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The Greenwashing Paradox: Signal Degradation and the Rise of Heuristic Substitution

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Abstract

The increasing number of sustainability claims may reduce the perceived reliability of formal eco-labels, creating an environment in which greenwashing can erode institutional trust. This study explores how consumers navigate significant information asymmetry when standardized environmental signals are absent. Using a qualitative research design, we conducted focus group discussions with Hungarian- and Romanian-speaking consumers in Transylvania, Romania, a multiethnic transitioning market. Computational text analysis, including topic modeling, was used to support this interpretive approach and effectively decode the complex typologies of green claim evaluation. The findings suggest that signal degradation among the participants was associated with culturally embedded heuristic substitution rather than a uniform rejection of green claims. Romanian-speaking participants described more analytical, information-seeking heuristics that are tightly integrated into routine purchasing decisions. Conversely, Hungarian-speaking participants articulated a looser connection between generalized skepticism and their purchasing routines. This study contributes to signaling theory and administrative science by suggesting that standardized governance tools may be less effective when they are not aligned with localized trust structures. Reconceiving greenwashing as a failure of signal fit rather than as deceptive marketing communication, the study contributes to a process-oriented understanding of how consumers evaluate sustainability claims under uncertainty. Future research should quantitatively test these heuristic pathways across diverse regulatory and cultural environments.

Keywords: greenwashing; signaling theory; heuristic substitution; consumer skepticism



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1. Introduction

The growing importance of sustainability in the global food industry has made environmental claims a key part of market competition (Bernini & La Rosa, 2024; Yang et al., 2020). Since sustainability attributes are strictly credence qualities that consumers cannot directly verify even after consumption (Nugraha et al., 2024; Grunert et al., 2014), this market is characterized by significant information asymmetry. To overcome this asymmetry, firms rely on product-level signals, such as eco-labels and sustainability claims, to communicate their environmental responsibility (Seele & Gatti, 2017; White et al., 2019). However, this dynamic has also intensified the prevalence of greenwashing, defined as

the use of misleading, exaggerated, or selectively disclosed environmental information (Bernini & La Rosa, 2024; Vangeli et al., 2023; Delmas & Burbano, 2011), placing immense pressure on firms, especially SMEs, to align their environmental, social, and governance (ESG) practices with their public image to avoid accusations of greenwashing (Kubalek & Kudej, 2025). Furthermore, the recent literature emphasizes that greenwashing has evolved into a systemic governance challenge across global supply chains (Cherono et al., 2025) and acts as a critical vulnerability that undermines ESG integrity and correlates with broader corporate corruption (Poiriazi et al., 2025).

A substantial body of literature has documented that perceived greenwashing (PGW) leads to consumer skepticism, consumer confusion, compromised brand authenticity, reduced trust, and lower purchase intentions (Nguyen et al., 2019; Szabo & Webster, 2021; Tu et al., 2024; Gupta & Singh, 2024; Balaskas et al., 2025; Apostolopoulos et al., 2025; Poulis et al., 2026). However, these findings largely reiterate established outcome patterns. Consequently, a distinct theoretical anomaly has emerged in the literature. According to classic signaling theory, the proliferation of sustainability signals should reduce information asymmetry and facilitate efficient market sorting (Spence, 1973; Lyon & Montgomery, 2015). However, the exact opposite has occurred. The overabundance of green signals has degraded their reliability, resulting in a widespread breakdown of consumer trust, causing valid and costly signals to be dismissed as greenwashing (Montero-Navarro et al., 2021; Tu et al., 2024). From an administrative science and public policy perspective, this signal degradation represents a significant governance failure. When formal regulatory mechanisms and standardized eco-labels lose their credibility, citizens must rely on informal, culturally embedded heuristics to navigate the market (Castro Santa & Drews, 2023; Torres-Peña et al., 2026).

Although existing models have provided valuable insights into the outcomes of perceived greenwashing, many remain primarily outcome-oriented. They pay less attention to the situated interpretive mechanisms through which consumers assess the credibility of green claims in everyday contexts (Apostolopoulos et al., 2025; Araújo et al., 2025).

The specific, micro-level mechanisms through which the signaling process breaks down remain insufficiently articulated. In other words, the literature explains the consequences of PGW, but it leaves unexplored the specific evaluative mechanisms and credibility heuristics that consumers use to determine whether a noisy signal represents genuine sustainability or deceptive greenwashing (Nugraha et al., 2024; Castro Santa & Drews, 2023).

This gap is particularly pronounced in transitioning and culturally heterogeneous markets, where institutional trust and market maturity vary significantly. In Transylvania, Romania, a multiethnic region characterized by linguistic diversity and uneven trust in formal certification systems, the evaluation of credence goods does not occur in an institutional vacuum (Borda et al., 2021; Dan & Jitea, 2024; Bădescu et al., 2025). Instead, sustainability signals are interpreted within complex, locally embedded credibility structures. Under these conditions of high uncertainty, consumers substitute formal institutional trust with distinct experiential and cultural heuristics, which fundamentally alter how environmental signals are processed (Torres-Peña et al., 2026; Castro Santa & Drews, 2023).

To address this theoretical anomaly, the present study shifts the analytical focus from the outcomes of greenwashing to the interpretive mechanisms that construct it. Instead of treating greenwashing as an inherent property of a firm's communication, this study conceptualizes it as a failure of signal interpretation, driven by a mismatch between corporate signaling and consumer credibility heuristics. Accordingly, the study addresses the following research question:

How do Hungarian- and Romanian-speaking consumers in Transylvania process the credibility of sustainability claims on food products, and which specific interpretive heuristics govern the transition from credible claims to greenwashing?

Drawing on qualitative data from six focus groups and complemented by computational text analysis, the study develops a conceptual framework explaining how sustainability signals are filtered through distinct interpretive orientations. The study contributes to the literature by firstly identifying the specific, contextually embedded heuristics that disrupt standard signaling mechanisms, secondly advancing a process-oriented understanding of how greenwashing perceptions are cognitively constructed, and thirdly extending the economics of credence goods into a multiethnic, transitioning European context characterized by low institutional trust.

2. Theoretical Framework

2.1. Perceived Greenwashing

Perceived greenwashing is best conceptualized as a consumer inference that environmental communication is misleading, exaggerated, vague, or selectively disclosed rather than reflective of substantive performance. This interpretation becomes especially consequential when sustainability cannot be verified at the time of purchase (Nugraha et al., 2024; Grinberga-Zalite et al., 2025; Hossain et al., 2025). In this context, PGW is more than just disliked advertising; it is a credibility assessment that undermines the informational value of sustainability cues (Sciortino et al., 2025; Montero-Navarro et al., 2021). The most consistent mechanism chain linking PGW to lower purchase intention involves two proximal processes: green skepticism and consumer confusion. First, PGW increases green skepticism (Obermiller et al., 2005), which mediates the negative relationship between greenwashing and green purchase intention. Green skepticism is sensitive to informational and knowledge-based factors (Nguyen et al., 2019; Gupta & Singh, 2024; Balaskas et al., 2025). Second, PGW increases confusion and perceived risk. In the context of food and beverages, greenwashing is associated with higher skepticism, concern, and confusion, which can result in avoidance intentions, such as avoiding a brand (Apostolopoulos et al., 2025; Zhang et al., 2018). Together, skepticism reduces belief in claimed benefits, while confusion and risk increase the perceived cost of making an incorrect choice, which pushes intention downward (Obermiller et al., 2005; Hossain et al., 2025). Supporting evidence suggests that the effects of PGW are often moralized and affectively charged. Perceived deception can trigger a breach of trust and reduce willingness to support the brand. However, brand loyalty can mitigate this effect, suggesting that relational capital may offset the consequences of suspected greenwashing (Shi & Omar, 2024). Other models suggest that negative emotions, such as embarrassment and hate, intensify punitive responses when greenwashing is perceived as intentional manipulation (Pizzetti et al., 2021). Two moderators are especially relevant for a Transylvanian focus. First, awareness and knowledge influence vulnerability and interpretation. Lower-awareness groups may be more susceptible to execution cues, while higher knowledge can lead to greater detection and stronger negative reactions when greenwashing is recognized (Nguyen et al., 2019; Balaskas et al., 2025; McLean & Ward, 2025; Grinberga-Zalite et al., 2025). Second, while brand loyalty may buffer negative effects through trust carryover, it can also heighten disappointment if expectations are violated (Shi & Omar, 2024; Hossain et al., 2025).

