IGNORANCE IS BLISS: UNDERSTANDING HOW THE NUMBER OF ECO-LABELS AFFECTS HIGH VS. LOW-KNOWLEDGE CONSUMERS

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SUMMARY: Brands use eco-labels to demonstrate product specifications and business practices to consumers and communicate their commitment to the environment. The authors explore how high-knowledge vs. low-knowledge consumers respond to eco-labels on packaging (specifically, one vs. three eco-labels). The results of an experimental study show that low-knowledge consumers find one eco-label on packaging more credible compared to high-knowledge consumers. However, for low-knowledge consumers, the credibility of the product claims decreases significantly once they are presented with three eco-labels on the product package. The implications of this research are twofold. First, product and brand managers should prioritize quality over quantity when choosing eco-labels to place on product packaging. Second, managers and policy makers should aim to educate uninformed consumers about eco-labels' meanings to avoid consumer misinformation and to encourage consumers to support businesses that embrace environmentally friendly practices.

Keywords: eco-labels, green marketing, packaging, consumer behavior, sustainability, sustainability marketing

INTRODUCTION

The push towards consuming products that do not harm self, society, or the environment has been booming in the last decade (Prakash et al., 2019). According to NielsenIQ's (2019) report on sustainability, 73 percent of global consumers state that they would change their consumer behavior to reduce their negative impact on the environment. Furthermore, consumers are interested in buying products that simultaneously help the environment. In fact, 41 percent of consumers globally say they are willing to pay more for products containing natural ingredients (NielsenIQ, 2019). To shed light on the financial magnitude of this trend, total organic product sales have been exponentially increasing in the last ten years and have hit $63 billion in the United States alone as of 2021 (Organic Trade Association, 2023).

This changing demand for eco-friendly products and services has led to new avenues for firms to distinguish themselves and their products in the market (Leonidou et al., 2013). Adopting eco-friendly product lines and labeling allows firms to differentiate themselves from their competitors. For example, many retailers now offer products made from environmentally friendly materials, such as organic cotton, recycled plastics, and biodegradable packaging. This global shift towards sustainable products is evidenced by big box retailers' increasing interest in creating their own eco-friendly and natural product lines. Walmart's sustainable Great Value product line and Target's pledge to have their own brands be sustainable by 2025 are among such examples.

The shift towards environmentally friendly (or at least non-harmful) consumption has irrefutably led to the creation of tools that communicate an environmental commitment to the consumer. Eco-labels are one end-product of this need. The U.S. Environmental Protection Agency defines eco-labels as "marks placed on product packaging or in e-catalogs that can help consumers and institutional purchasers quickly and easily identify those products that meet specific environmental performance criteria and are therefore deemed environmentally preferable" (U.S. Environmental Protection Agency, 2023). Eco-labels are owned or managed by government agencies, nonprofit environmental advocacy organizations, or private sector entities. Products marketed as better for the environment are often accompanied by eco-labels and/or sustainability certifications. There are almost 460 eco-labels globally (Ecolabel Index, 2023). Over 35% of these eco-labels have been created in the last decade, and over 120 different types are commonly used on food and drink products (Ecolabel Index, 2023).

An increasing number of studies in the field of marketing are exploring how eco-labels affect consumer perceptions and behavior. There is tension between the potential for eco-labels to harm or help brands. On the one hand, some studies find that eco-labels lead to informing consumers about transparent practices, helping them make informed purchase decisions and increasing awareness around environmental issues (Thøgersen, 2002; Testa et al., 2015; Tofighi & Sharpe, 2019). On the other hand, some studies recognize that the impact of eco-labels on consumer perceptions can be limited, particularly if the labels are not well-known or trusted or if they are perceived as confusing or misleading (Taufique et al., 2014; Testa et al., 2015; Meis-Harris et al., 2021). Additionally, Meis-Harris et al. (2021) observe that the influence of eco-labels can be limited by other product characteristics such as product price, availability of alternative products, and consumers' perceived sacrifice involved in making an environmentally friendly choice.

