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How Does Green Packaging Create Product Benefits? Data Analysis Applying Grounded Theory

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ABSTRACT

In retail, product packaging often shapes consumers' first impressions and critically influences purchase decisions. Green packaging communicates value that goes far beyond functionality. This study clarifies the product equity embedded in green packaging, defines each equity attribute, and consolidates corresponding measurement questionnaires. Using grounded theory content analysis, the findings indicate: (1) Green packaging benefits comprise two categories: Product Meaning and Emotional Value. (2) Products are perceived as green and sustainable when their packaging evokes three consumer emotions: satisfaction, trust, and self-association. (3) Questionnaire items for measuring these benefits were systematically organized.

Keywords: Green packaging, Product benefits, Satisfaction, Consumer trust, Self-association

RESEARCH MOTIVATION AND PURPOSE

When consumers choose sustainable products, their motivation and purchasing behavior involve complex cognitive decision-making processes (Moisander, 2007). To simplify product selection, consumers often rely on straightforward cues to assess the sustainability of a product or its packaging (Herbes et al., 2020). Green packaging serves as an effective medium, using visually and textually communicative elements to convey a brand's environmental commitments (Khizerulla & Lavanya, 2024; Schifferstein et al., 2022). However, as Yang and Zhao (2019) note, environmental claims on packaging can be confusing and are sometimes linked to greenwashing. Despite growing societal emphasis on sustainability, consumer understanding of such claims remains vague (Pedro Pereira Luzio & Lemke, 2013). Many lack the ability to interpret green claims accurately, hindering consumer education and the development of informed environmental awareness (Johnstone & Tan, 2015; Vetrivel et al., 2025). Therefore, clarifying the content and function of green equity in packaging is essential. This study aims to:

(1) Identify and define the types and characteristics of green cues used in brand packaging.
(2) Analyze and categorize questionnaire items related to green brand equity in packaging through inductive and hierarchical classification.

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Green Packaging Design Cues

Green packaging must serve both functional and environmental purposes—ensuring protection, aesthetics, and effective communication (Boylston, 2011). Consequently, it becomes not only a sustainability feature but also a key influence on purchasing decisions and commercial outcomes (Maniatis, 2016). Effective green design encompasses material selection, production processes, and lifecycle planning—such as using recyclable or biodegradable materials, reducing waste, and enabling reuse—which together lower environmental impact while enhancing consumer appeal and demand (Johnson, 2020; Koch et al., 2022). These design cues aid consumers in quickly identifying sustainable packaging, streamlining their evaluation and purchase process (Herbes et al., 2020; Li et al., 2024; Olson, 1978). This study systematically organizes these key design cues for green packaging, as presented in the following table.

Table 1: Design cues in green packaging.

Green Design Cue Name			Definition Explanation (Scholar, Year)
Cues	Structural	Packaging material	The durability of packaging materials determines whether they can adequately protect the contents. Consumers rely on simple cues to identify sustainable products. (Eberhart & Naderer, 2017; Ischen et al., 2022).
		Packaging size	The first cues consumers identify when shopping (unpackaged, overpackaged, clever shapes reducing packaging materials, packaging containers smaller or larger than the packaged product) (Magnier & Crié, 2015).
	Visual	Eco-lables	Environmental cues shape consumer attitudes toward product and packaging sustainability, informing design and material choices.(Herbes et al., 2020).
		Brands symbol	Brand familiarity influences green perception and willingness to purchase products. (Bickart & dan Ruth, 2012; Kang & Hur, 2012; MARY, 2016).
		Colour	As an eco-friendly cue, dark-toned color schemes like green and brown naturally evoke an environmentally conscious feel. (Seo & Scammon, 2017; Wood et al., 2018)
		Picture/ image	Images such as leaves symbolizing greenery and the Earth can serve as eco-friendly and sustainable reminders. (Underwood, 2003).
	Information	Numerical information	Highly specific, reflecting a clear and concrete relationship with specific product attributes. （如：32kg/mps）(Gleim et al., 2013).
		Verbal information	More abstract than numerical information, yet carrying greater intrinsic meaning (e.g., high carbon footprint) (Gleim et al., 2013).
	Sensory	Sensory	Consumers use their hands to feel and judge a product's naturalness based on sensation; roughness, warmth, and softness are sensory cues associated with nature. (Karana, 2012).

Impact of Green Brand Equity

Keller (1993) categorizes brand associations into three dimensions: attributes, benefits, and attitudes, suggesting that brand equity transfers brand knowledge to consumers, influencing their response to marketing. Aaker (1991) defines brand equity as "a set of brand assets and liabilities linked to a brand's name and symbol, which add or subtract value for the firm and its customers." Based on this, green brand equity is defined as "a set of brand assets tied to the brand's name and symbols that deliver positive value related to environmental commitments and issues" (Chen, 2010). These assets stem from consumers' perceptions of brand image, satisfaction, and trust, with brand image being the most critical—defined as "a set of consumer perceptions and memories regarding a brand's environmental commitments and attributes" (Burmann et al., 2009).

