of the research outlined above because message overload exhausts cognitive capacity and evokes negative affective responses via Cognitive Overload Theory, and fatigue leads to the increase of accessibility and prominence of persuasion knowledge through the Persuasion Knowledge Model process, while finally, the generated mechanism is employed to instill skepticism towards sustainable products under Green Consumer Theory. Specifically, the work by Friestad and Wright (1994) proves the sensitivity of persuasion knowledge to the context, and its easier activation in situations characterized by low cognitive fluency, which corresponds exactly to green fatigue. Therefore, the suggested mediation adds to extant literature by establishing a link between the structural attribute of communication (message volume) and consumer attitude (skepticism). Figure 1 presents the model of the study, where message overload represents the antecedent, green fatigue the mediator, and consumer skepticism the dependent variable.

***H4:*** *Green fatigue mediates the relationship between green marketing message overload and consumer skepticism toward sustainable brands.*

## 4. Methodology

### 4.1 Research Design

Research design is a deductive method of quantitative research. This means that because the research is based on testing theories and hypotheses regarding directional relations between variables, the deductive method fits best in this particular case. In fact, this is the only way that allows confirming, disproving, or adjusting the theoretical statements made in the previous section of the paper.

### 4.2 Target Population and Sampling Strategy

The target population of this research study is defined as Malaysian consumers who experienced any marketing communications related to sustainability. These include messages associated with green branding, eco-labels promotion, and Environmental, Social, and Governance (ESG) online advertisements. Such definition is theoretically based in the sense that the key constructs of message overload, green fatigue, and sustainable branding skepticism are related to actual experiences which can be investigated only among people with sufficient prior exposure. Relevant population segments include consumers using eco-friendly product brands, social media users interacting via platforms with extensive use of green advertising (Instagram, Facebook), members of online sustainability forums, and shoppers experiencing sustainable branding messages while online shopping.

Purposive sampling was used as the sampling technique in this case because it allows selecting specific respondents matching particular eligibility criteria instead of applying probabilistic sampling to a general population, where the ratio of eligible individuals might not be sufficient and would be impossible to verify. With regard to the nature of this study, purposive sampling was chosen as a means to ensure construct validity in the process of data collection. Questionnaires were distributed among Malaysian university students' community, Facebook sustainability groups, Instagram, LinkedIn, green lifestyle forums, and e-commerce websites with visible sustainability positioning.

The data was collected using Google Forms, with settings enabled to prevent multiple responses from the same participant and requiring completion of all questions before submission. Consequently, the data contained no duplicate or incomplete responses, enhancing the quality of the collected data and increasing the reliability of the study's results.

As mentioned above, the sample size was estimated considering the requirements of the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach to data analysis. According to the established criteria, at least 377 questionnaires need to be collected to reach the required levels of statistical power and effect detection. The obtained figure meets thresholds associated with the specified level of model complexity, multiple constructs, and anticipated effect sizes. At the same time, this figure is consistent with the 10-times rule used as a heuristic criterion. In view of these considerations, the goal of collecting 377 usable questionnaires was adopted with a certain oversampling allowance for incomplete and invalid returns.

Considering the scope of this study, Malaysia presents a very interesting and understudied environment. Indeed, there has been quite noticeable development of sustainable marketing in Malaysia over the past several years as a result of increasing regulatory requirements, corporate campaigns of multinational companies, and increased domestic activity of green brands. As a result, today Malaysian consumers

experience ESG narrative in various types of communication as well as claims about environmental and social friendliness of different products. While the current situation is quite relevant to the theoretical model developed in the study, little attention was paid to the negative psychological consequences of experiencing marketing communications related to sustainability in Malaysia and wider Southeast Asia. Most of the existing empirical studies were devoted to positive effects of green marketing communication, particularly green purchase intention (Joshi & Rahman, 2015; Chen & Chang, 2012).

### 4.3 Measurement Instrument

The data gathering methodology entailed the use of a structured self-administered online survey in English. Green marketing message overload, green fatigue, and consumer skepticism toward sustainable products were the three key constructs that were measured by six questions for each construct, giving a total of eighteen measurement items. The survey was carried out using the five-point Likert scale, where respondents could indicate "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree" (1–5). Five-point Likert scale is considered reliable and effective means of evaluating latent variables through PLS-SEM.

Green marketing message overload measurement items have been adopted from existing information overload measurement scales (Eppler & Mengis, 2004; Roetzel, 2019) and adapted to represent the issue of green marketing messages overload. The measures of green fatigue have been taken from the eco-fatigue construct suggested by Moscardo and Pearce (2019) along with other valid and well-known measures of fatigue (Peattie, 2010; Trudel, 2019). Consumer skepticism was measured through a series of questions based on the environmental skepticism measure proposed by Mohr et al. (1998). Also, other reliable measurement scales were included (Obermiller & Spangenberg, 1998; Matthes & Wonneberger, 2014).

