Blockchain-Enabled Sustainability Communication: The Interplay of Emotional and Rational Consumer Responses

Abstract

Cognitive and emotional factors can influence the credibility of advertising and trust in sustainable communication. In this context, using blockchain to verify sustainability can make green communication more transparent and trustworthy and result in positive brand outcomes. This study involved developing and testing a theoretical framework using PLS-SEM, with N = 351 respondents from various generations and backgrounds. The results show that, although environmental involvement is not a significant predictor, a positive attitude towards sustainability has a positive effect on green advertising credibility and trust in sustainable products. Positive emotions linked to specific sustainability appeals strengthen trust, whereas negative emotions have no effect. Since a luxury brand was used as the stimulus, the results showed an improvement in brand attitude and affection after exposure to credible, blockchain-supported messaging. These findings suggest that emotional positivity and technological verifiability are essential for effective green advertising.

Keywords: Green advertising, Green Trust, Blockchain, Brand attitude, Brand affection

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Introduction

In recent times, corporate focus and research on sustainability and greenwashing have made it possible to describe the impact of such claims on consumers. Over the years, research has also verified the link between the identification of greenwashing, or the truthfulness and trustworthiness of companies' claims about product features or communication initiatives, also considering the consumer's environmental involvement, cognitive and affective processing (Schmuck et al., 2018). Given the trend toward greenwashing and the resulting recourse to greenhushing (Khan et al., 2025), many companies and brands are seeking alternative ways to implement sustainable initiatives and communications. One approach is to address supply chain sustainability through initiatives such as certifications, the use of blockchain, and widespread, diversified, and coherent initiatives to make the multiple sustainable choices of companies and brands visible. Particularly, blockchain (Cedrola et al., 2024) is redefining sustainable initiatives and communication by enabling radical transparency across global supply chains (Cheong, 2025). Blockchain-based systems (Sestino et al., 2022) facilitate real-time traceability of products from origin to point of sale (e.g., in the food industry; Ellahi et al., 2023), transforming sustainability reporting from static documentation to dynamic and interactive storytelling. The immutability of blockchain ledgers mitigates the risks of greenwashing, while QR codes and digital product passports provide consumers with direct access to verified environmental and social data. The aim of this paper is to examine how consumers' perceptions of brands are impacted by green advertising, from both a cognitive and emotional standpoint, particularly when these messages incorporate elements of concreteness, such as certification and the accessibility of the circular process facilitated by blockchain. In particular, the concept of proximity, reliability, and credibility of sustainable communications and green advertising is explored within the framework of Construal Level Theory (CLT) (Lee et al., 2024). Recent studies have tackled how the construal level—the way people interpret information as either abstract or concrete—affects advertising effectiveness (Gutentag & Russell, 2025). Abstract construals focus on values and desirability, while concrete construals emphasize specifics and feasibility. This distinction influences judgment and decision-making, including choices related to sustainable consumption.

In advertising, aligning the construal level of the message with the consumer's mindset, improves processing fluency and persuasion. For example, when a consumer's mindset (abstract vs. concrete) aligns with the message framing (future vs. present benefits), they evaluate products more positively (Chang et al., 2015). In our study, we therefore administered a survey to participants based on a promotional message relating to a line of jewellery from a well-known fashion brand, made with recycled gold certified using blockchain technology. This unique use of technology that provides access to certified and unalterable information enables all supply chain operators, particularly end customers, to verify the product's characteristics and the origin of the materials, preventing vague, misleading, and unverifiable communications.

The following provides an overview of consumer perception of sustainability communications and green advertising, focusing on emotions and rational reactions towards advertising of green products. This is followed by some notes on the survey analysis methodology and the PLS-SEM processing of the N=351 responses, providing implications and future research directions.