2.2. Sustainability as a Credence Quality and the Problem of Asymmetric Information

In order to understand the structural mechanisms of greenwashing, it is crucial to conceptualize environmental sustainability as an economic problem of asymmetric information rather than merely as a communication attribute (Seele & Gatti, 2017; Delmas &

Burbano, 2011). In the economics of information, product attributes are classified as search, experience, or credence qualities (Grunert et al., 2014). Search attributes (e.g., price, color) can be verified before purchase, and experience attributes (e.g., taste) are assessed after consumption. However, credence qualities cannot be directly verified by consumers, even after consumption (Nugraha et al., 2024; Grunert et al., 2014). Environmental and ethical dimensions of food production, such as organic farming practices, carbon footprints, and fair-trade labor, are essential credence goods (Grunert et al., 2014; de Sio et al., 2022). Since consumers cannot independently verify whether a product was genuinely produced using sustainable methods, there is a significant information asymmetry between producers and buyers (Seele & Gatti, 2017; White et al., 2019). According to foundational economic theory, such severe asymmetry, if left unmitigated, can lead to adverse selection, driving high-quality, genuinely sustainable products out of the market as consumers become unwilling to pay a premium for unverifiable claims (Delmas & Burbano, 2011; Lyon & Montgomery, 2015). Thus, the primary challenge of sustainability in consumer markets is not just effective communication, but also that of fundamentally resolving the economic friction caused by unobservable quality (White et al., 2019; Yang et al., 2020).

2.3. Signaling Theory, Signal Degradation, and Greenwashing

Markets rely on signaling mechanisms to overcome the information asymmetry inherent in credence goods, markets rely on signaling mechanisms (Seele & Gatti, 2017; Lyon & Montgomery, 2015). According to signaling theory, high-quality actors can distinguish themselves from low-quality actors by transmitting observable signals (Lyon & Montgomery, 2015). In the context of sustainable consumption, these signals usually appear as third-party eco-labels, corporate sustainability reports, or environmental claims on packages (Grunert et al., 2014; White et al., 2019). For a signal to be effective, it must be relevant to the underlying quality (signal fit) and costly or difficult for low-quality actors to imitate (Seele & Gatti, 2017; Delmas & Burbano, 2011). However, the rapid commodification of environmental communication has severely disrupted this signaling environment (Bernini et al., 2024; Yang et al., 2020). Greenwashing represents a systemic failure of signal costliness (Seele & Gatti, 2017; Delmas & Burbano, 2011). Because self-declared environmental claims and pseudo-labels are often inexpensive to produce and poorly regulated, the market is flooded with “noise” (Bernini & La Rosa, 2024; Vangeli et al., 2023). The proliferation of these false signals undermines the reliability of the entire signaling system (Montero-Navarro et al., 2021; Sciortino et al., 2025). Consequently, rather than reducing information asymmetry, the abundance of green signals paradoxically increases consumer skepticism, diminishes the value of legitimate costly signals, and leads to a generalized perception of greenwashing (Tu et al., 2024; Poulis et al., 2026; Gupta & Singh, 2024).

2.4. The Interpretive Gap: From Rational Processing to Credibility Heuristics

Spence’s (1973) signaling theory explains how signals operate at the market level by helping to distinguish higher-quality actors from lower-quality ones under information asymmetry. However, the effectiveness of any signal ultimately depends on how receivers interpret it. In consumer markets, particularly with regard to sustainability claims, this interpretation occurs at the individual level, where consumers must decide whether a signal is credible, relevant, and worth acting upon. When formal green signals are ambiguous, weakly verified, or widely imitated, they lose their diagnostic value. Under these conditions, consumers may shift from evaluating the formal signal itself to relying on alternative credibility cues that are easier to interpret in everyday purchasing contexts. Thus, signal degradation creates conditions in which individual-level heuristic processing becomes central to green claim evaluation. This assumption is a significant theoretical limitation when applied

to the micro-level realities of everyday consumption. The recent literature indicates that consumers rarely have the cognitive resources, institutional knowledge, or motivation to perfectly decode complex sustainability signals' validity (Tversky & Kahneman, 1974; Nugraha et al., 2024). Under conditions of high signal noise and unverifiable credence qualities, instead, consumers rely on interpretive heuristics to assess credibility (Chaiken, 1980; Ellen et al., 2006; Foreh & Grier, 2003; Castro Santa & Drews, 2023). The same environmental signal may be interpreted as a valid, costly indicator of quality by one consumer, and as deceptive greenwashing by another. This subjective meaning-making process depends heavily on the consumer's sociocultural and institutional context (Cacioppo et al., 2018; Torres-Peña et al., 2026). In this study, we use the term "heuristic substitution" to describe a specific form of cue-based evaluation under uncertainty. In cognitive and consumer behavior research, heuristics are commonly understood as simplified judgment rules or cue-based shortcuts used when individuals are faced with uncertainty, limited information, or limited motivation to process complex messages systematically (Tversky & Kahneman, 1974; Chaiken, 1980; Cacioppo et al., 2018). Dual-process perspectives, including the heuristic-systematic model and the elaboration likelihood model, suggest that when detailed evaluation is difficult or costly, individuals may rely on source cues, familiarity, prior experience, affective impressions, or other easily accessible indicators (Chaiken, 1980; Cacioppo et al., 2018; Ellen et al., 2006; Foreh & Grier, 2003). In the context of sustainability claims, this difficulty intensifies because environmental attributes function as credence qualities that consumers cannot directly verify. Heuristic substitution refers to the process by which consumers replace ambiguous or distrusted formal sustainability signals, such as eco-labels or generic green claims, with alternative credibility cues that are easier to evaluate, socially familiar, or experientially grounded. These cues may include perceived product quality, origin, producer familiarity, brand experience, price-quality inferences, ingredient simplicity, certification clarity, or trust in known or local producers.

2.5. Conceptual Framework and Research Propositions

Drawing from the intersection of signaling theory and consumer heuristics, this study posits that the perception of greenwashing is not an objective response to a deceptive claim; rather, it is the result of a cognitive filtering process. When consumers encounter a plethora of ambiguous, low-cost, or weakly verified green claims, the credibility of formal sustainability signals becomes more difficult to discern. Consequently, consumers may become more cautious about accepting sustainability signals and approach unverifiable claims with greater skepticism (Farooq & Wicaksono, 2021).

RP1—Signal Degradation: In markets with high environmental signal noise, consumers are likely to be more skeptical of unverifiable sustainability claims, especially when formal signals lack clarity, perceived costliness, or trusted institutional backing.

Furthermore, standard economic models assume that institutional signals (e.g., government-backed or EU-certified eco-labels) are universally costly and valid. However, in transitioning markets characterized by institutional fragility and uneven trust in formal authorities—such as the multiethnic Transylvanian context (Borda et al., 2021)—formal signals lose their separating power. If consumers do not trust the certifying institution, the signal is perceived as "cheap" and decoupled from actual quality. Under these conditions, consumers may shift from institutionally supplied sustainability signals to credibility cues that are more accessible, familiar, or personally verifiable. This substitution does not imply the random use of cues; rather, it reflects a cognitively economical response to uncertainty, in which consumers rely on cues that appear more meaningful in their everyday purchasing context (Grunert et al., 2014; Torres-Peña et al., 2026).

RP2-Heuristic Substitution: When formal sustainability signals are ambiguous, weakly verified, or not trusted by institutions, consumers may rely on alternative credibility cues, such as origin, familiarity with the producer, ingredient simplicity, prior experience, perceived quality, or inferences about the price–quality ratio, to evaluate the credibility of green claims.

The selection and weighting of these substitute heuristics are not random. Rather, they are deeply embedded in consumers' sociocultural and linguistic frameworks (Dan & Jitea, 2024). Meaning-making is a socially constructed process. Therefore, different ethno-linguistic groups coexisting within the same geographic and economic market may not uniformly evaluate degraded signals. They will draw upon distinct cultural narratives and knowledge structures to define what constitutes a “credible” versus a “deceptive” claim.

