The Signal in Consumer Decision-Making: The Role of Green Labels, Health Claims, and Brand Trust

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Driven by the "dual-carbon strategy" and healthy consumption trends, green labels and health claims have become common on product packages. However, existing researches focus only on the effects of individual labels, with limited exploration of their combined impact. Based on signaling theory, this study treats green labels as high-cost, observable signals and health claims as low-cost signals. It argues that green labels can provide credibility for health claims, thereby enhancing brand trust and increasing consumer purchase intention. A questionnaire survey was conducted using Telunsu dairy products, a premium brand under the Inner Mongolia Yili Group, as a case study. We received 153 valid answers. Results show that green labels directly enhance brand trust and indirectly promote purchase intention by making the health claim more believable. Brand trust significantly mediates the relationship between green labels and purchase intention. This study not only extends the application of signaling theory to green and health marketing but also provides practical guidance for businesses in label design and communication.

Keywords: Signaling theory; green labeling; consumer behavior; green marketing.

Abstract:

1. Introduction

As the "dual carbon strategy" and the widespread adoption of healthy consumption have become key factors, green and healthy features have become crucial points when people choose food and drinks. Companies commonly print green labels (e.g., "organic certification," "carbon neutral") and health claims (e.g., "low sugar," "high protein") on product packages to indicate their product value.

However, existing research has usually examined green labels and health claims separately, focusing only on the role of green labels in conveying environmental identity and influencing purchase intention, or on how health claims can make nutrition messages more convincing [1, 2]. Yet few studies test

what happens when both are shown together. Based on signaling theory [3], green labels can be viewed as high-cost signals requiring external certification, so they are high-cost signals that can make people see the brand as honest. Health claims, conversely, are low-cost signals with limited credibility alone. However, with the green label behind it, their credibility and influence significantly increase, thereby enhancing consumer trust in the brand and boosting purchase intention. While existing research acts as a mediation role in green marketing [4], systematic analysis of how the mix of a high-cost and a low-cost signal influences purchasing behavior through brand trust is lacking, providing the research point for this study.

Using Telunsu, a premium dairy brand under Inner Mongolia Yili Group, as a case study, this research conducted a consumer survey to examine how green labels substantiate health claims, thereby enhancing brand trust and ultimately increasing purchase intention. The study comprises four chapters: Chapter 1 introduces the research background, significance, and research questions; Chapter 2 reviews literature on green labels, health claims, and signaling theory, proposing brand trust as the mediator; Chapter 3 presents empirical analysis, detailing questionnaire design, sampling, and data collection methods, and employs SPSS and PROCESS for mediation effect testing. Chapter 4 summarizes empirical results, offering specific recommendations for corporate label design and green marketing practices, and outlining future research directions.

2. Literature Review and Research Hypotheses

2.1 Green Labels and Health Claims

Green labels (such as "carbon neutral" and "organic certification") play an important role as external information cues in modern consumer decision-making. Their main function is to show that a product has environmentally friendly attributes. These labels are usually granted by third-party certification organizations and aim to prove that a product meets certain environmental standards [5]. Green labels often involve high certification costs. For example, China's "Green Product Certification" is carried out by the China Environmental Labeling Certification Center (CEC). It covers many areas, such as household appliances, building materials, and daily consumer goods. The certification process includes strict life-cycle environmental impact assessment and production review, which require expensive testing and auditing. These high certification costs are a challenge for enterprises, but they also make green labels a costly and hard-to-fake market signal. As a result, they can effectively reduce "greenwashing" and increase consumer trust [6].

At the same time, health claims, such as "low sugar," "high protein," or "rich in vitamins," are usually made by producers themselves. Only basic nutrition tests are required [7]. Compared with green labels, the certification cost of health claims is lower because the verification process is simpler and does not involve complex environmental assessments. Health claims can sometimes help consumers recognize the health benefits of a product. Their low cost allows companies to quickly deliver health information, but the lack of third-party endorsement may reduce consumer trust, which makes them less persuasive.

Green labels and health claims serve different functions. Green labels deliver information about the environmental friendliness of a product and focus on sustainability, while health claims emphasize the health benefits of a product and focus on individual well-being [8]. However, in consumer perception, the two may complement each other. High-cost green labels can provide credibility to low-cost health claims, which improves their overall persuasiveness [9]. Although their certification costs are different, both aim to reduce information asymmetry and send signals about product quality and value to consumers. Therefore, consumers may view green labels as supporting evidence for health claims. In this way, the high value of costly certification can increase the persuasiveness of low-cost labels, making the signal more credible.

2.2 Signaling Theory

Signaling Theory was first proposed by Spence to explain the effect of educational background on job seekers' employment opportunities. The theory suggests that in situations with information asymmetry, the signal sender (such as a company) can send high-cost signals (such as high-quality certification) to show the quality of its products or services. The receiver (such as a consumer) then makes decisions based on these signals. The effectiveness of a signal depends on its cost and the difficulty of imitation. High-cost signals (such as authoritative green certifications) require strict verification procedures, which make it difficult or too expensive for low-quality companies to imitate them. This ensures the truthfulness of the signal [10]. Signaling Theory, therefore, provides a framework for understanding how external signals can reduce information asymmetry in markets. When consumers face an incomplete information environment, they often rely on signals sent by companies to make decisions.