The rational processing of communication-related messages

Various studies that have attempted to understand the impact of sustainability communication on consumers have highlighted the simultaneous and joint influences of rational persuasion

and affective persuasion on attitude formation, as the subjective experience of emotion, as a type of cognition, is not inferior to rational cognition (Buck et al. 2004; Schmuck et al., 2018). In particular, messages about sustainability can be received and processed by consumers on a rational level through environmental involvement (Schmuck et al., 2018) as a combination of environmental knowledge and concern (Mohr et al., 1998). These two dimensions mainly derive from individuals' knowledge of and skepticism about environmental phenomena, their search for transparency, and their verification of facts. As a result, greenwashing is not always recognized as such by consumers, although growing social cynicism is helping to identify it more frequently (Policarpo et al., 2023). However, when consumers do recognize it, it undermines their trust in the brand (Chen 2010; Chen & Chang, 2013). On the other hand, Sander et al. (2021) assert that a brand personality with sustainable connotations strengthens the attitude towards the brand, since communication manages to be coherent and reinforce the idea of the brand as positive, especially in the aspect of sustainability linked to the environment, which is usually the one most visible and paid attention to by the consumer. We therefore propose that where consumers demonstrate a strong focus on sustainability issues, they
will respond positively to advertising campaigns promoting an environmentally friendly product, provided that these are supported by concrete and verifiable evidence.
We therefore put forward the following hypotheses:

H1 High attitude towards sustainability has a positive impact on advertising credibility.
H2 High attitude towards sustainability positively impacts on sustainable product (green trust).
H3 High Environmental knowledge positively impacts advertising credibility.
H4 High Environmental knowledge positively impacts on sustainable product (green trust).
H5 High Environmental concern positively impacts advertising credibility.
H6 High Environmental concern positively impacts trust on sustainable product (green trust).

Sustainability is often perceived as abstract due to its vague, complex, and poorly defined nature. This abstractness extends to green advertising, which frequently uses unclear or technical language (e.g., “eco-friendly,” “carbon neutral”) and references distant, future-oriented outcomes (e.g., “for generations to come”). Such messaging can make it harder for consumers to psychologically engage and act.
Researchers have applied Construal Level Theory (CLT) to improve green advertising effectiveness (Lee et al., 2024). These studies show that matching the construal level of message appeals with their framing enhances consumer response. For instance, abstract appeals work better when paired with abstract benefits, while concrete appeals are more effective when combined with loss framing, while abstract appeals pair well with gain framing to encourage sustainable behaviors like eco-product purchases and recycling (Gutentag & Russell, 2025). Therefore, we hypothesise that concrete appeals in green advertising can positively impact brand perception, in terms of attitude and affection.
H7 Advertising credibility has a positive impact on brand attitude and brand affection.
H8 Trust in sustainable products (green trust) has a positive impact on brand attitude and brand affection.

Consumers’ emotions towards sustainability communication
Emotional appeals play a pivotal role in enhancing the effectiveness of sustainability messaging, with research increasingly highlighting the nuanced impact of different emotions on pro-environmental behavior. Positive emotions such as hope, pride, and empathy have been shown to foster engagement and motivation (Pasca, 2022). For instance, pride and guilt

act as mediators between individuals' connection to nature and their intention to behave sustainably, suggesting that these emotions can reinforce a sense of personal responsibility and agency in environmental outcomes. Pride, in particular, has been linked to increased perceived consumer effectiveness, encouraging individuals to believe their actions can make a tangible difference (Antonetti & Maklan, 2014).

Conversely, guilt and shame, often categorized as negative moral emotions, can also be powerful motivators—though their use requires careful calibration. Rees et al. (2015) show that inducing a guilty conscience through messaging that highlights human-caused environmental damage can lead to both increased behavioral intentions and actual pro-environmental actions, such as signing petitions or making sustainable choices. However, excessive guilt may backfire, leading to defensiveness or denial, especially when individuals feel overwhelmed or powerless (Nielsen & Gamborg, 2024).