Before carrying out data collection using the questionnaire, a pilot test was conducted for the reliability assessment. The results varied between 0.77 and 0.91, which meant that internal consistency was either acceptable or very good. In other words, the measurement items were reliable enough to be used for data collection.

### 4.4 Ethical Considerations

All methods used for the process of collecting data are in compliance with the existing ethical standards that apply to survey-based research with human beings. Participation in the research is purely voluntary and the participants are made aware at the beginning of the questionnaire about the purpose of conducting the research, anonymity of their answers, and their right to opt out from the questionnaire without any form of penalty. All participants' data is kept confidential and accessible only to the researchers in a secure place. Use of online delivery technique guarantees voluntariness in responding to questions. All participants provide their informed consent at the beginning of the questionnaire by acknowledging the statement on ethical standards for this type of research. All these steps guarantee that ethical standards appropriate for academic research are met and data protection regulations appropriate for Malaysian studies are followed.

## 5. Data Analysis and Results

### 5.1 Measurement Model Assessment

Reliability, convergent validity, discriminant validity, and collinearity were analyzed during the measurement model assessment to verify the quality of all constructs applied in the study model. According to Hair et al. (2019) and Sarstedt et al. (2021), the assessment included outer loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), discriminant validity (Fornell-Larcker criterion and heterotrait-monotrait (HTMT)), and variance inflation factor (VIF).

As can be seen in Table 1, outer loading for all measurement items exceeded the accepted threshold of 0.70. The loadings' range was from 0.727 to 0.852, which means satisfactory reliability of all measurement indicators. Based on the recommendations by Hair et al. (2019), indicator loadings higher than 0.70 prove that items used in the study represent the corresponding latent variables sufficiently. In particular, the construct consumer skepticism toward sustainable brands (CS) had outer loadings of 0.775–0.852, whereas for green fatigue (GF), the range of values was from 0.727 to 0.848. Finally, the construct of green marketing message overload (GMMO) presented values of 0.788–0.835. It means that all measurement items made a significant contribution to their corresponding constructs.

Table 1: Reliability, Validity, and Outer Loadings

| Construct | Item | Outer Loading | Cronbach's Alpha | Composite Reliability (rho_a) | Composite Reliability (rho_c) | AVE |
|---|---|---|---|---|---|---|
| **CS** | CS1 | 0.852 | 0.901 | 0.905 | 0.924 | 0.669 |
| | CS2 | 0.775 | | | | |
| | CS3 | 0.798 | | | | |
| | CS4 | 0.833 | | | | |
| | CS5 | 0.801 | | | | |
| | CS6 | 0.845 | | | | |
| **GF** | GF1 | 0.820 | 0.884 | 0.886 | 0.912 | 0.635 |
| | GF2 | 0.842 | | | | |
| | GF3 | 0.727 | | | | |
| | GF4 | 0.792 | | | | |
| | GF5 | 0.848 | | | | |
| | GF6 | 0.743 | | | | |
| **GMMO** | GMMO1 | 0.835 | 0.899 | 0.902 | 0.922 | 0.663 |
| | GMMO2 | 0.791 | | | | |
| | GMMO3 | 0.814 | | | | |
| | GMMO4 | 0.831 | | | | |
| | GMMO5 | 0.788 | | | | |
| | GMMO6 | 0.828 | | | | |

In order to assess internal consistency reliability, Cronbach's alpha, rho_a, and rho_c were calculated. As seen in Table 1, Cronbach's alpha values exceeded the recommended value of 0.70 proposed by Cronbach (1951). Specifically, Cronbach's alpha was equal to 0.884–0.901, whereas the values of rho_a and rho_c were 0.841–0.885 and 0.912–0.924, respectively. Based on the data provided by Hair et al. (2019),

composite reliability between 0.70 and 0.95 shows acceptable reliability without redundancy among indicators. Therefore, the constructs used in this study are reliable.

As for convergent validity, it was checked through calculation of the AVE. According to the information presented in Table 1, the AVE values exceeded the minimum threshold of 0.50 recommended by Fornell and Larcker (1981) and ranged from 0.635 to 0.669. It is considered sufficient since the latent constructs explain more than 50% of the variance of their measurement items. To be precise, the AVE values for CS, GF, and GMMO were 0.669, 0.635, and 0.663, respectively. This proves that the latent constructs capture the variance of their measurement indicators successfully.

Discriminant validity was additionally verified through the analysis of the square root of AVE (Fornell-Larcker criterion) and HTMT ratio. As per the information in Table 2, all values on the main diagonal surpassed correlations with other constructs, thus satisfying the Fornell-Larcker criterion. Besides, the HTMT values were in the range of 0.539 to 0.688 and lower than the recommended level of 0.85 according to Henseler et al. (2015). As a result, there is clear evidence that the constructs used in the research model are valid and separate in terms of their conceptual meanings.