RP3-Cultural Embeddedness of Interpretation: The activation and prioritization of credibility heuristics may be shaped by sociocultural and linguistic contexts. Consequently, ethno-linguistic consumer groups within the same macroenvironment may display different dominant interpretive orientations when constructing perceptions of greenwashing.

These three propositions form the theoretical framework of the study, shifting the analytical focus from the mere outcomes of greenwashing to the localized, heuristic-driven mechanisms that actively construct it.

Thus, the literature highlights that green claims in food consumption primarily function as credence attributes. This requires consumers to rely on interpretive processes and indirect signals when assessing credibility. Perceived greenwashing is not an objective condition but rather a context-dependent judgment shaped by interpretive orientations, credibility heuristics, and sociodemographic factors. Previous studies have revealed systematic variations in the evaluation of sustainability information, particularly in different cultural and linguistic contexts. These variations influence trust formation and purchasing decisions (Hajdú et al., 2018; Borda et al., 2021; Dan & Jitea, 2024; Bădescu et al., 2025; Balaskas et al., 2025). Additionally, structural conditions such as institutional trust, price sensitivity, and local credibility cues further shape these evaluations in emerging and transitioning markets. Overall, the literature emphasizes the critical need for a process-oriented, context-sensitive framework to better understand how perceived greenwashing develops in everyday consumption settings. To empirically investigate these theoretical propositions and capture the nuanced, culturally embedded heuristics that standard quantitative models may not fully capture, an inductive, qualitative methodological approach is required. Rather than establishing causal relationships, this study provides an interpretive account of how consumers understand sustainability claims in uncertain situations.

3. Materials and Methods

3.1. Research Design and Contextual Framework

This study uses an interpretivist approach to examine how consumers interpret perceived greenwashing and how these interpretations influence purchasing decisions. Unlike the scale-based quantitative approaches that dominate greenwashing research (Apostolopoulos et al., 2025; Araújo et al., 2025), this study employed an exploratory qualitative research design with focus group interviews (FGIs) to capture individual and social interpretations. Following an inductive analytical logic, patterns emerged through qualitative content analysis (Elo & Kyngäs, 2008) and reflexive thematic analysis principles (Braun & Clarke, 2021; Byrne, 2022; Tracy, 2010). The study was conducted in Transylvania, Romania, a culturally and linguistically diverse region where the coexistence of Hungarian and Romanian populations provides a distinctive post-socialist context for examining sustainability-related attitudes

(Bădescu et al., 2025). Data collection took place between January and September 2025, supporting a structured cross-cultural interpretive comparison. Integrating computational text analysis with qualitative evaluation aligns with recent methodological directives that advocate using content analysis to measure and decode complex greenwashing typologies (Janik & Ryszko, 2026). We quantitatively verified the structural validity and semantic density of the thematic models using two established diagnostic metrics: probabilistic topic coherence and log-likelihood perplexity. This ensures that the qualitative themes are supported by robust statistical properties.

3.2. Sampling, Participants, and Data Collection

We employed a multi-stage sampling strategy combining self-selection, criterion-based, and purposive sampling to recruit participants via social media using an online screening questionnaire. Participants were required to be at least 18 years old, regularly purchase food, and possess basic sustainability awareness to be included in the study. To ensure heterogeneity in gender, age, and residence (urban vs. rural), participants were selected according to maximum variation principles.

The final sample consisted of 40 participants across six focus groups: four Hungarian-language groups and two Romanian-language groups. Group sizes ranged from six to eight participants. The two linguistic subsamples were not designed to support statistical representativeness or a fully symmetrical comparison. Rather, they provided a basis for an interpretive comparison of the two linguistic subcontexts within the same regional market.

Despite the difference in the number of focus groups between the Hungarian- and Romanian-speaking subsamples, the comparison was supported by three considerations. First, the total number of participants and the overall corpus size enabled the identification of recurring interpretive patterns in both linguistic segments. Second, data saturation was reached earlier in the Romanian subsample, partly due to the participants' more homogeneous professional backgrounds. Third, computational density checks, including tokens per participant, showed no substantial difference in verbal productivity between the two linguistic segments. These checks were not used to claim strict symmetry between the subsamples but rather to support a cautious comparative interpretation of dominant patterns across the two linguistic contexts.

Data saturation—the point at which no new codes or themes emerge—was clearly observed after the third Hungarian-language group. This aligns with prior research indicating that 80–90% of thematic content typically emerges within the first three groups (Guest et al., 2017). Subsequent groups were conducted to validate emerging patterns and ensure robustness across linguistic segments (Johnson et al., 2020; Guest et al., 2020).

Data were collected via online focus groups on Google Meet. This format provides interactional depth comparable to face-to-face sessions while increasing accessibility (Olawade et al., 2025). The focus groups followed a semi-structured moderator guide designed to elicit spontaneous associations and reflective evaluations of sustainability-related consumption. The guide combined open-ended discussion prompts with structured elicitation tasks, including word association exercises, ranking tasks, and scenario-based questions concerning food purchases. This structure allowed for comparability across focus groups while enabling participants to elaborate on their meanings, examples, and experiences.

The main thematic blocks covered participant introductions, food purchasing habits, environmentally conscious consumption, associations with greenwashing, product-specific purchasing motivations, and perceived future challenges. Appendix C provides a concise overview of the moderator guide. Appendix A provides a detailed overview of the sample's demographic composition.

3.3. Data Preparation and Computational Analysis

All sessions were audio-visually recorded and transcribed using AI-assisted tools. Then, a “human-in-the-loop” approach was used to manually verify the transcripts and capture linguistic nuances and implicit meanings (Olawade et al., 2025). To ensure semantic equivalence across the bilingual datasets, a cross-lingual verification protocol was used. AI-assisted translations were back-translated by bilingual researchers. Next, a “conceptual mapping” phase occurred in which lemmatized terms in both languages were manually harmonized into uniform conceptual lemmas. This ensured that cross-cultural comparisons were based on identical semantic constructs. Regarding quotations, the authors translated all participant quotations included in the Results Section into English and checked them for semantic equivalence against the original Hungarian and Romanian transcripts.

Data processing and statistical analyses were conducted using R 4.2.3. The analyses used software with the tidyverse, tidytext, quanteda, and igraph packages. The raw transcripts underwent a language-specific natural language processing (NLP) pipeline using the udpipe package to tokenize, part-of-speech tag, and lemmatize the corpora. The analysis was restricted to nouns, verbs, and adjectives. Context-specific stopword lists and synonym mapping standardized overlapping concepts into uniform lemmas. We explored initial lexical landscapes through term frequencies, followed by word co-occurrence networks built via widyr to map semantic relationships and identify central discourse nodes unique to each group.

Additionally, latent Dirichlet allocation (LDA) topic modeling, utilizing the topic-models package, uncovered latent thematic structures by identifying four distinct, non-overlapping themes ($k = 4$) for both subsamples. The selection of $k = 4$ was mathematically optimized using the ldatuning package and metrics proposed by Griffiths and Steyvers (2004), Deveaud et al. (2014), Cao et al. (2009), and Arun et al. (2010). As detailed in Appendix B and illustrated in Figures A1 and A2, $k = 4$ represented the optimal inflection point for both samples. At this point, topic distinctiveness reached stability (Deveaud et al., 2014) and information divergence was minimized (Cao et al., 2009). This ensured parsimony without sacrificing thematic complexity. Finally, a lexicon-based sentiment analysis evaluated the narratives’ attitudinal valence using custom bilingual dictionaries. Net sentiment scores were descriptively used to explore broad patterns of attitudinal valence across age group, gender, and residence without treating these subgroup comparisons as inferential or intersectional analyses. To validate the sentiment analysis, the custom lexicon was tested against manual coding of the entire population. Reliability was confirmed via Cohen’s kappa (κ) (Cohen, 1960) and bootstrapped stability checks (100 iterations). The results were interpreted according to the benchmarks established by Landis and Koch (1977).