Having seen a boost in sales due to the use of eco-labels and environmental claims, businesses have started to exaggerate their use of green messaging. Also known as "greenwashing," businesses disseminate false or deceptive information regarding their environmental strategies, goals, motivations, and actions to promote themselves as sustainable and environmentally conscious in the hopes of higher sales volumes (Becker-Olsen & Potucek, 2013). In parallel, the extent of eco-label use has increased in recent years. This trend has resulted in many products claiming to meet specific environmental performance criteria, printing two or more eco-labels on the packaging. However, the effectiveness of using multiple eco-labels on packaging remains unexplored in the literature. Multiple eco-labels may lead to better consumer perceptions and higher sales or make consumers suspicious of exaggerated business claims. In this study, we explore the impact of using multiple eco-labels on consumer perceptions through an experiment to understand their effectiveness.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Information Asymmetry in Markets and Signaling Sustainability

An increasing number of consumers are striving to purchase products and services that are ecologically responsible and ethically sound (NielsenIQ, 2019). However, understanding whether a business is genuinely ecologically responsible or ethical in all steps of its supply, production, and sales processes requires a lengthy and cumbersome information search by the consumer. Signaling theory postulates that a disparity of information exists in the market, whereby buyers know fewer details about firms' operations than firms themselves (Connelly et al., 2011). This information asymmetry between buyer and seller can create an environment where it is difficult for buyers to make informed decisions (Akerlof, 1970; Jahn et al., 2005). In the marketplace, where there is information asymmetry, consumers must rely on brand signals, such as labels, certifications, and marketing claims, to learn about business practices implemented by the firm. For this purpose, businesses employ various means to signal to customers the characteristics of their commodities and portray a distinct modus operandi. Consumers need to recognize and leverage different cues from the brand to judge a product's quality and characteristics (Akdeniz et al., 2013; Atkinson & Rosenthal, 2014). For example, product warranties, packaging features, and even brand partners can work to indicate quality, environmental friendliness, social standing, and healthiness to customers (Cason & Gangadharan, 2002; Erdem & Swait, 1998; Ford et al., 1990; Kirmani & Akshay, 2000; Nelson 1970, 1974; Rao et al., 1999; Atkinson & Rosenthal, 2014).

Following this logic, eco-labels are powerful communication tools for brands to signal their sustainable and ecologically sound business practices to potential buyers. Eco-labels are easy-to-obtain, marketer-controlled, extrinsic informational cues that consumers use to infer the ecological standing of a product. They engage buyers cognitively and emotionally and inform them whether they will achieve their environmental goals by purchasing certain products (Bagozzi & Dholakia, 1999; Bloom & Reve, 1990; Thøgersen, 2000). In this context, eco-labels on product packaging serve as a visual cue for consumers to make informed purchase decisions and accomplish their ethical and sustainable consumption choices (Rex & Baumann, 2007; Bleda & Valente, 2009).

Elaboration Likelihood Model and Stimuli Processing

The Elaboration Likelihood Model (ELM) of Petty and Cacioppo (1981) postulates a duality in the processing of any informational stimulus: 1) the central route and 2) the peripheral route. The central route to persuasion requires the person to think elaborately about the presented stimuli. It is conscious, deliberate, and requires high levels of cognitive energy. For the central route to activate, a consumer needs the ability and the motivation to engage with the stimulus more thoroughly. On the other hand, the peripheral route to persuasion prevails when the person is not motivated to scrutinize a persuasive argument and is swayed by surface characteristics that are peripheral to a message. Peripheral cues, or superficial surface characteristics, enable the use of mental shortcuts to persuasion. As such, these external signals can act as persuasive elements when individuals are not able and/or motivated to devote mental resources to digesting information. Where the motivation or the ability to actively think about a stimulus is absent, consumers will draw upon peripherally located cues to make determinations. Research has also uncovered that peripheral cues do not have to be logically connected to the stimulus or the persuasion outcomes.

Indeed, there is evidence that source attractiveness (e.g., spokesperson attractiveness), source reliability (e.g., a spokesperson wearing a white lab coat), message length, and the number of arguments all can lead to persuasion via the peripheral route (Petty & Cacioppo, 1981; Petty and& Briñol, 2004).