Table 2: Discriminant Validity Assessment

| **Fornell–Larcker Criterion** | | | | **HTMT Ratio** | | | |
|---|---|---|---|---|---|---|---|
| **Construct** | **CS** | **GF** | **GMMO** | **Construct** | **CS** | **GF** | **GMMO** |
| **CS** | **0.718** | | | **CS** | | | |
| **GF** | 0.587 | **0.697** | | **GF** | 0.656 | | |
| **GMMO** | 0.482 | 0.507 | **0.615** | **GMMO** | 0.539 | 0.688 | |

In order to check whether any multicollinearity existed in the research model, VIF was evaluated (see Table 3). As can be seen, VIF was between 1.678 and 2.539, being lower than the critical value of 5.0 recommended by Kock (2015). It proves that multicollinearity was not a problem, and there was no common method bias among measurement indicators. As a consequence, there is no threat to the validity of the measurement model used in the study.

Table 3: Collinearity Assessment of the Outer Model (VIF Values)

| **Construct** | **Item** | **VIF Value** | **Interpretation** |
|---|---|---|---|
| **CS** | CS1 | 2.474 | No collinearity issue |
| | CS2 | 2.163 | No collinearity issue |
| | CS3 | 2.389 | No collinearity issue |
| | CS4 | 2.528 | No collinearity issue |
| | CS5 | 2.098 | No collinearity issue |
| | CS6 | 2.435 | No collinearity issue |
| **GF** | GF1 | 2.411 | No collinearity issue |
| | GF2 | 2.389 | No collinearity issue |
| | GF3 | 1.775 | No collinearity issue |
| | GF4 | 2.084 | No collinearity issue |
| | GF5 | 2.539 | No collinearity issue |
| | GF6 | 1.678 | No collinearity issue |

| | | | |
|---|---|---|---|
| **GMMO** | GMMO1 | 2.335 | No collinearity issue |
| | GMMO2 | 2.006 | No collinearity issue |
| | GMMO3 | 2.111 | No collinearity issue |
| | GMMO4 | 2.275 | No collinearity issue |
| | GMMO5 | 2.030 | No collinearity issue |
| | GMMO6 | 2.353 | No collinearity issue |

All things considered, the results of the measurement model assessment proved the reliability, convergent validity, discriminant validity, and collinearity adequacy among the constructs used. Based on these results, the measurement model may be regarded as acceptable for conducting the next step of the research.

### 5.2 Structural Model Assessment

With the confirmation of satisfactory reliability and validity of the measurement model, the structural model was evaluated for collinearity issues, fit index values, $R^2$ values, and $f^2$ values, following the methodology set forth by Hair et al. (2019) and Sarstedt et al. (2021). The assessment includes the values of inner model VIFs, model fit indices, $R^2$, and $f^2$ values. Also, a diagram showing the relationships between the variables is presented in Figure 2.