3.4. Research Rigor, Ethics, and AI Use

The study adheres to the qualitative rigor criteria of credibility, dependability, confirmability, and transferability. The study aims for analytical generalization rather than statistical generalization (Nowell et al., 2017; Tong et al., 2007; Tracy, 2010; Ahmed, 2024). Credibility was strengthened through pilot testing, iterative analysis, and integrating qualitative and computational approaches. Researcher reflexivity was addressed through a neutral, non-directive moderation approach and a team-based analytical process. Focus groups were conducted by a linguistically and culturally competent moderator who was fluent in both Hungarian and Romanian and familiar with the Transylvanian context. This insider position supported rapport building and interpretation of culturally specific meanings. The involvement of three additional researchers with more external analytical positions helped question taken-for-granted assumptions and reduce the risk of interpretive bias from a single researcher. The same semi-structured moderator guide was used across

claims are critically interpreted within a broader understanding of market practices rather than simply assessed. In the Romanian sample, skepticism emerged through conditional evaluation based on evidence; in the Hungarian sample, it manifested as a more diffuse, systemic distrust. Although dominant tendencies were observed, both interpretive modes appeared across groups. This indicates that these patterns should be understood as contextually shaped orientations rather than fixed group characteristics. These orientations are not mutually exclusive, but rather, they represent prevailing patterns within each linguistic context. The structural validity of these interpretive modes was supported via latent Dirichlet allocation (LDA) diagnostics. The Hungarian thematic model achieved a mean coherence score of 0.097 and a perplexity score of 79.98, with individual topic scores of 0.122, 0.096, 0.045, and 0.124 for Topics 1, 2, 3, and 4, respectively. The Romanian model yielded a mean coherence of 0.017 and a perplexity of 130.43, with individual scores for topic 1 of -0.044, topic 2 of 0.057, topic 3 of 0.031, and topic 4 of 0.026. These metrics suggest that the identified clusters represent coherent semantic concepts rather than random word co-occurrences.

4.2. Sources of Credibility and Trust Formation

These distinct interpretive modes seem to influence how consumers try to overcome information asymmetry and establish credibility. As our conceptual framework outlines, when institutional trust is fragile, consumers may substitute formal signals with localized cues. Our analysis indicates that heuristic substitution takes fundamentally different forms across the two groups and is deeply intertwined with their analytical or reflexive orientations.

In the Romanian-speaking group, credibility is derived primarily from informational clarity and transparency. Participants emphasize the importance of clear labeling, accessible product information, and coherent communication. Trust tends to be established when claims are perceived as understandable and sufficiently detailed. This suggests that credibility is evaluated based on the internal consistency and structure of information. This conditional trust was particularly evident in relation to certification. One Romanian-speaking participant noted: *"I try to look for certifications, but I also understand the skepticism. If it is not clear who certified it and what the certification means, then it's just a word on the packaging"* (translated from Romanian). At the same time, this reliance on information is accompanied by a form of conditional skepticism. Vague, overly simplified, or promotional claims tend to trigger suspicion, indicating that credibility must be actively established through communication rather than being assumed.

Reflecting their reflexive orientation, the Hungarian-speaking groups appeared to rely more strongly on tangible and experiential cues. Participants frequently refer to product quality, familiarity, and prior experience when discussing trust. Among Hungarian-speaking participants, credibility was often grounded in prior experience, locality, and personal knowledge of producers. One participant explained: *"Where there is a local producer, a good acquaintance or friend, and a real quality option nearby, we are happy to buy from them"* (translated from Hungarian). Thus, credibility is grounded less in formal communication and more in perceived authenticity, which is often linked to concrete product characteristics or personal knowledge. These findings suggest that credibility is constructed through different evaluative logics in the two groups. These differences in credibility construction are further reflected in the structural organization of the discourse (see Figure 2).

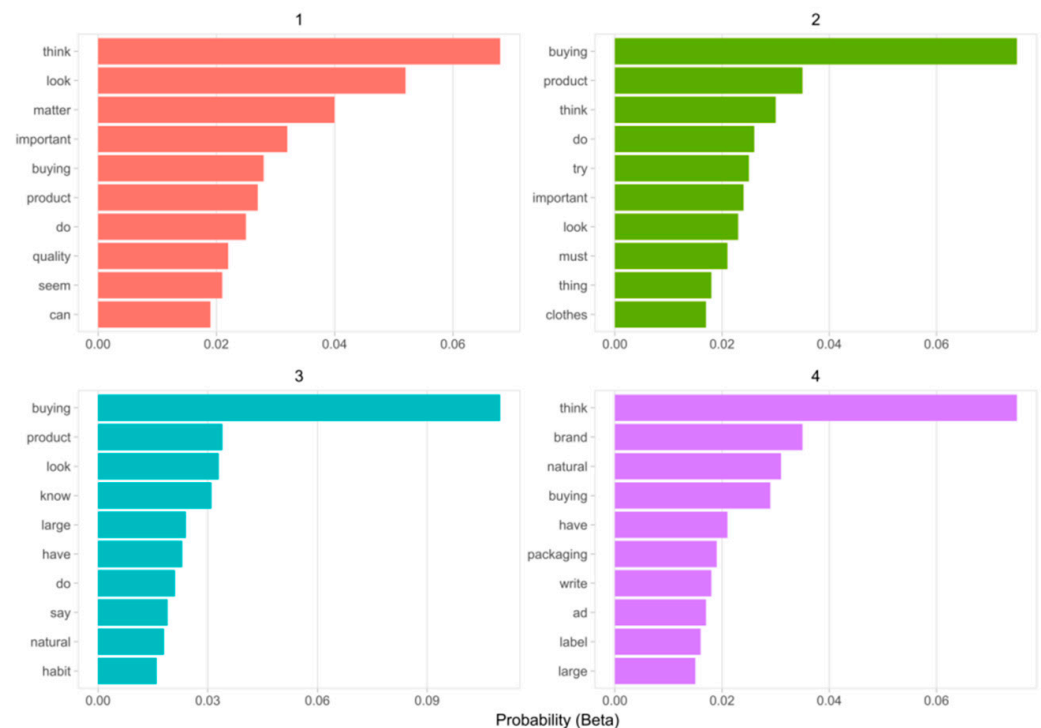


Figure 3. Latent thematic structure (LDA) of green claim evaluation (Romanian sample). Numbers 1–4 indicate the four latent topics identified by the LDA model. Colors are used to visually distinguish the topic clusters and do not represent separate variables. Bars show the highest-probability terms within each topic.

Conversely, the experiential heuristic system observed among Hungarian speakers indicates a more loosely coupled relationship between evaluation and purchasing. Sustainability-related judgments are often expressed at a general or reflective level and are not consistently applied to actual purchase decisions. Participants describe sustainability as an ongoing concern; however, this concern does not always translate into concrete evaluation practices at the point of purchase. One Hungarian-speaking participant's comment reflects this distance between concern and constant verification: *"You simply do not have the energy to read and investigate everything all the time. The brain does not have the capacity to take in so much information and decide what is really real"* (translated from Hungarian).

Figure 4 illustrates the LDA model for the Hungarian-speaking sample, which highlights a different thematic orientation. In this model, text clusters center on generalized attitudes and protective behaviors, such as reflexive skepticism and brand avoidance, which maintain a structural distance from routine shopping acts. Although "shopping" is a highly dominant term in the second topic, it clusters with "conscious" and "online", and "order" contexts, suggesting a more distant or planned relationship with the physical act of grocery shopping. Furthermore, the fourth topic introduces specific, value-based clusters such as "egg," "high-quality," and "farmer". This indicates that, for this group, evaluation is often tied to pre-existing trust in specific sources or quality categories rather than a real-time scrutiny of green claims. A high coherence score of 0.124 for topic 4 (source-based trust) indicates that source-based trust is the most robust cognitive framework in the Hungarian data within this sample.

Comparing the clusters in Figures 3 and 4 reveals these structural differences, suggesting that the degree of integration between evaluation and purchasing varies notably across the two groups. While Romanian-speaking consumers tended to embed credibility assessment within routine decision-making, Hungarian-speaking consumers maintained a greater distance between reflective judgment and purchasing behavior. This structural

difference in the Hungarian sample may indicate that, for them, sustainability remains a “background” concern that is only activated under specific conditions. For Romanian speakers, however, it functions as a “foreground” task of the shopping process itself.