Eco-labels may be processed via the central or peripheral route to persuasion depending on the ability and motivation level of the viewer. Consumers with limited knowledge regarding the meaning of an eco-label lack the ability to process the cue via elaborate thinking. Hence, there is a higher likelihood that they will process an eco-label via the peripheral route. This implies inadequate knowledge of eco-labels habituates reliance on external signals (Eberhart & Naderer, 2017). Low-knowledge consumers then conclude that the product with an eco-label is superior to a product without the label. In this manner, peripheral cues serve as persuasive stimuli for those utilizing eco-labels for mental shortcuts, further affecting pro-environmental consumption decisions. On the other hand, consumers with high knowledge regarding the meaning of an eco-label can process the argument elaborately. Therefore, they are more likely to process an eco-label via the central route and think about the logic behind the message.

Modeling Environmental Goals

Thøgersen (2000) claims that pro-environmental motivation, perceived consumer effectiveness of eco-friendly behavior, belief in no-harm buying practices, and levels of trust in labels shape consumers' environmental goals (Bagozzi & Dholakia, 1999; Thøgersen, 2000). Based on his work on goal theory, he proposes that consumers will only pay attention to eco-labels if they prioritize the "no-harm" goal. Shoppers rely on eco-labels as shortcuts for making decisions, and a consumer's comprehension of an eco-label is a fundamental factor in whether they will take note of the label and whether it will affect their buying decisions (Thøgersen, 2000).

In the field of sustainable consumption, several studies have explored the credibility and efficacy of eco-labels. A growing number of researchers have looked at the effects of consumer product involvement (Atkinson & Rosenthal, 2014), different label sources (Beltramini & Stafford, 1993; Castka & Corbett, 2016; Ozanne & Vlosky, 1997; Sheffet, 1983; Atkinson & Rosenthal, 2014), label age and label longevity (Beltramini & Stafford, 1993), and argument specificity (Atkinson & Rosenthal, 2014) on label credibility. Ozanne and Volasky (1997) find that consumers are more likely to believe the label's claims if it comes from a government source. Atkinson and Rosenthal (2014) argue that consumers are more likely to treat an eco-label as a peripheral cue when engaging with low-involvement products than when facing high-involvement products. Atkinson and Rosenthal (2014) also look at the effects of source effectiveness and find evidence that different source types are more effective for high-involvement vs. low-involvement products. Teisl et al. (2002) find that labels that include only a simple graphic image are seen as insincere marketing instruments compared to visually more complicated labels. Atkinson and Rosenthal's (2014) work advocates that those arguments with more specificity lead to more positive attitudes toward the labeled product and a higher likelihood of purchase (e.g., all-natural is broader than sulfate-free), and they also find that completely fake labels lead to similar consumer perceptions as do real labels.

This study adds to the literature by measuring the effect of multiple eco-labels on product packaging. The messaging tools for communicating environmental aid increase with the growth of environmental problems, and we believe that measuring the impact of green (over)signaling would benefit brand managers and brand theorists. The number of eco-labels on packaging has

increased in recent years because firms have seen better sales and positive consumer perceptions of greener products. For example, in a consumer study conducted in a centrally located grocery store in a large midwestern city by Yoruk, out of 100 randomly selected products, 32% had zero or one label, and 68% carried two or more labels (Yoruk, 2022). Our study challenges the expectation that more eco-labels on packaging is better, as we find that the higher number of eco-labels placed on a product causes a decrease in the credibility of the product's claims.

Hypothesis Development

ELM proposes that consumers may process an eco-label that signals environmental friendliness via the central route or the peripheral route to persuasion. Consumers lacking sufficient information about eco-labels are more susceptible to heuristics and rely on visual or verbal cues instead of considering a product's actual environmental value (Eberhart & Naderer, 2017). When one eco-label is present on packaging, consumers with low knowledge of ecological labels will treat the eco-label as a mental shortcut, resulting in them having higher credibility of the product's claims. Hence, low-knowledge consumers will demonstrate greater trust in the merchandise that displays an eco-label.

Conversely, when consumers have higher knowledge of ecological labels, the likelihood of them engaging in elaborate thinking about the stimulus and processing the stimulus cognitively increases (Petty et al., 2004). Thøgersen (2000) proposes that those with greater knowledge and understanding of ecological labels will likely process eco-labels cognitively and question a label's authenticity and credibility. When one eco-label is present on the packaging, high-knowledge consumers will find the product's claims less credible.