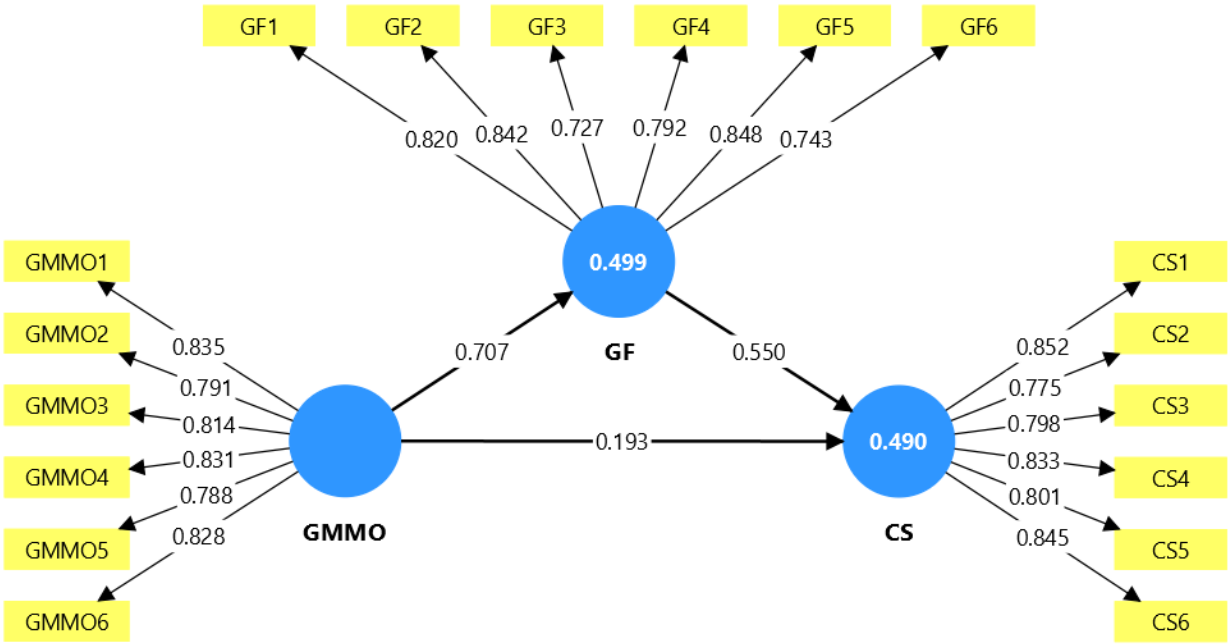


Figure 2: PLS Structural Model

To identify potential problems of multicollinearity, a review of inner model VIFs was conducted. According to the results obtained and presented in Table 4, all inner model VIFs range between 1.000 and 1.997, being far away from the threshold value of 5.0 recommended by Kock (2015). More specifically, for the relationships of GF to CS and GMMO to CS, VIF values are equal to 1.997, whereas the relationship GMMO to GF results in a VIF equal to 1.000. Thus, there is no problem of multicollinearity in the structural model.

Table 4: Collinearity Assessment of the Inner Model (VIF Values)

| Structural Relationship | VIF Value | Interpretation |
|---|---|---|
| GF to CS | 1.997 | No collinearity issue |
| GMMO to CS | 1.997 | No collinearity issue |
| GMMO to GF | 1.000 | No collinearity issue |

The goodness of fit was examined with the use of several global indices. Standardized Root Mean Square Residual (SRMR) for both saturated and estimated models is equal to 0.060, which is lower than the acceptable threshold of 0.08 proposed by Hair et al. (2019). Besides, Normed Fit Index (NFI) is equal to 0.857 and exceeds the threshold value of 0.80, which means that the overall fit of the model is satisfactory. Furthermore, discrepancy measures d_ULS and d_G are lower than 1.000 (0.607 and 0.315 correspondingly) and thus also indicate satisfactory fit because lower values mean smaller discrepancies between the empirical covariance matrix and model-implied one. Finally, the chi-square value equal to 171.507 can be considered satisfactory as long as in the case of PLS-SEM the focus is not made on absolute fit statistics but rather on predictive performance (Hair et al., 2019). It can thus be concluded that the model possesses acceptable fit and can be used for hypotheses testing.

Table 5: Model Fit Assessment

| Model Fit Index | Saturated Model | Estimated Model | Recommended Threshold | Interpretation |
|---|---|---|---|---|
| SRMR | 0.060 | 0.060 | < 0.08 | Good model fit |
| d_ULS | 0.607 | 0.607 | Lower values preferred | Acceptable fit |
| d_G | 0.315 | 0.315 | Lower values preferred | Acceptable fit |
| Chi-square | 171.507 | 171.507 | Lower values preferred | Acceptable |
| NFI | 0.857 | 0.857 | > 0.80 | Acceptable model fit |

The explanatory power of the structural model was determined with the help of the coefficient of determination ($R^2$). According to the values presented in Table 6, GMMO and GF jointly explain 49.0% of the variance of CS ($R^2 = 0.490$). On the other hand, GMMO explains almost half of the variance of GF ($R^2 = 0.499$). Following the recommendations of Hair et al. (2019), such low levels of $R^2$ values (close to 0.50) indicate satisfactory explanatory power and thus good model fit.

Finally, effect sizes of the relationships between constructs were estimated. As follows from Table 6, GMMO has a very strong impact on GF with the effect size being equal to 0.997. GF has a significant impact on CS with the effect size of 0.297. At the same time, the effect of GMMO on CS is rather small (effect size is equal to 0.036). With regard to Cohen's recommendations about effect size thresholds for small, medium, and large effects (0.02, 0.15, and 0.35 correspondingly), GMMO does not have any direct effect on CS while GF is an important mediator of such effects.

As it has already been mentioned, Table 6 presents the final PLS-SEM results and depicts the standardized path coefficients, outer loadings, and $R^2$ values of the endogenous constructs. The figure also shows that GMMO has a strong effect on GF with the standardized path coefficient equal to 0.707. On the other hand, GF has a significant influence on CS, with its standardized path coefficient being equal to 0.550. The direct influence of GMMO on CS can be considered comparatively insignificant as it is equal to 0.193. Thus,

green fatigue mediates the effect of green marketing message overload on consumer skepticism toward sustainable brands.

Table 6: $R^2$ and Effect Size ($f^2$) Results

| Relationship / Construct | R-Square ($R^2$) | Adjusted R-Square | Effect Size ($f^2$) |
|---|---|---|---|
| **CS** | 0.490 | 0.479 | |
| **GF** | 0.499 | 0.494 | 0.297 (GF to CS) |
| **GMMO to CS** | | | 0.036 |
| **GMMO to GF** | | | 0.997 |

### 5.3 Hypotheses Testing

The hypotheses presented above were tested using bootstrapping analysis performed in PLS-SEM to measure the importance and direction of the structural relationships among the latent variables. Following Hair et al. (2019), the importance of a relationship was measured with the help of path coefficients (β), t-values, and p-values. Results for the hypotheses' testing are provided in Table 7.