Green labels, as a form of "high-cost signal," can reduce consumers' trust costs. They are highly credible and can effectively deliver a brand's commitment, which increases consumer trust [11]. In contrast, health claims usually function as "low-cost signals." When they appear alone, their credibility is lower, and they may not strongly influence consumer perception. Recent studies [6] show that when companies provide verifiable environmental actions

together with green claims, consumers' evaluation of the credibility, visibility, and complexity of these claims increases significantly, which improves purchase intention. In other words, when green labels and health claims are combined, the green label, as a certified high-cost signal, gives additional trust support to the health claim. This makes consumers more willing to accept the information in the health claim and increases their purchase intention.

2.3 Brand Trust: The Mediating Role

Brand trust refers to consumers' overall perception of a brand's reliability and sincerity. It is an important psychological mechanism that influences consumer purchase decisions [12]. Previous studies have shown that brand trust plays a significant mediating role in different consumption contexts. In situations of information asymmetry or high uncertainty, brand credibility can reduce consumers' perceived risk and search cost, which increases purchase intention [4]. In the field of green consumption, trust in green labels is not only a key driver for forming a green brand image and consumer satisfaction, but also strengthens overall trust in brand commitment, which has a positive effect on purchase intention [13].

The formation of brand trust is closely related to the consistency between consumer values and brand values. In other words, when consumers' environmental or health values match the ideas expressed by a brand, they are more likely to build trust in the brand and develop a more positive brand attitude [14]. This makes them more willing to make purchase decisions. Therefore, brand trust is not only a mediating variable in the influence of green labels on purchase intention, but also reflects the role of value consistency in the formation of brand trust. Empirical research [15] shows that in the context where green and health labels appear together in sustainable consumption, green labels can directly increase brand trust. At the same time, they can also indirectly increase purchase intention by strengthening consumer trust in health claims. This finding supports the idea that high-cost signals can amplify the positive effect of low-cost signals.

2.4 Theoretical Path

This study is based on signaling theory and integrates psychological mechanisms such as brand trust to explore the role of green labels and health claims in consumer decision-making. The theoretical path is as follows:

In a market environment with information asymmetry, consumers often rely on signals sent by companies to make judgments. Signaling Theory suggests that high-cost signals are more credible and convincing because they require strict certification or significant resource investment. In this study, green labels serve as high-cost signals (such as "organic certification" and "carbon neutral" labels).

Through third-party certification, they effectively communicate the authenticity of a product's environmental attributes and increase the reliability of information. In contrast, health claims usually lack external verification and function as low-cost signals, which may lead consumers to doubt their authenticity when presented alone.

The presence of green labels provides important support for health claims. Instead of simply stating that a product has health attributes, they act as verifiable high-cost signals that show the company's actual commitment to both environmental and health standards, reflecting consistent business behavior. This complementary relationship significantly increases the credibility of health claims.

Brand trust plays a key mediating role in this mechanism, including two dimensions. First, competence trust, which refers to consumers' belief that the brand has the ability and resources to fulfill its environmental and health commitments. Second, benevolence trust, which refers to consumers' perception that the brand sincerely cares about society and consumer well-being. By strengthening trust in health claims, green labels improve overall trust in the brand. When consumers' own environmental and health values are consistent with the signals delivered by the brand, they are more likely to develop emotional resonance, further consolidate brand trust, and finally transform it into purchase intention.

Therefore, this study explains the following phenomenon through signaling theory: green labels, as high-cost signals, support health claims as low-cost signals, enhance consumer trust in the brand, and promote purchase intention. In this framework, the independent variable is the green label (high-cost signal), whose main role is to strengthen the credibility of health claims. The mediating variable is brand trust, which includes competence trust and benevolence trust. The dependent variable is purchase intention.

Based on this theoretical logic and research model, this study proposes the following two hypotheses:

H1: Green labels, as high-cost signals, can increase consumer trust in health claims and thereby improve purchase intention.

H2: Brand trust plays a mediating role in the influence of green labels on purchase intention.

3. Empirical Analysis

This study takes Telunsu dairy products as a case because they widely use green labels and health claims on product packaging and have a strong market influence. At the same time, the main consumer group of Telunsu is highly consistent with the health- and environment-oriented consumers that this study focuses on. Therefore, this study uses a questionnaire survey to test the mechanism of how the supporting relationship between green labels and

health claims affects consumer purchase intention.

The questionnaire design was based on established scales [16, 17, 18] and was adjusted to the context of Telunsu products with green labels and health claims. The questionnaire included three parts: basic demographic information, product scenarios, and psychological mechanism measurement.

The survey was conducted online. A total of 162 questionnaires were distributed, and 153 valid questionnaires were collected, with an effective rate of 94.4%. Respondents came from urban, suburban, and rural areas, with urban young consumers as the main group, which matches the potential consumer characteristics of green and healthy dairy products. After reliability and validity tests in SPSS, the data were used for descriptive statistics and mediation regression analysis.