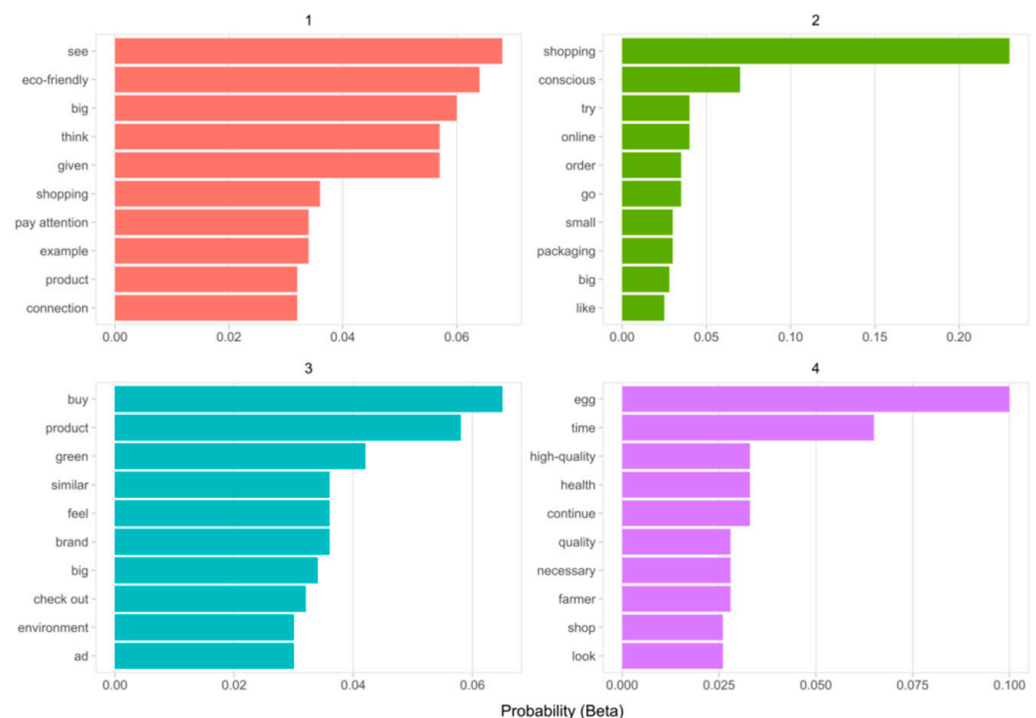


Figure 4. Latent thematic structure (LDA) of green claim evaluation (Hungarian sample). Numbers 1–4 indicate the four latent topics identified by the LDA model. Colors are used to visually distinguish the topic clusters and do not represent separate variables. Bars show the highest-probability terms within each topic.

4.4. Sociodemographic Variations in Skepticism

Culturally embedded heuristics appear to dictate the primary pathways for interpreting degraded signals. However, these overarching cultural patterns are not entirely homogeneous. Within both ethno-linguistic groups, perceptions of greenwashing are further nuanced by sociodemographic factors, adding a secondary structural layer to the aforementioned cognitive processes. In the Romanian-speaking sample, skepticism appears to be primarily structured by the interaction between gender and place of residence. Certain demographic segments exhibit relatively higher acceptance of sustainability-related communication, while others are more critical. These variations suggest that analytical, information-based evaluations do not lead to uniform skepticism, but rather interact with contextual factors that shape trust and interpretation. These patterns are also reflected in the distribution of sentiment across demographic groups (see Figure 5).

A different pattern emerges in the Hungarian-speaking sample. Here, skepticism is more clearly divided by generation and gender. Younger participants generally express greater openness toward sustainability claims, while older participants are more skeptical. At the same time, variability across groups indicates that attitudes are context-dependent rather than uniformly distributed. Taken together, these findings suggest that greenwashing-related skepticism does not have a universal structure, but rather emerges through context-specific demographic configurations.

To validate the sentiment analysis, a formal framework was applied. For the Hungarian sample ($N = 46$ matches), the lexicon achieved an accuracy of 93.48% and a Cohen's kappa of 0.858. For the Romanian sample ($N = 105$ matches), the accuracy was 92.38%,

with a Kappa of 0.79. Furthermore, bootstrapped stability checks (100 iterations) yielded 95% confidence intervals of [0.522, 0.804] for the Hungarian sample and [0.705, 0.857] for the Romanian sample, supporting the observation that the reported sentiment trends are statistically stable within these samples. The disparity in the number of tagged instances (105 Romanian versus 46 Hungarian) reflects three potential factors. First, the discursive mode: Romanian speakers' analytical orientation favored concrete adjectives, which the lexicon easily captured. In contrast, Hungarian reflexive narratives relied on complex metaphors, which were less susceptible to keyword-based tagging. Second is verbal productivity: Romanian sessions featured highly expressive participants who generated a greater volume of tokens despite fewer sessions. Third, the difference in linguistic structure: Romanian is a Romance language that uses explicit adjectival modifiers to express sentiment. In contrast, Hungarian agglutinative morphology embeds valences within complex suffixes, resulting in fewer direct dictionary matches during automated lemmatization.

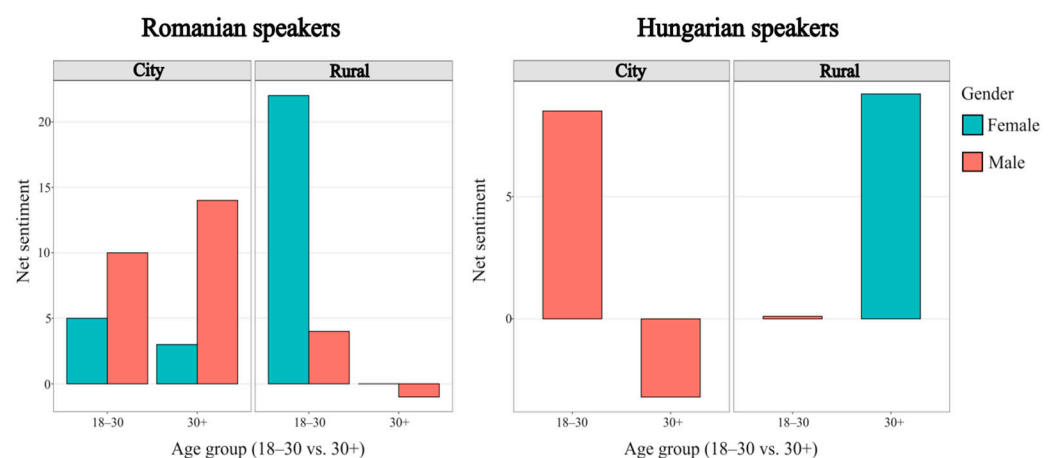


Figure 5. Sentiment analysis based on age, resident and gender variables.

4.5. Integrative Pathways of Green Claim Interpretation

In synthesizing these findings, the analysis suggests that green claims follow distinct interpretive pathways in the two groups. In the Romanian-speaking group, the evaluation process is analytical. Consumers tend to rely on product-level information, apply informational heuristics, and integrate credibility assessment into their purchasing practices. A Romanian-speaking participant succinctly summarized this information-dependent trust logic: *“If I don’t see clear information, I prefer not to believe it immediately”* (translated from Romanian). Within this pathway, perceived greenwashing primarily emerges through the identification of inconsistencies or ambiguities in communicated information. In contrast, the Hungarian-speaking group exhibits a reflexive pathway, in which evaluation is grounded in broader interpretive reasoning, experiential heuristics, and generalized skepticism toward sustainability communication. In the Hungarian-speaking sample, experiential authenticity was sometimes articulated through direct personal control over production. As one participant put it: *“To me, organic means going to the garden and pulling out a carrot myself or slaughtering a pig we fed and produced the grain for”* (translated from Hungarian). Here, perceived greenwashing is constructed less through specific, product-level discrepancies and more as a systemic feature of market practices. These pathways demonstrate how green claims are interpreted based on the interaction between interpretive orientation, credibility heuristics, and contextual factors in this region. Rather than being a direct response to green claims, perceived greenwashing emerges as the outcome of these interconnected processes.