The way sustainability messages are framed can significantly influence emotional engagement and behavioral outcomes. Research comparing gain-framed and loss-framed messages reveals that while both can be effective, loss-framed messages—those emphasizing the negative consequences of inaction—often elicit stronger emotional reactions, particularly anticipated shame, which can motivate pro-environmental behavior. According to Amatulli et al. (2019), messages highlighting the harm caused by unsustainable choices tend to prompt individuals to act in ways that restore a positive self-image, especially when environmental concern is high and the product in question is not a luxury item. In addition, the structure of the message—whether it relies on narratives or statistics—also plays a crucial role in emotional impact. Previous research shows that story-based narratives, especially those with emotionally charged endings, are more effective than purely informational messages at fostering emotional arousal and pro-environmental action (Morris et al., 2019). This is attributed to the power of narrative and storytelling that reduce scepticism, while increasing empathy and engagement.

Finally, psychological distance affects how intensely people feel emotions about sustainability (Chang et al., 2015). In general, the more distant an event seems (in terms of time, space, or social relevance), the less intense the emotional response. Basic emotions (e.g., fear, anger) are linked to psychologically close threats, while self-conscious emotions (e.g., guilt, shame) often require a socially distant perspective, i.e., seeing oneself through the eyes of others (Ejelöv et al., 2018). Since a high-level interpretation (abstract thinking) of climate change can evoke stronger self-conscious emotions and weaker basic emotions than a low-level (concrete) interpretation (Chang et al., 2015), we propose that basic emotions have a stronger effect than self-conscious emotions in response to a sustainability message or green advertisement with a concrete framing provided by blockchain technology.

H9 Basic positive emotions are linked to a positive attitude towards concrete appeals in green advertising.

H10 Basic positive emotions are linked to positive evaluations in terms of trust towards the sustainable product (green trust).

H11 Basic negative emotions are linked to positive attitude towards concrete appeals in green advertising.

H12 Basic negative emotions are linked to positive evaluations in terms of trust towards the sustainable product (green trust).

Methods

The theoretical framework that emerges from the synthesis of the proposed hypotheses was tested using a series of psychometric measures and 1-to-5 Likert scales, which include the emotional dimension via the PANAS model (Watson et al., 1988). This construct entails basic emotions that have been selected as positive (joviality, self-assurance, attentiveness) and

negative basic emotions (fear, hostility, guilt), which had previously been identified by the CLT as relevant in concrete communication (Chang et al., 2015; Ejelöv et al., 2018). To measure cognitive processing, we used three adapted measures: Environmental knowledge (EK) and Environmental concern (EC) (Mohr, Eroglu & Ellen, 1998), along with Attitude towards sustainability (ATTSUS) (Jacobs et al., 2018). The central variables of the model are identified as trust in product sustainability, measured by Green Trust (GRTR) (Chen, 2010), and the perception of credibility of advertising content, measured by Ad Credibility (ADCR) (Chang, 2010). The model's output variables are defined as brand evaluation dimensions and measured with Brand Attitude (BATT) (Spears & Singh, 2004; Sander et al., 2021) and Brand Affection (BAFF) (Kumar et al., 2015). The variables relating to brand awareness, attitude and affection were administered both before and after viewing the video, to evaluate any deviations and variations. To prevent and test for possible collinearity, a CMV marker variable was also included (Pons et al., 2006).
The listed dimensions were all measured after viewing a video promoting Prada Eternal Gold, the jewellery line made from recycled gold certified by the Aura Blockchain Consortium[1] for luxury goods. The sample of N=351 respondents was recruited to complete the online questionnaire via direct invitation, social media posts, and e-mails to a varied target of consumers in terms of demographic and social background, in collaboration with Italian, British, and Korean university professors from the authors' research network. Data was processed and analysed with Smart PLS 4 for PLS SEM, following the literature on the estimation of structural models with medium sized samples (Chin et al., 2013; Hair et al., 2012; Hair et al., 2017).