Table 7: Direct Hypotheses Testing Results

| Hypothesis | Structural Path | β (Original Sample) | t-Value | p-Value | Result |
|---|---|---|---|---|---|
| **H1** | Green Marketing Message Overload to Consumer Skepticism Toward Sustainable Brands | 0.193 | 1.501 | 0.133 | **Not Supported** |
| **H2** | Green Marketing Message Overload to Green Fatigue | 0.707 | 14.490 | 0.000 | **Supported** |
| **H3** | Green Fatigue to Consumer Skepticism Toward Sustainable Brands | 0.550 | 4.021 | 0.000 | **Supported** |

The first hypothesis expects a positive and statistically significant relationship between GMMO and CS. The results presented in Table 7 confirm a positive relationship between GMMO and CS with a positive beta coefficient ($\beta = 0.193$). However, the path is statistically insignificant ($t = 1.501$, $p = 0.133$). Therefore, Hypothesis 1 is rejected since consumer skepticism toward sustainable brands is expected to be positively influenced by the exposure to the excessive number of green marketing communications. The finding contradicts the expectations and indicates that consumers do not interpret green marketing communication as a manipulative attempt. It partly questions the validity of the Persuasion Knowledge Model, suggested by Friestad and Wright (1994). According to this model, persuasion should activate consumer skepticism. Alternatively, the result suggests that GMMO influences consumers' decision-making indirectly, by impacting cognitive-emotional processes in consumers.

In Hypothesis 2, the positive and statistically significant relationship between GMMO and GF was hypothesized. The results presented in Table 7 demonstrate a statistically significant beta coefficient ($\beta = 0.707$), with high statistical significance ($t = 14.490$, $p < 0.001$). The findings confirm the theoretical assumption suggested by Cognitive Load Theory, according to which information overload prevents

consumers from successful processing and causes adverse consequences for them (Sweller, 1988; Mayer & Moreno, 2003). Additionally, the finding supports the claims made by Eppler and Mengis (2004) and Roetzel (2019) about the influence of continuous exposure to excessive information on cognitive fatigue and information avoidance. In terms of green marketing, the findings support the conclusions of Peattie (2010) and Trudel (2019) concerning the influence of sustainability communication on consumer emotions.

In Hypothesis 3, a positive and significant impact of GF on CS was hypothesized. The results presented in Table 7 confirm the positive relationship with a statistically significant beta coefficient ($\beta = 0.550$, $t = 4.021$, $p < 0.001$). Theoretically, the finding supports the assumptions of the Persuasion Knowledge Model, according to which consumer defenses against persuasion are triggered by increased cognitive load (Friestad & Wright, 1994). Additionally, the finding supports research evidence from green marketing literature, according to which negative emotions elicited by green marketing communications influence perception of green brands and their green marketing messages (Leonidou & Skarmeas, 2017; Chen & Chang, 2013). In general, the direct tests confirm that green marketing communication does not influence consumer skepticism but affects consumer fatigue positively.

### 5.4 Mediation Analysis

The mediated effects were analyzed to assess the mediating role played by GF in the relationship between GMMO and CS. Based on the recommendations put forward by Preacher and Hayes (2008) and Hair et al. (2019), the significance of the indirect effect was estimated using a bootstrap approach in PLS-SEM. Mediation results are provided in Table 8, whereas the bootstrapped structural model is presented in Figure 3.

Table 8: Mediation Hypothesis Testing Results

| Hypothesis | Indirect Path | Indirect Effect (β) | t-Value | p-Value | Mediation Result |
|---|---|---|---|---|---|
| **H4** | Green Marketing Message Overload to Green Fatigue to Consumer Skepticism Toward Sustainable Brands | 0.389 | 3.718 | 0.000 | **Supported (Significant Mediation)** |

As demonstrated in Table 8 above, the indirect effect of GMMO on CS via GF was found to be statistically positive and significant ($\beta = 0.389$, $t = 3.718$, $p < 0.001$), providing the empirical support for Hypothesis 4. As can be seen, the indirect effect was found to be highly significant, which means that GF plays a significant mediating role in the relationship between GMMO and CS. In other words, exposure to excessive numbers of marketing messages in the context of sustainability creates feelings of exhaustion among consumers, thus increasing their skepticism toward sustainable brands.

It is essential to stress the need to interpret the mediation effect in light of the results obtained for the direct relationships between GMMO and CS and between GF and CS, which have been reported earlier in Table 7. Although no statistically significant correlation between GMMO and CS was found ($\beta = 0.193$, $p = 0.133$), the indirect relationship through GF proved to be statistically significant. Based on the guidelines established by Preacher and Hayes (2008) for assessing mediating effects, this implies that there is a full mediation process taking place in the studied relationship. In other words, GMMO affects the level of

skepticism toward sustainable brands not in terms of a direct cognitive reaction to communication but through the mediating effect of GF.