5. Discussion

5.1. Overcoming Signal Degradation Through Heuristic Substitution

The present study addresses the theoretical challenge of applying classic signaling theory to markets with degraded environmental signals. Although signaling theory explains how signals can reduce information asymmetry at the market level, our findings suggest that consumers' interpretations of these signals were influenced by localized credibility cues and their reported everyday purchasing routines. As outlined in our conceptual framework, when institutional trust is fragile and the separating equilibrium of eco-signals breaks down (RP1), participants appear to rely on localized credibility cues when formal sustainability signals are ambiguous, weakly verified, or not trusted by institutions (RP2). By identifying two empirically observed pathways of heuristic substitution in this specific cross-cultural setting, the study contributes to a more process-oriented understanding of how consumers interpret green claims when formal sustainability signals are perceived as degraded or ambiguous (Montero-Navarro et al., 2021; Nugraha et al., 2024; Castro Santa & Drews, 2023; Torres-Peña et al., 2026). For the Romanian-speaking analytical segment, Romanian-speaking participants more often described information-oriented forms of evaluation, in which transparency, label clarity, and product-level details appeared to function as important credibility cues. These findings corroborate prior research on the mediating roles of informational transparency and green trust in food contexts (de Sio et al., 2022; Nygaard & Silkoset, 2023). Additionally, this pattern broadens the scope of quantitative research on label-driven decision-making in developing EU markets, where consumers view sustainability indicators as credence attributes that necessitate direct verification (Boncinelli et al., 2023; Borda et al., 2021; Dan & Jitea, 2024). On the other hand, Hungarian-speaking participants more often described experiential and source-based cues, such as prior experience, familiarity with the producer, and perceived authenticity, as central to credibility assessment. This experiential heuristic system resembles locally embedded trust structures documented in Romanian and Central and Eastern European (CEE) organic food studies (Petcu & Nicolau, 2025; Chiciudean et al., 2019). These findings challenge overly uniform accounts of green-claim processing. They suggest that, in high-noise environments, credibility may not be restored simply by providing more information. Rather, signals must align with the credibility cues that consumers deem meaningful in their local purchasing contexts.

5.2. Cultural Embeddedness of Attitude–Behavior Tensions

Although previous studies have thoroughly documented the attitude–behavior gap in sustainable consumption (ElHaffar et al., 2020; Szabo & Webster, 2021; Pizzetti et al., 2021), our results do not directly examine this gap as a behavioral outcome. Instead, our results offer an interpretive account of how participants articulated tensions between sustainability-related concerns and everyday purchasing practices. This pattern resonates with broader discussions of the attitude–intention–behavior gap in sustainable consumption (ElHaffar et al., 2020; Szabo & Webster, 2021; Araújo et al., 2025). The reflexive processes observed in the Hungarian-speaking sample align with comparative evidence from Central and Eastern Europe showing that consumers process environmental information differently depending on their culture (Hajdú et al., 2018; Bădescu et al., 2025). These pathways are consistent with the expectation that interpretive orientation varies across linguistic groups, supporting the theoretical distinctions outlined in RP1 and RP3. While baseline skepticism triggered by signal degradation (RP1) is present in both groups, the interpretive patterns through which it is constructed diverge fundamentally along culturally embedded lines (RP3). These findings extend earlier observations on culturally differentiated information-processing logics in green consumption (Nygaard & Silkoset, 2023; de Sio et al., 2022).

In the Romanian-speaking group, skepticism and evaluation are closely linked to routine shopping behavior. This makes these consumers highly sensitive to greenwashing at the point of sale, which mirrors the effects of greenwashing on point-of-purchase choices documented in experimental food studies (Boncinelli et al., 2023). In contrast, the Hungarian-speaking group indicates that generalized skepticism can be structurally decoupled from immediate purchasing decisions (Foreh & Grier, 2003; Ellen et al., 2006). This loose coupling enables consumers to adopt a critical stance toward market practices while maintaining their daily consumption routines. Thus, the study suggests that linguistic and sociocultural contexts may influence not only what participants say about green claims but also how they evaluate the relevance of these claims in everyday purchasing situations.

5.3. Sociodemographic Structuring of Skepticism

Beyond overarching cultural patterns, our findings reveal that demographic variables also influence how greenwashing is perceived. These results add a crucial sociodemographic layer to the culturally embedded interpretive pathways discussed in RP3. The observed patterns expand on comparative evidence from Central and Eastern Europe regarding demographic moderators of green claim evaluation (Hajdú et al., 2018; Balaskas et al., 2025) and are consistent with recent findings regarding age- and gender-specific responses to Environmental, Social, and Governance (ESG)-labeled food advertising (Balaskas et al., 2025). While these patterns should be interpreted cautiously, they align with prior evidence suggesting that green claim evaluation, food label interpretation, and trust in sustainability-related information may vary by demographic and regional context (Hajdú et al., 2018; Borda et al., 2021; Dan & Jitea, 2024; Bădescu et al., 2025; Balaskas et al., 2025).

5.4. Theoretical Implications

This study has three theoretical implications for research on greenwashing, signaling theory, and sustainable consumption. First, the findings suggest that the perceived credibility of sustainability signals cannot be understood solely through the formal presence of labels, certifications, or environmental claims. In this study, participants interpreted such signals based on locally meaningful credibility cues. This indicates that signal costliness and signal fit may be perceived differently across linguistic and sociocultural contexts (Spence, 1973; Delmas & Burbano, 2011; Grunert et al., 2014; Seele & Gatti, 2017; White et al., 2019; Lyon & Montgomery, 2015).

Second, the study provides interpretive support for heuristic substitution as a possible receiver-side pathway through which consumers make sense of ambiguous or degraded sustainability signals. Rather than treating heuristic substitution as a universal cognitive mechanism, the findings suggest that participants sometimes replaced distrusted formal signals with alternative cues such as transparency, ingredient clarity, producer familiarity, prior experience, perceived quality, and local authenticity (Tversky & Kahneman, 1974; Chaiken, 1980; Foreh & Grier, 2003; Ellen et al., 2006; Castro Santa & Drews, 2023; Torres-Peña et al., 2026).

Third, the findings contribute to an understanding of perceived greenwashing that is embedded in culture. Romanian- and Hungarian-speaking participants did not evaluate green claims through identical interpretive orientations (Hajdú et al., 2018; Chiciudean et al., 2019; Borda et al., 2021; Dan & Jitea, 2024; Bădescu et al., 2025; Petcu & Nicolau, 2025). Romanian-speaking participants more often articulated an information-oriented pathway, while Hungarian-speaking participants more often relied on experiential validation and reflexive skepticism. These differences should be interpreted as context-specific patterns observed in this sample rather than fixed characteristics of linguistic or ethnic groups.

Together, these findings contribute to a process-oriented interpretation of perceived greenwashing, showing how participants described the fit, ambiguity, and credibility of sustainability signals under conditions of uncertainty. This complements outcome-oriented models of perceived greenwashing while remaining within the analytical limits of a qualitative, interpretive research design.

5.5. Managerial and Policy Implications

The findings call into question the effectiveness of a one-size-fits-all approach to sustainability communication, especially in multicultural or evolving markets. This is particularly important in contexts where consumers do not automatically consider formal sustainability claims to be credible. In these contexts, trust depends on transparency, source credibility, and perceived authenticity rather than label presence alone (Grunert et al., 2014; Borda et al., 2021; Montero-Navarro et al., 2021; Dan & Jitea, 2024). For brands, especially small and medium-sized enterprises (SMEs) facing emerging environmental, social, and governance (ESG) compliance pressures, the findings imply that standard EU-level eco-labels or generic green claims might not be enough to earn the trust of all consumers (Kubalek & Kudej, 2025). Recent evidence indicates that building organizational resistance to greenwashing requires more than compliance-oriented communication; it also necessitates authentic ESG practices, transparent information, and consistency between claims and performance (Bernini et al., 2024; Yang et al., 2020).