Results

The sample of N=351 respondents shows a wide variety of ages, with a predominance of young adults and middle-aged respondents, who represent more than half the sample. The majority of respondents have a master's degree, and the majority are currently employed in various sectors or are students. With respect to the measurement model, among the antecedents, only the EC construct was excluded from the analysis because it did not pass the expected reliability and validity tests. All the others were considered to confirm or contrast the hypothesised relationships in the theoretical framework the hypotheses. The results of the SEM and bootstrapping analysis (N=5000) on the relevance and validity of the relationships among the investigated dimensions are summarized in Figure 1 and Table 1. The hypothesis of a positive influence of ATTSUS on GRTR and ADCR is confirmed by the positive and significant relationship, as is the relationship between positive basic emotions and the same constructs. The mediator variables had positive and valid relationships with the output variables BAFF and BATT, confirming the proposed hypotheses. Overall, the R^2 values show sufficient predictive power to allow for implications and conclusions regarding the validity and generalizability of the study.

[1] The Aura Blockchain Consortium was founded in April 2021 by a group of global leaders in the luxury sector. It is a collaborative initiative aimed at promoting the adoption of blockchain solutions worldwide for the luxury industry. The consortium welcomes luxury brands from every corner of the globe, offering greater transparency, traceability, and utility to consumers. https://auraconsortium.com/

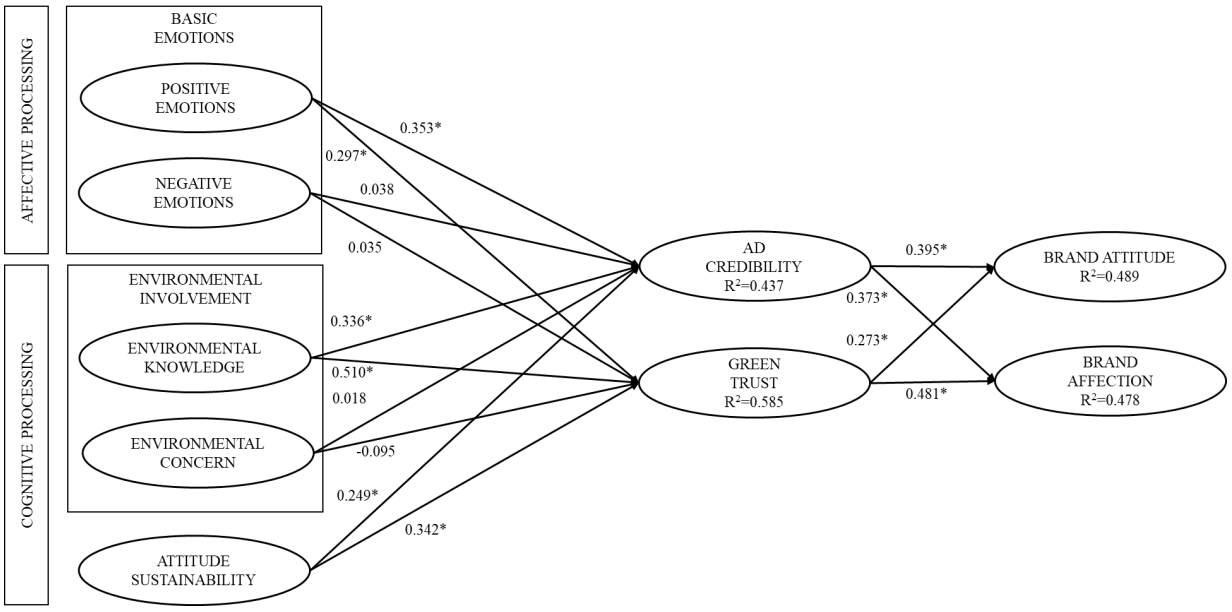
Table 1

Sample	351	100%
Age		
<18	36	11.29
19-34	98	30.72
35-49	54	16.93
50-64	105	32.92
>65	26	8.15
Gender		
Female	212	60.40
Male	130	37.04
Other/Prefer not to say	9	2.56
Study level		
No formal education	2	0.68
Completed elementary school	0	0.00
Completed middle school	39	13.31
High school diploma	63	21.50
Bachelor's degree (4-year)	33	11.26
Bachelor's degree (3-year)	44	15.02
Master's degree	108	36.86
PhD	4	1.37
Employment status		
Student	95	28.61
Unemployed	4	1.20
Employee	140	42.17
Self-employed	62	18.67
Family Business Worker	2	0.60
Collaborator	2	0.60
Part-Time Worker	2	0.60
Contract/Prioect based worker	5	1.51
Retired	19	5.72
Other	1	0.30