Furthermore, this pattern may not hold true when the number of labels shown on packaging increases. When multiple environmental labels exist on a package, consumers are expected to perceive the increasing number of environmental claims on packaging as an exaggeration rather than a sincere communication of product specifications. Therefore, we propose that the credibility of a product's claims will deteriorate as the number of eco-labels on packaging increases. Consumers with high knowledge of eco-labels will not change their information processing route to persuasion when faced with multiple eco-labels; they will still process the information using the central route. This will result in high-knowledge consumers having lower credibility of the product's claims both for one eco-label and multiple eco-label scenarios.

Nevertheless, consumers with low levels of information about environmental labels will process multiple eco-labels on packaging centrally and question the credibility of the product's claims when multiple environmental cues coexist on one package. In short, the low-knowledge consumers will evaluate three labels as "too good to be true," even though they find one eco-label as a credible claim. Hence, we propose that the high-knowledge consumers will process both stimuli centrally, resulting in low credibility of the product's claims across one eco-label and multiple eco-label conditions. Furthermore, we propose that the low-knowledge consumers will process one eco-label peripherally, resulting in high credibility of the product's claims, but process three eco-labels centrally, resulting in low credibility of the product's claims.

Hypothesis 1: The knowledge level of consumers will moderate the effect of the number of eco-labels on packaging on consumers' judgment of the credibility of the product's claims.

For high-knowledge consumers, the existence of one eco-label and three eco-labels will both lead to low levels of credibility of the product's claims. For low-knowledge

consumers, one eco-label will increase the credibility of the product's claims. In contrast, the existence of three eco-labels will lead to lower credibility of the product's claims.

We propose the model in Figure 1 to better explain consumer behavior for ethical and no-harm consumption. Building on Thøgersen's model for "predicting paying attention to eco-labels and the purchase of labeled products," we suggest that the number of eco-labels impacts how consumers process the information, and the knowledge of labels acts as a moderator in this relationship.

Figure 1. Proposed Model: Processing Eco-Labels

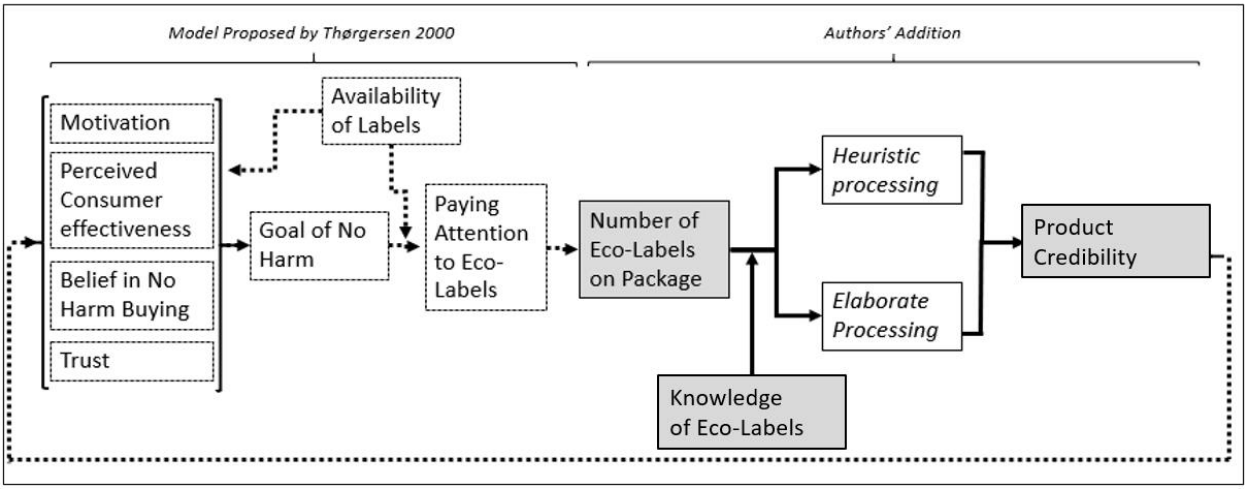


Figure 2. Experimental Stimuli

1 Eco-Label Present	3 Eco-Labels Present
	

METHODOLOGY

We use a 2 (Knowledge level: high/low) x 2 (1 seal for Fair-Trade, 3 seals for Fair Trade, Rainforest Alliance, and Certified Vegan) between-subjects design, with random assignment across conditions. Data is collected online from MTurk.