For consumers who rely more on experiential or source-based credibility cues, adding technical information to packaging may be insufficient. In such cases, building credibility may depend more on consistent product quality, producer familiarity, localized narratives, and experientially validated authenticity (Petcu & Nicolau, 2025; Poulis et al., 2026; Wu et al., 2020). This does not imply that formal labels or technical information are irrelevant; rather, their credibility depends on whether consumers perceive them as meaningful, interpretable, and connected to trusted sources.

From an administrative science perspective, the findings suggest a potential boundary condition for regulatory communication: standardized governance tools, such as uniform eco-labels, may be less effective when not perceived as meaningful, trustworthy, or interpretable within local consumer contexts. Rather than providing evidence on the effectiveness of particular interventions, the study indicates that future policy design should consider not only stricter labeling rules but also broader trust conditions under which consumers interpret formal sustainability signals. This interpretation aligns with research indicating that anti-greenwashing efforts require clearer rules, stronger oversight, consumer-facing transparency mechanisms, and clearer communication about the meaning, verification, and credibility of sustainability claims (Bernini & La Rosa, 2024; Nugraha et al., 2024; Cherono et al., 2025; Sciortino et al., 2025).

6. Conclusions

6.1. Main Conclusions

This study provides interpretive support for a conceptual framework that suggests that green claim evaluation is a context-dependent, multi-stage process, rather than a uniform, or purely information-driven response. When the perceived credibility of standardized eco-signals weakened, participants in this study did not simply reject green claims. Rather, they articulated interpretive heuristics through which they assessed credibility under uncertainty. By identifying distinct heuristic substitution pathways, this research shifts the understanding of greenwashing from being viewed merely as an objective property of corporate communication to a subjective failure of signal fit. The findings suggest that, although a baseline skepticism triggered by signal degradation is universal, the mechanisms

through which this skepticism is constructed diverge fundamentally along culturally embedded lines. For the analytical, Romanian-speaking group, signal degradation is countered by heightened informational scrutiny, where transparency itself functions as a substitute signal. Conversely, the reflexive Hungarian-speaking group frequently discounts formal communication in favor of experiential and product-based authenticity.

Furthermore, this research contributes to discussions of the attitude–behavior gap. It shows how, in this setting, participants articulated tensions between their concern for sustainability and their everyday purchasing routines. In contrast, the reflexive pathway structurally decouples generalized skepticism from immediate purchasing decisions, enabling consumers to maintain a critical stance without constantly disrupting their daily consumption routines.

Ultimately, this study expands the field of credence goods economics by showing that signal credibility is not universally perceived. In markets where institutional trust is low, consumers substitute formal eco-signals with culturally resonant cues. This suggests that skepticism may not operate as a uniform construct across contexts but rather as a culturally differentiated construct that interacts uniquely with reported purchase-related reasoning. Therefore, the findings suggest that standardized governance tools and generic sustainability communications may be less effective when not aligned with localized trust structures and interpretive heuristics.

6.2. Limitations and Future Research

Several limitations should be acknowledged. First, the study is based on qualitative focus group data from a specific regional and sociocultural context. Additionally, the comparison between the Hungarian- and Romanian-speaking subsamples is based on an unequal number of focus groups, so caution should be exercised when interpreting comparative patterns. Therefore, the findings should not be interpreted as statistically significant differences between linguistic groups but rather as analytically transferable insights into how participants in two linguistic subcontexts articulated the credibility of sustainability claims. Future research could examine whether the proposed interpretive pathways appear in other cultural, linguistic, and regulatory environments using larger, more balanced samples.

Second, computational text analysis was used to support and deepen the qualitative interpretation; however, it should not be understood as independent confirmatory evidence. LDA and sentiment analyses were used as complementary analytical tools to structure and triangulate the interpretation rather than as substitutes for qualitative analysis or as validation of the findings in and of themselves. Future studies could combine qualitative, survey-based, experimental, or observational approaches to examine the robustness and behavioral relevance of the identified patterns.

Third, the findings reflect self-reported focus group accounts rather than observed purchasing behavior. Consequently, the study does not directly examine actual purchasing decisions or the attitude–behavior gap as a behavioral outcome. Rather, it identifies how participants articulated interpretive tensions between sustainability-related concerns and everyday purchasing routines. Future studies could examine whether these reported tensions correspond to actual behavioral patterns using observational, experimental, or longitudinal research designs.

Fourth, the study primarily focuses on food-related sustainability claims. Since the credibility of green claims may vary across product categories, future research could extend the analysis to other domains, such as apparel, household products, cosmetics, or services.

Finally, the conceptual framework developed in this study is not intended as a causal model. It identifies interpretive pathways through which participants made sense of sus-

tainability claims but does not test causal relationships between greenwashing perceptions, trust, and purchasing behavior. Future research could test these relationships using larger samples and complementary quantitative designs.

Sixth, the sample consisted of active consumers rather than non-buyers or those who had completely stopped buying green products. Therefore, the study could not directly assess market exit, category abandonment, or non-purchase behavior. Future research should examine these outcomes using samples that include non-buyers, avoiders, and consumers who have consciously disengaged from green-labeled products.

Finally, the study did not test any specific policy or managerial intervention. Therefore, the implications should be considered exploratory rather than evidence of intervention effectiveness. Future research could directly test how different labeling formats, transparency mechanisms, consumer education tools, and certification systems influence trust and green claim evaluation.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding authors.

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Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

Abbreviation	Full Form
AI	Artificial Intelligence
CEE	Central and Eastern European
ESG	Environmental, Social, and Governance
EU	European Union
FGI	Focus Group Interview
GDPR	General Data Protection Regulation
LDA	Latent Dirichlet Allocation
NLP	Natural Language Processing
PGW	Perceived Greenwashing

POS	Part-of-Speech (in “POS-tag”)
RP	Research Proposition (RP1, RP2, RP3)
SME	Small and Medium-sized Enterprise

Appendix A

Table A1. Demographic Profile of the Sample.

Category	Subcategory	Total Sample, n (%) N = 40	Hungarian Sample, n (%) N = 26	Romanian Sample, n (%) N = 14
Gender	Male	20 (50.0%)	13 (50.0%)	7 (50.0%)
	Female	20 (50.0%)	13 (50.0%)	7 (50.0%)
Age group	18–34 years	14 (35.0%)	7 (26.9%)	7 (50.0%)
	35+ years	26 (65.0%)	19 (73.1%)	7 (50.0%)
Residence	Urban/city	21 (52.5%)	13 (50.0%)	8 (57.1%)
	Rural	19 (47.5%)	13 (50.0%)	6 (42.9%)