Table 2

H1 High attitude towards sustainability has a positive impact on advertising credibility.	Supported
H2 High attitude towards sustainability also positively impacts trust in sustainable product (green trust).	Supported
H3 High environmental knowledge positively impacts advertising credibility.	Not supported
H4 High environmental knowledge positively impacts trust in sustainable product (green trust).	Not supported
H5 High environmental concern positively impacts advertising credibility.	Not supported
H6 High environmental concern positively impacts trust in sustainable product (green trust).	Not supported
H7 Advertising credibility impacts positively with brand attitude e brand affection.	Supported
H8 Trust towards the sustainable product (green trust) impacts positively with brand attitude e brand affection.	Supported
H9 Basic positive emotions are linked to a positive attitude towards concrete appeals in green advertising.	Supported
H10 Basic positive emotions are linked to positive evaluations in terms of trust towards the sustainable product (green trust).	Supported
H11 Basic negative emotions are linked to positive attitude towards concrete appeals in green advertising.	Not Supported
H12 Basic negative emotions are linked to positive evaluations in terms of trust towards the sustainable product (green trust).	Not Supported

Figure 1



Implications for theory and practice

The theoretical model under study excludes the environmental concern (Schmuck et al., 2018) component from the significant antecedents of the credibility and trust variables. However, among the cognitive processing variables, the dimension of attitude toward sustainability is found to be valid (Jacobs et al., 2018). It can be deduced that people who care about sustainability, without necessarily being experts or concerned about the serious consequences for the environment and people, are indeed influenced to perceive an advertising message and the product it promotes as credible and trustworthy due to its green content. Regarding

emotional reactions, the results of the analysis confirm the CLT's proposal regarding sustainable communication messages with concrete appeal (Lee et al., 2024; Gutentag & Russell, 2025): that is, positive emotions are those that show a positive relationship with credibility and trust in the characteristics of the promoted product. Negative basic emotions, on the other hand, were not found to be a valid antecedent, and therefore it could be concluded that messages focusing on the negative consequences of environmental impact are less effective (Ejelöv et al., 2018; Chang et al., 2015). It is therefore unnecessary to invoke aspects of spatial, temporal, or empathic proximity where blockchain allows for additional concreteness of the concept of sustainability, thanks to the possibility of accessing information in a decentralized, verifiable, and incorruptible manner, with advanced digital tools.

Finally, the two dimensions of advertising credibility and trust in the green characteristics of the promoted product are positively related to both output variables, identified as brand attitude and brand affection (Chen, 2010; Chen & Chang, 2013; Sander et al., 2021). It should be noted that the material selected as stimulus for the study refers to a very well-known brand, clearly positioned as a luxury brand. Previous research has emphasized the possibility of a link with negative emotions such as guilt (Antonetti & Maklan, 2014; Pasca, 2022; Nielsen & Gamborg, 2024) or hostility, but this has not been verified. What is clearly evident, even when compared with the scores of the same variables, ex ante and ex post, seems to confirm that the brand may enjoy relative or low awareness of its commitment to sustainability, but that after watching the video, they show a positive attitude towards the brand and its ability to pursue sustainable initiatives and communications that are credible, reliable, and verifiable, also thanks to blockchain technology (Cedrola et al., 2024; Cheong, 2025).

This study has several limitations that suggest potential areas for future research. Using a well-known luxury brand as the stimulus may have influenced emotional responses and brand attitudes, which could limit the generalisability of the findings to less well-known or non-luxury brands. Future studies could explore the impact of sustainability messaging on different brand categories and levels of consumer awareness. Furthermore, while blockchain technology was shown to enhance perceived credibility through its verifiability, further research is needed to assess its use in isolation, independent of the circularity of the product, as this may produce different results.

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