In this study, the independent variable is the green label, and the dependent variable is "purchase intention". All variables were measured with a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). This allows systematic testing of the role of green labels as high-cost signals in supporting health claims, and how this affects purchase behavior through brand trust.

3.1 Sample and Demographic Characteristics

This study obtained 153 valid samples. The main demographic features are as follows:

Gender: 103 female respondents (66.9%) and 50 male respondents (32.7%). Although the proportion of females is slightly higher, the gender distribution is relatively balanced.

Residence: 124 urban residents (80.5%), 20 rural residents (13.0%), and 9 suburban residents (5.8%). The sample is mainly composed of urban residents, which matches the fact that green and healthy consumers are mostly concentrated in cities.

Household Monthly Income: 10 respondents with less than 5,000 RMB (6.5%); 43 respondents with 5,000–10,000 RMB (27.9%); 60 respondents with 10,000–20,000 RMB (39.0%); 34 respondents with 20,000–50,000 RMB (22.1%); and 6 respondents with more than 50,000 RMB (3.9%). Overall, the sample is dominated by middle-income groups, with a relatively small proportion of high-income consumers.

3.2 Reliability and Validity Analysis

The reliability test shows that the Cronbach's α coefficient of the total scale is 0.847, indicating good internal consistency. The validity test shows that the KMO value is 0.824, and Bartlett's test of sphericity is significant ($p < 0.001$), indicating good structural validity of the scale.

3.3 Hypothesis Testing

3.3.1 Main Effect Test (H1)

This study first used linear regression analysis to test the mechanism of green labels (as high-cost signals) in supporting health claims and influencing consumer purchase intention. The results show that the total effect of green labels on purchase intention is significant. The regression coefficient is 0.727, the t-value is 6.966, and the significance level is less than 0.001. The overall model is significant and explains 24.3% of the variance in purchase intention. This indicates that green labels, as high-cost signals requiring certification, can strengthen consumer trust in low-cost health claims and further increase purchase intention, which confirms Hypothesis H1.

3.3.2 Mediation Effect Test (H2)

To test the mediating role of brand trust in the process where green labels support health claims and influence purchase intention (H2), this study used Haye's Bootstrap method [19] with 5,000 resamples.

The results show that the regression coefficient of green labels on brand trust is 0.737, with a t-value of 9.933 and a significance level below 0.001. This indicates that green labels can enhance the credibility of health claims in a verifiable way, thereby significantly increasing brand trust. At the same time, the effect of brand trust on purchase intention is also significant, with a regression coefficient of 0.410, a t-value of 3.736, and a significance level below 0.001. After introducing brand trust, the direct effect of green labels on purchase intention remains significant, with a regression coefficient of 0.425 and a t-value of 3.297, which shows that brand trust plays a partial mediating role.

The Bootstrap test further shows that the indirect effect of green labels on purchase intention through brand trust is 0.302, with a 95% confidence interval between 0.139 and 0.471, which does not include zero. The fully standardized indirect effect is 0.205. These results support Hypothesis H2, which means that green labels, as high-cost signals, provide credible endorsement for health claims, strengthen consumer trust in the brand, and thereby increase purchase intention.

The data of the empirical analysis is shown in Table 1:

Table 1. Analysis Results of the impact of green labels supporting health claims on purchase intention

Variables and Effects	B	Standard Error	t-value	p-value	95% CI
Total Effect Model					
Constant	0.978	0.451	2.166	0.032	
Green Label Substantiating Health Claims	0.727	0.104	6.966	0.000	[0.522, 0.932]
Mediation Path Analysis					
Substantiating Effect → Brand Trust	0.737	0.074	9.933	0.000	[0.591, 0.884]
Brand Trust → Purchase Intention	0.410	0.110	3.736	0.000	[0.193, 0.627]
Substantiating Effect → Purchase Intention (Direct)	0.425	0.129	3.297	0.001	[0.170, 0.679]

4. Summary

Based on Signaling Theory, this study empirically examined the mechanism of green labels and health claims in consumer purchase decisions. The results show that green labels, as high-cost signals, not only directly strengthen consumers' brand trust but also enhance the credibility of health claims, which in turn promotes purchase intention. Health claims, as low-cost signals, have a limited effect when presented alone. However, when supported by green labels, they can influence consumer perception more effectively. Further analysis reveals that brand trust plays a significant mediating role between green labels and purchase intention, which explains the psychological path through which label information is transformed into consumer behavior.

From a practical perspective, this study provides insights for companies in label design and marketing strategies. First, companies should present green labels and health claims together on product packaging to achieve a complementary signaling effect and reinforce consumer trust. Second, companies need to value the authority and transparency of high-cost green certifications and avoid the loss of trust caused by "false green" marketing. Finally, brands should emphasize their environmental and health value propositions in communication so that consumers can develop value resonance with the brand, further deepening brand trust and promoting purchase conversion.

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