The mediation findings are consistent with the combined application of the theories of Cognitive Load and Persuasion Knowledge Model in relation to communication in the green marketing context. From the viewpoint of Cognitive Load Theory, repeated exposure to marketing messages in connection with sustainable consumption causes depletion of cognitive resources of consumers, resulting in fatigue and mental exhaustion (Sweller, 1988; Mayer & Moreno, 2003). Next, from the viewpoint of the Persuasion Knowledge Model, the state of mental exhaustion leads to consumers' heightened sensitivity to persuasive attempts on their behalf, triggering defensive evaluation mechanisms such as skepticism towards the messages received (Friestad & Wright, 1994; Campbell & Kirmani, 2000). Hence, GF can be regarded as a crucial mediating psychological process that translates message overload into skeptical consumer behavior.

Furthermore, the research findings are also in agreement with earlier literature that suggested that overcommunication in the context of sustainable consumption may lead to negative emotions and behaviors among consumers. Specifically, Peattie (2010) noted that moral pressure inherent in sustainability can cause reactions of disengagement and even resistance. Similarly, Moscardo and Pearce (2019) have referred to the phenomenon of eco-fatigue as an example of the negative impact caused by sustainability communication. Likewise, Trudel (2019) has pointed out the psychological costs related to green consumption. The current study provides further insights into the nature of the phenomenon discussed as a new empirical proof of the idea that fatigue caused by sustainability communication not only occurs but also impacts consumers' skepticism.

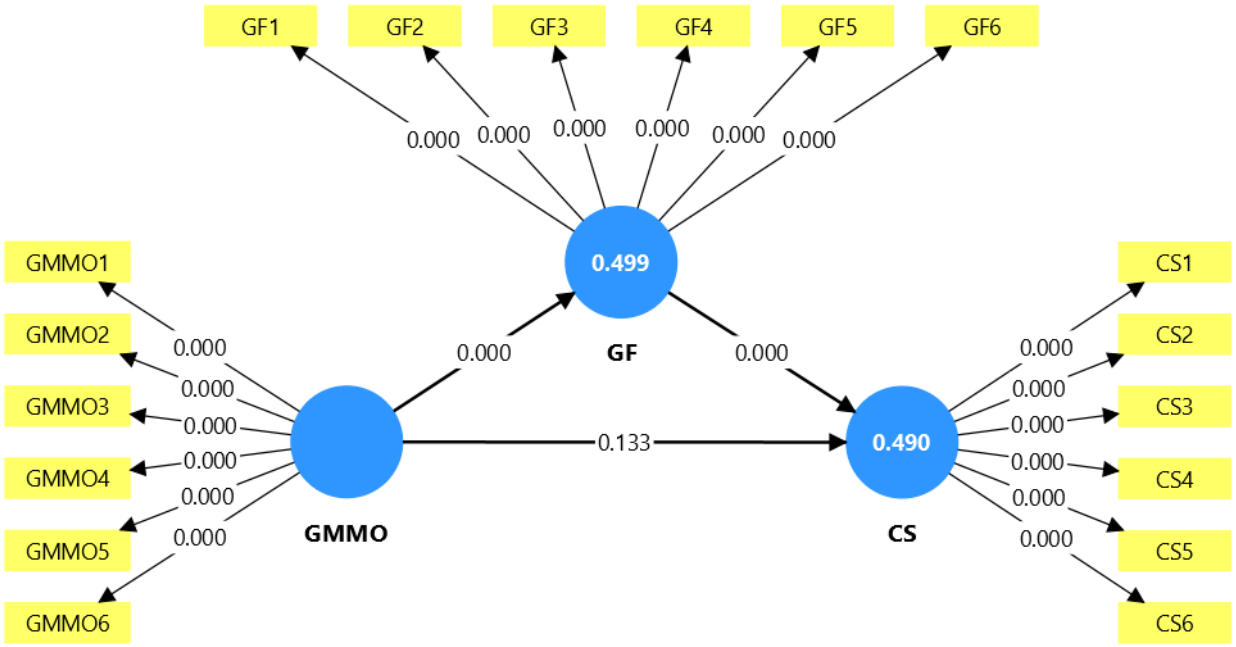


Figure 3: Structural Model with Bootstrapping Results

Finally, Figure 3 provides an additional confirmation of the mediation results through presenting the bootstrapping output of the structural model. The paths connecting GMMO with GF and GF with CS proved

to be highly statistically significant ($p < 0.001$), whereas the relationship between GMMO and CS remained insignificant ($p = 0.133$). Consequently, GF fully mediates the relationship between GMMO and CS.