Appendix B

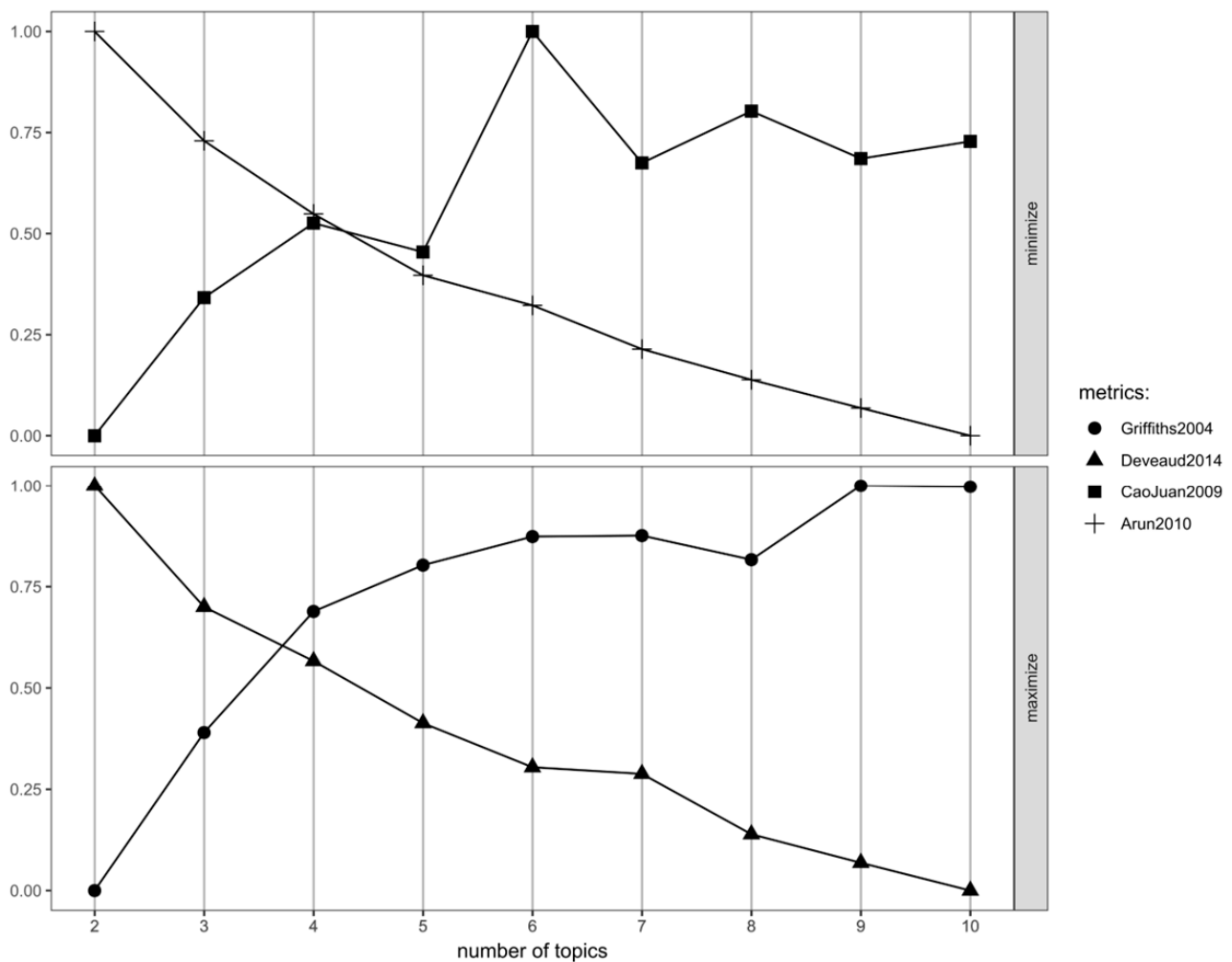


Figure A1. LDA model tuning and optimization for the Hungarian sample using four topic-number selection metrics (Griffiths & Steyvers, 2004; Cao et al., 2009; Arun et al., 2010; Deveaud et al., 2014).

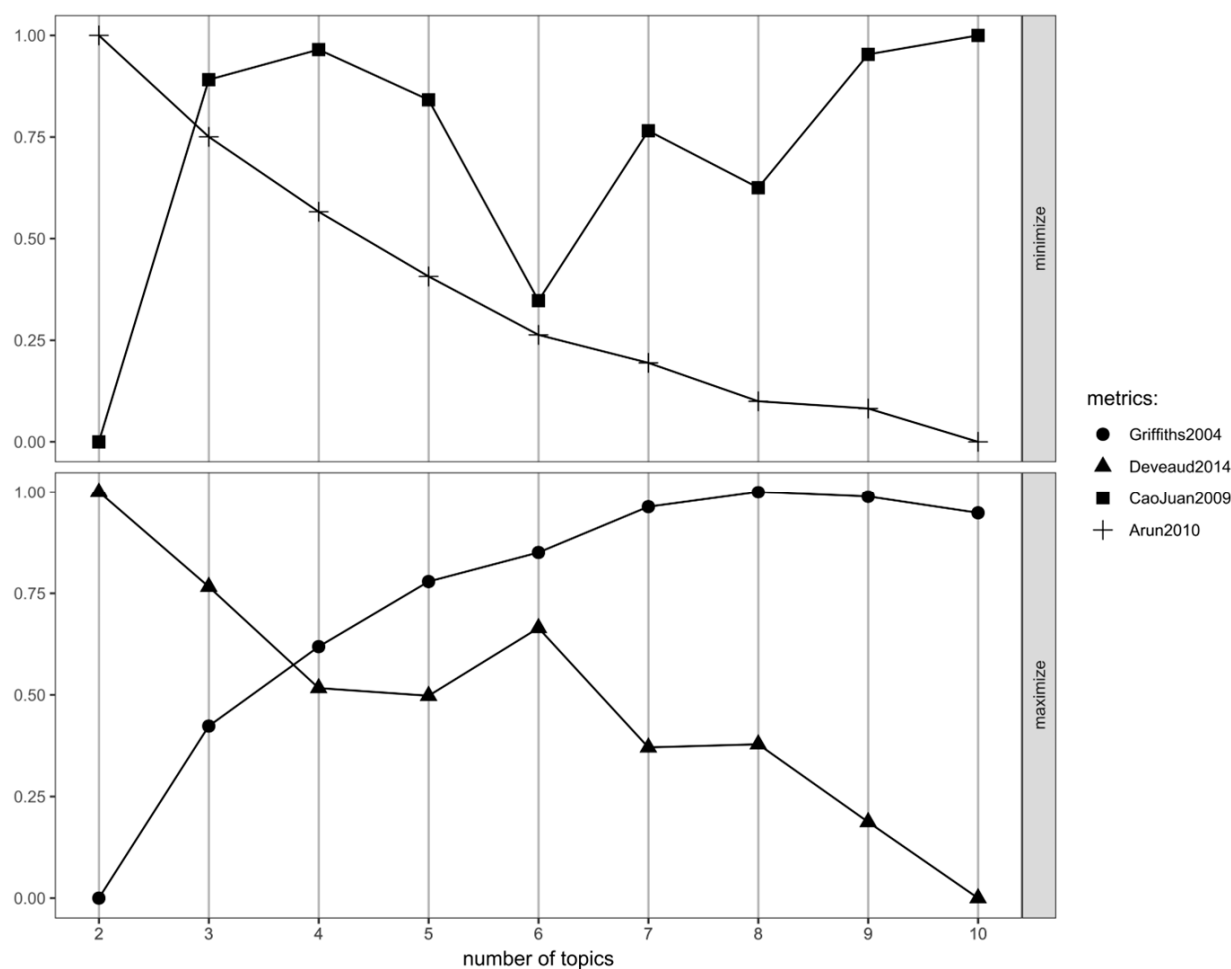


Figure A2. LDA model tuning and optimization for the Romanian sample using four topic-number selection metrics (Griffiths & Steyvers, 2004; Cao et al., 2009; Arun et al., 2010; Deveaud et al., 2014).

Appendix C

Thematic Block	Purpose	Example Prompts/Tasks
Opening and participant introduction	To build rapport and contextualize participants' everyday consumption background	Participants briefly introduced their age, place of residence, occupation, and relevant personal background.
Word association task	To elicit spontaneous associations with sustainability-related concepts	Participants were asked to name the first three words that came to mind for terms such as purchasing, organic, knowledge, food product, green product, brand, and sustainable.
Food purchasing habits	To map everyday food-shopping routines and decision criteria	Participants discussed how often they buy food, where they shop, who shops in the household, and what criteria they use when choosing food products.
Food purchasing ranking task	To compare the perceived importance of specific food-choice criteria	Participants jointly ranked criteria such as price, brand, healthiness, manufacturer, domestic origin, quality, organic certification, previous positive experience, nutritional composition, labels, and environmentally conscious packaging.

Thematic Block	Purpose	Example Prompts/Tasks
Environmentally conscious purchasing	To explore how environmental consciousness appears in everyday purchasing practices	Participants discussed how they define environmental consciousness, how it appears in food purchases, and what advantages or disadvantages they associate with such products.
Greenwashing associations and examples	To examine familiarity with greenwashing and interpretations of misleading green claims	Participants provided associations with greenwashing-related terms, discussed the definition of greenwashing, and reflected on examples and visual cases.
Scenario-based purchasing motivations	To examine how sustainability considerations enter concrete product choices	Participants discussed decision criteria for buying jeans and eggs, including environmental, ethical, health-related, and greenwashing-related concerns.
Future challenges and closing reflection	To capture perceived relevance of anti-greenwashing measures and possible lifestyle or policy changes	Participants reflected on the importance of combating greenwashing, desired changes, and future challenges.

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