Participants were randomly assigned to view a package of loose-leaf tea with a fictitious brand either with one eco-label (Fair-Trade label by the Fair-Trade Association) or three eco-labels (Fair-Trade, Rainforest Alliance, and Certified Vegan), images shown in Figure 2. Then, they evaluated the credibility of the product's claims. Lastly, participants answered several questions that measured their knowledge of the eco-labels presented on packaging.

The credibility of the product's claims was measured using items adapted from Erdem and Swait's (1998) brand credibility scale. It was calculated by averaging the answers to three items from the brand trustworthiness dimension of the brand credibility scale. ("I think this is a product you can trust," "This product is likely to deliver what it promises," "This product's claims are credible to me."). The answers to these items were measured on a 7-point scale.

Tea was chosen for the tests because consumer packaged goods (CPGs) are shown to be goods for which consumers evaluate alternative brands. Pre-test results indicate that consumers are sensitive to product quality and eco-labels when considering purchasing tea. Furthermore, eco-labels are most used in the coffee and tea product category (NielsenIQ, 2019). The International Fair Trade Certification label was chosen because it is both easy to understand, old enough to be publicly known and remains largely uncontroversial. The International Fair Trade Certification label has been effective since 2002. There is occasionally some conflict about this label concerning its effectiveness and affordability (Subramanian, 2019). However, our pre-tests concluded that only high-knowledge consumer groups were aware of and concerned about the economic means necessary to afford a Fair-Trade label as a firm. "Rainforest Alliance Certified" and "Certified Vegan" labels are chosen for two reasons: 1) they very commonly appear on products today, and 2) these two eco-labels and the Fair-Trade seal can coexist on a technical level, meaning any given business can produce vegan products, conduct fair-trade operations, and do no harm to rainforests.

RESULTS

One hundred sixty-nine responses were collected at the end of the survey. One hundred fifty-nine participants provided accurate responses to the manipulation check questions, indicating that they had paid close attention to the stimuli presented. However, ten participants were excluded from the analysis as they provided incorrect answers to the manipulation checks. The final data set included one hundred fifty-nine participants participants across four conditions.

To interpret the effects of the number of eco-labels and the levels of consumer knowledge on the credibility of the product's claims, a 2 X 2 between-subjects ANOVA is conducted. Table 1, Figure 3, and Figure 4 summarize the means and standard deviations of the dependent variable across different groups of consumers' knowledge levels and groups that were exposed to different numbers of labels on the package. Results support the first hypothesis. The two-way interaction between consumers' knowledge levels and the number of labels on the package is significant, $F(1,150) = 3.94$, $p < .05$. To better understand this interaction, we further conducted mean

comparison tests. Mean comparisons reveal that low-knowledge consumers report greater credibility of the product's claims for the product with one eco-label (M = 3.04, SD = .90) compared to the product with three eco-labels (M = 2.54, SD = 0.78), $F(1,84) = 7.40$, $p < .01$). Still, high-knowledge consumers report no significantly different credibility of the product's claims for the product with one eco-label (M = 2.20, SD = 0.83) compared to the product with three eco-labels (M = 2.27, SD = 0.99), $F(1, 68) = .09$, $p = .77$). Additionally, mean comparison tests for the overall credibility results for the product with one label revealed that high-knowledge consumers report lower credibility of the product's claims (M = 2.20, SD = 0.83) than low-knowledge consumers overall (M = 3.04, SD = .90), $F(1,68) = 15.83$, $p < .01$). This suggests that high-knowledge consumers process stimuli centrally and think elaborately when faced with eco-labels on packaging for both one eco-label and three eco-label scenarios. They report low credibility of the product's claims when they see one eco-label and three eco-labels. On the other hand, low-knowledge consumers process one eco-label on packaging peripherally. The Fair-Trade label seems to be acting as a successful cue for the credibility of the product's claims for low-knowledge consumers when presented alone. However, low-knowledge consumers process stimuli centrally and think elaborately when faced with three eco-labels on packaging, and they report low credibility of the product's claims.