## 6. Discussion

This paper explores the topic of green marketing message overload and its indirect impact on consumer skepticism. The results provide a number of interesting theoretical and practical implications. Firstly, the study found that there is no direct relationship between green marketing message overload and skepticism. Instead, consumer skepticism is caused indirectly via green fatigue – a psychological response. This result has theoretical importance since it means that the frequency of sustainability-oriented communication is unlikely to cause skepticism per se. Instead, consumers may feel cognitive and emotional exhaustion due to repetitive green communication and react with skepticism. Such finding adds to an expanding literature base on negative consequences of sustainability communication and advances the existing understanding of cognitive processes associated with repeated exposure to green marketing (Leonidou & Skarmeas, 2017; Peattie, 2010; White et al., 2019).

Finally, it is essential to note that there is no significant relationship between green message overload and consumer skepticism. Even though a positive influence was expected, Hypothesis 1 was not proven by the research since the correlation between variables was not statistically significant. This result partly contradicts the assumptions of the Persuasion Knowledge Model, according to which increased exposure to persuasion leads to consumer defensiveness and skepticism (Friestad & Wright, 1994; Campbell & Kirmani, 2000; Obermiller & Spangenberg, 1998). However, this conclusion becomes clearer within the context of modern practices in sustainable communication. Green messages might seem to be a natural and even expected part of a communication process in Malaysia and therefore not perceived as manipulative behavior of marketers. Over the last few years, sustainable communication has turned into an integral element of modern consumption, making it usual for a customer to receive several green messages throughout a day. Such a conclusion can be drawn based on the Green Consumer Theory that suggests that sustainability communication has its impact on a consumer on various levels including cognitive, social, ethical, and identity-related ones (Groening et al., 2018; Webb et al., 2008; Joshi & Rahman, 2015). Thus, sustainability communication can be positively accepted at the first stages of consumer behavior process.

Simultaneously, the significant influence between green marketing message overload and green fatigue serves as strong evidence in support of the Cognitive Load Theory. Namely, research results prove that constant receiving of messages related to sustainability implies serious cognitive and emotional efforts on the side of consumers. There is no need to suggest that Malaysians have negative experience regarding such a communication style. This might simply indicate that people are not capable of handling the information overflow. This idea corresponds with numerous studies proving that message overload negatively impacts information processing effectiveness and creates psychological stress (Jacoby et al., 1974; Eppler & Mengis, 2004; Roetzel, 2019). In addition, the phenomenon can become especially noticeable in digital spaces, where customers regularly come across messages related to ESG standards, eco-labels, etc. Therefore, the findings of the current study confirm the concept of green fatigue discussed by scholars before (Peattie, 2010; Trudel, 2019; Moscardo & Pearce, 2019).

Another important result is that green fatigue is positively related to consumer skepticism. Hence, the current study reveals the underlying mechanisms that explain how consumers develop skepticism. Previous

literature focused primarily on consumer skepticism as a response to misleading information, greenwashing, and incongruent communication (Delmas & Burbano, 2011; Nyilasy et al., 2014; Torelli et al., 2020). In contrast, the current study shows that consumer skepticism can also emerge without deliberate deception. Fatigue means that consumers are emotionally and mentally exhausted and therefore unwilling to process information. Under such conditions, consumer skepticism acts as an effective heuristic defense mechanism against too much green information. Thus, the result supports the Persuasion Knowledge Model, according to which the limited amount of cognitive resources promotes reliance on defensive heuristics (Campbell & Kirmani, 2000; Friestad & Wright, 1994; Obermiller et al., 2005). Therefore, the consumers' skepticism stems not from their critical attitude towards sustainability information but from the lack of cognitive and emotional abilities to assess the truthfulness of green messaging.

Theoretically, one of the most significant contributions of the paper is connected with the analysis of mediating effects. The study has found that green fatigue fully mediates the association between green marketing message overload and consumer skepticism. Hence, the results prove that green fatigue acts as a mechanism which makes it possible for message overload to cause skepticism. Such finding significantly expands the literature on green marketing where message quality, greenwashing, and credibility were always regarded as the main determinants of consumer skepticism (Mohr et al., 1998; Matthes & Wonneberger, 2014; Leonidou & Skarmeas, 2017). Instead, the paper shows that message quantity can also contribute to the emergence of skeptical attitudes, with green fatigue acting as an intermediary variable in the process. Theoretically, the paper reveals that Cognitive Load Theory and Persuasion Knowledge Model can be used together to understand how message overload leads to consumer skepticism in sustainability marketing.

The paper provides additional practical insight into the issue of sustainability communication in the age of digital technologies. Nowadays, consumers are bombarded with sustainability information on social media platforms, websites, advertisements, etc. Organizations tend to assume that more communication leads to higher levels of environmental awareness and better reception of sustainable messages. This interpretation is similar to those provided by researchers that discuss the decline of sustainability campaign effectiveness due to consumers' mental saturation (White et al., 2019). Similarly, Schmuck et al. (2018) found that excessive persuasion tends to backfire. This paper takes this discussion one step further and identifies the psychological mechanism (green fatigue) that enables message overload to cause consumer skepticism.

Finally, it should be noted that the paper enriches the green marketing literature by introducing data obtained from a non-Western sample of Malaysian consumers. Traditionally, academic literature has studied skepticism of consumers in developed countries (Leonidou & Skarmeas, 2017; Chen & Chang, 2013; Matthes & Wonneberger, 2014). Instead, the current study contributes to the limited knowledge of consumers from Southeast Asia. The findings show that rapid development of green markets in this region also causes psychological overload. Hence, future research should explore sustainability marketing issues among other developing regions as well. The paper provides the first step in this direction.

In general, the paper shows that sustainable marketing communication is not only an issue of what an organization says but how frequently it communicates its message. Marketers need to keep in mind that consumers have certain mental limitations. The excess of green marketing messaging, despite its accuracy, will eventually cause mental exhaustion and result in increased skepticism towards sustainable brands.

Thus, the paper shifts the focus of research from the "what" aspect of sustainability communication to the question of "how much."

## 7. Conclusion

In conclusion, the paper examines the effect of green marketing message overload on consumer skepticism toward sustainable brands, specifically paying attention to the mediating influence of green fatigue in the Malaysian setting. According to the findings, green marketing message overload is not directly associated with the degree of consumer skepticism; instead, the greater green communication intensity correlates with the higher incidence of green fatigue, which, in turn, leads to the increased consumer skepticism regarding sustainable brands. All things considered, the results confirm the hypothesis that negative consumer attitudes toward sustainability communication are caused by cognitive and emotional fatigue rather than opposition to green sustainability per se. In light of the integration of the Cognitive Load Theory, Persuasion Knowledge Model, and Green Consumer Theory, the proposed framework contributes to the existing knowledge base regarding the adverse effects of sustainability communication overload.

To summarize, the paper makes several theoretical contributions to the field of green marketing and consumer behavior. Firstly, the paper expands the existing knowledge on green skepticism by introducing communication overload as an antecedent to consumer skepticism. Studies have found that skepticism is provoked by such factors as greenwashing, misleading sustainability communication, and issues with credibility (Delmas & Burbano, 2011; Leonidou & Skarmeas, 2017; Nyilasy et al., 2014). However, the presented study has shown that excess communication concerning green sustainability is also able to spark consumer skepticism. Secondly, there is an identified gap in the literature addressed by the paper; namely, the introduction of green fatigue as a mediating construct rather than an adjective in the discussion of sustainability communication. The importance of introducing green fatigue as a separate construct has been emphasized in the works of Peattie (2010), Moscardo and Pearce (2019), and Trudel (2019). Thirdly, the paper contributes to the literature on Cognitive Load Theory and the Persuasion Knowledge Model in the area of green marketing by testing the two theories empirically. Fourthly, the study makes a contribution to the growing body of research on green marketing in Southeast Asian countries by exploring psychological reactions to sustainability communication in the Malaysian setting.

The findings of the study imply a number of practical recommendations for sustainability professionals. Specifically, organizations need to prioritize the quality of sustainability communication rather than its frequency. As suggested, communication overload will exhaust consumers and create a predisposition to being skeptical about green marketing communications. Thus, sustainable product marketing should provide trustworthy information to consumers in a concise way. It may make sense for organizations to use a fewer number of messages than frequent repetitions of the same one. At the same time, it is necessary to take into consideration consumers' emotional reactions to green communication. Ethical considerations cannot serve as the basis for marketing sustainable products alone; rather, sustainability campaigns should focus on creating emotionally appealing narratives. Considering the era of digital marketing, where sustainability information is disseminated through social media platforms and other digital tools, engaging sustainable branding campaigns that will not overcharge consumers is of paramount importance.

Although this study made several meaningful contributions to the literature, there are some limitations of the research that require mentioning. Firstly, due to its cross-sectional nature, this study does not allow us

to speak about the causality between the variables in question. Since consumers' skepticism and fatigue develop gradually upon long-term exposure to green communication, it is advisable to conduct longitudinal studies to explore their development. Secondly, the Malaysian consumers were selected as a sample; hence, the obtained results may not be extrapolated to other settings and nationalities; cross-cultural studies in different countries may reveal new insights regarding the reactions to sustainability communication. Thirdly, besides green fatigue, other mechanisms through which communication overload leads to the detrimental outcomes could be explored; thus, further investigation of alternative mediations, such as information avoidance, emotional disengagement, green erosion of trust, manipulative communication, etc., is required. Fourthly, the paper calls for conducting future studies of factors that moderate the relationships between green marketing message overload and consumer skepticism, such as environmental concern, awareness of sustainable development, age, and frequency of using digital media. Finally, apart from the volume of communication, its quality should also be taken into account.

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