Table 1. Study Results

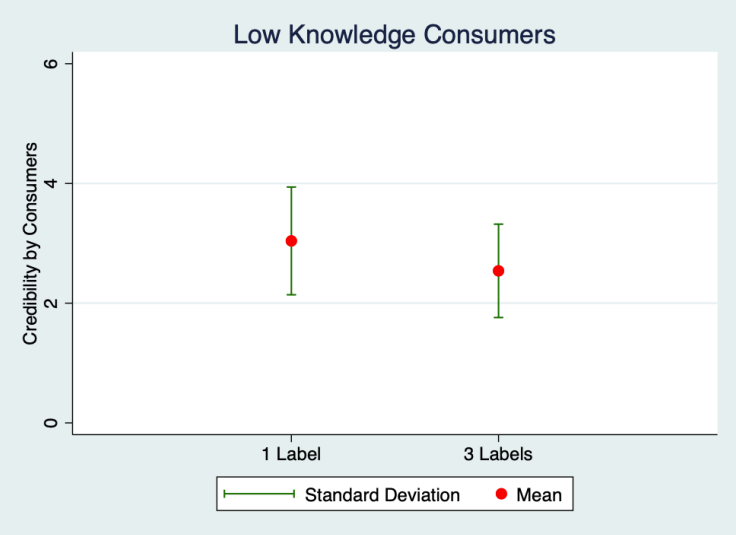
Summary of Group Statistics

		Mean	*SD*
Low-Knowledge Consumers	1 eco-label condition	3.04	0.90
	3 eco-labels condition	2.54	0.78
High-Knowledge Consumers	1 eco-label condition	2.20	0.83
	3 eco-labels condition	2.27	0.99

Figure 3.The Effect of Multiple Labels on Packaging on High-Knowledge Consumers



Figure 4. The Effect of Multiple Labels on Packaging on Low-Knowledge Consumers



DISCUSSION AND IMPLICATIONS FOR PRACTICE

In sum, our study provides evidence and support for our hypothesis. Our results show that consumers with low-knowledge of eco-labels process one eco-label heuristically and report greater credibility of the product's claims. However, when faced with three eco-labels on the packaging, the credibility of the product's claims significantly decreases for low-knowledge consumers. Correspondingly, consumers with a high-knowledge of eco-labels process one or three eco-labels on packaging cognitively and question their presence, resulting in lower credibility of the product's claims in both cases.

This study's findings have numerous key implications for marketing managers and policy makers in the context of eco-labeling and the credibility of product claims. First, we strongly suggest that business managers be transparent in their business conduct and prioritize quality over quantity when choosing eco-labels. As our study shows, increasing the number of eco-labels on packaging hurts the credibility of the claims. Hence, choosing the minimum number of labels to appear on packaging, those with the highest importance and/or effectiveness is crucial. Brand managers should aim to use eco-labels as sincere communication tools to inform consumers about the specific environmental criteria that the product meets rather than as insincere signals of superiority or quality. Including multiple labels on packaging, even if they are consistent with each other, creates inconsistencies in the consumer's mind. The presence of multiple labels leads to the overstimulation and confusion of the consumer, resulting in the consumer thinking that the stimulus is too good to be true. This creates mistrust in the environmental shopping cues. As seen in our study, high-information consumers are always skeptical of eco-labels. Low-information consumers have significantly lower credibility of the product's claims once they observe multiple eco-labels on the packaging. Hence, carefully considering which eco-labels appear on product packages is crucial in communicating environmental commitment.

Secondly, we suggest conveying detailed information on labels instead of oversaturating the package with multiple eco-labels. The informational nature of a label, rather than the sheer

volume of cues, may lead to higher credibility of the claims among consumers (Atkinson & Rosenthal, 2014). The point of purchase is the most important place for consumers to be educated about the seals and environmental issues (Thøgersen, 2000). While low-information graphic seals can be disregarded (or not thoroughly understood) by the consumer, eco-labels supported by elaborate information can help increase the likelihood that the consumer will pay attention to the eco-label. For example, the current USDA Certified Biobased Product seal includes the percentage of biobased ingredients in the product as a part of the label. Hence, rather than signaling vague environmental claims, this label helps consumers acquire knowledge about what percentage of the product aids the environment. With copious information on a label, it is possible to further diminish information asymmetry between the consumer and the firm (especially for high-knowledge consumers) with an honest representation of the company's practices.

Thirdly, regulations surrounding how environmental labels should be placed on packages can benefit consumers' well-being. Policy makers should ensure that labels effectively convey meaningful environmental protection claims, and businesses should be held accountable for following up with their environmental claims. As seen in this study, people with low information on eco-labels are vulnerable to environmental claims placed on packaging. These consumers will not process the information conveyed by the label cognitively but instead treat these as cues for sustainability, whether the claim is honest or not. Nevertheless, the number of eco-labels that exist globally is increasing in number every day. Therefore, it is becoming impossible for consumers to learn the specifics of all eco-labels. This opens the opportunity for businesses to misuse unknown or unpopular labels on packaging. Hence policy makers need to 1) educate consumers on label specifics, 2) limit the number of labels in the marketplace, and 3) ensure businesses follow up with their environmental claims.

Furthermore, governments can initiate consumer education programs about various labels in the market and evaluate their effectiveness. For instance, there are currently 73 different eco-labels in the world that indicate a product is organic, and very few people know the difference between these various labels (Ecolabel Index, 2023). Policy makers should also regulate the number of labels on packages that can and should exist. As seen in this study, for consumers, every additional label could hinder claim credibility.

CONCLUSION AND LIMITATIONS

Although including eco-labels on packaging is generally accepted to be a good practice and leads to increased revenue for a business, not all types of inclusion lead to positive results. Our research shows that including multiple labels on packaging is a boundary condition regarding the credibility of the product's claims. Our findings suggest that the presence of multiple eco-labels results in reduced credibility compared to products with only one eco-label. This paper builds on prior research in the area of sustainability and extends the investigation of circumstances which eco-labels are shown to be fruitful tools for the consumer.

Guided by the Signaling Theory and the Elaboration Likelihood Model, we tested consumers' credibility of the product's claims across products that include one eco-label and three eco-labels. Our results indicate that including more labels does not always lead to a more positive perception of the product. These findings are compatible with our model. The model can be used as a guide to create and regulate better-serving eco-labels that generate higher credibility among

consumers. This is particularly important because once consumers lose trust in a label, it is arduous to regain that trust.

These findings correspond to managerial implications that cultivate the development and regulation of eco-labels aimed to increase the credibility of the products' claims. Businesses should stress transparency, add fewer eco-labels, and utilize labels as educational tools rather than as distracting cues. Detailed label information can boost label credibility, and label placement guidelines can help ensure that genuine environmental protection promises are successfully communicated and implemented. Furthermore, consumer education programs and labeling legislation can improve consumer well-being by minimizing confusion and boosting informed decision-making. Marketers bear the responsibility of aiding brand managers (as well as the government) in promoting the use of eco-labels as transparent and informative tools for uninformed consumers. It is essential to interfere and prevent eco-labels from becoming mere symbols that can be easily purchased without significant commitment to improved business practices.

Limitations of this study may serve as opportunities for future research. First, future research can investigate business practices that may increase the credibility of the product's claims for consumers with high-knowledge about eco-labels. Interviews with these consumers may reveal eco-labels (or other business practices) that these consumers find highly credible. This should be followed by research on the single-label vs. multiple-label uses of eco-labels with high credibility further to investigate the efficacy of multiple labels on packaging.

Second, similarities between labels in the multi-label scenario can be altered to see if similar labels (vs. different labels) lead to higher credibility. This proposal can go twofold; one option would be to have aesthetically different labels presented on packaging (i.e., different colors, different shapes), and another option would be to have labels that signal similar (vs. different) business practices (i.e., environmental product, product origin country, product warranty information, etc.). This way, we can investigate the co-existence of multiple labels where not only eco-labels are included on packaging. Such research would enable observing the interaction of eco-labels with other cues and their effect on the credibility of claims.

Third, future research can examine the use of eco-labels on different product categories and explore whether there are different consumer response patterns for different product categories when eco-labels are used. For example, using eco-labels on luxury brands may lead to different consumer responses than observed in our study. Indeed, consumer responses to eco-labels may also lead to various results tested across a wider variety of consumer goods.

In conclusion, the use of eco-labels has important implications for consumers' informed decision-making processes and businesses' environmental practices that assure the protection of the planet. Consequently, this stream of research contributes to consumer empowerment, label credibility assessment, greenwashing detection, standardization efforts, and environmental impact evaluation. Identifying the impact of eco-labels fosters information transparency, promotes sustainable business practices, and supports the informed decision-making of consumers. We hope that future research related to eco-labels addresses our potential limitations and further expands this stream of research.

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