Research on how consumers judge sustainability through packaging shows that both U.S. and European consumers rely on eco-labels as decision cues (Figure 1). U.S. consumers also use textual information on packaging (Figure 2), while French consumers distrust published claims and place greater trust in packaging appearance and material feel (Figure 3) (Herbes et al., 2020; Steenis et al., 2017; Zeithaml, 1988). This is because brands use eco-labels and text to convey an environmentally responsible image, strengthening sales and loyalty (Kolović et al., 2023; Saeed et al., 2025). Oversized packaging that mismatches product volume significantly reduces green trust and purchase intent (Alhamdi, 2020; Goyal et al., 2018). Beyond packaging design, brand identity also plays a key role: established brands with green packaging, such as Closeup toothpaste, elicit stronger purchase intent than lesser-known brands (Yonalia & Bahri, 2025). Today, integrating green cues into packaging has become a common strategy for enhancing green brand equity.

Figure 1: Common eco-labels.

Figure 2: Textual information.

Figure 3: Visually trustworthy packaging.

Research Methodology

This study adopts a case study approach to organize content on green brand equity in packaging design. First, literature was screened using the keywords "packaging design," "green brand," and "brand equity." Second, the timeframe was limited to 2010–2020, focusing on papers with over 500 citations. Finally, only studies that explicitly included questionnaire items were included. Literature published up to 2025 was not considered, as the questionnaires selected needed to demonstrate temporal and market validity, avoiding recently published items that may lack established reliability. In total, six questionnaires were selected. All items were consolidated into raw textual data for preliminary analysis of green brand equity. The raw data comprised 4,378 words, which were converted into 71 text samples for analysis. The research process consisted of two phases: Phase One involved the screening and acquisition of raw questionnaire data; Phase Two involved coding and analysis of this data.

Grounded Theory was employed to analyze textual content within the green brand equity questionnaire items. This methodology facilitates

an abstract understanding of emerging textual themes within the research domain and clarifies their meanings (Charmaz & Thornberg, 2021). Developed by sociologists Glaser and Strauss, Grounded Theory proposes a three-level coding process for data analysis: open coding, axial coding, and selective coding (Glaser & Strauss, 2017). These codes are interrelated, requiring researchers to compare and establish connections among them.

The analysis followed these steps (Strauss & Corbin, 1998; Strauss, 2017) using NVivo 12.0 for qualitative data analysis: (1) Raw textual data in Word format was imported into NVivo. (2) Sentences or words with similar meanings were marked as codes, forming text samples. (3) Open coding was performed by grouping related or similar contexts or behaviors into distinct properties. (4) Axial coding grouped properties with shared characteristics into broader dimensions. (5) Selective coding integrated all dimensions into a limited number of core categories.

RESULT

This study conducted data analysis and organization of product attributes using the textual content of questionnaire items titled "Packaging Green Brand Equity." Researcher coding employed the inter-rater reliability formula R = 2M/(N1+N2) to assess reliability, where R represents reliability, M denotes the number of codes with complete agreement, and N1 and N2 represent the coding counts of the two researchers, respectively. Calculations yielded a reliability coefficient of 0.85 for textual coding. The reliability test results achieved a high consistency standard within the acceptable reference range of 0.7–1 (Holsti, 1969; Malek & Tabesh, 2023).

The two researchers tagged 4,378 characters of raw data into 71 textual samples, which were open-coded into 15 properties. Specific events and open-coded categories are presented in Table 2.

Table 2: Packaging green product equity open coding and issue explanation.

Open Coding	Instruction	Combined Questionnaire Questions
Safety and Legality	The product is harmless to humans and the environment and is legally compliant.	I believe this product is safer for both people and the environment.
Material Usage	The materials used in product packaging are environmentally friendly.	I believe product packaging should use recyclable materials whenever possible.
Eco-Certification	Eco-labels serve as indicators for identifying and trusting products.	I believe eco-certification labels on products are the first thing I notice.
Public Recognition	The social image benefits derived from the product.	I believe using eco-friendly products makes me look better in my friends' eyes.

(Continued)

Table 2: Continued.

Open Coding	Instruction	Combined Questionnaire Questions
Attitude Preference	Brand preference generated by its environmental attributes.	I believe brands that prioritize environmental protection earn my preference.
Positive Imagry	The brand's social reputation and successful standing.	I believe brands actively committed to sustainability are generally trustworthy and reputable.
Design Philosophy	The environmental philosophy and educational value conveyed through packaging.	I believe packaging design should serve a purpose beyond merely containing the product.
Value Perception	Rational assessment of the product's cost-effectiveness.	I believe this product offers good value for money.
Quality Perception	Rational evaluation of the product's craftsmanship and quality.	I believe eco-friendly products typically maintain high quality.
Trust	Belief in the reliability of the product's environmental commitments.	I believe this product's environmental commitments are genuine and credible.
Satisfaction	Emotions such as joy and satisfaction derived from using the product.	After buying eco-friendly products, I feel happy and satisfied.
Loyalty	Willingness to repurchase or recommend the product in the future.	I will continue buying this product and won't switch easily.
Self-Connection	Strong emotions like passion and desire toward the brand.	I feel using this product expresses my personal values and attitudes.
Attachment	Deep integration of the brand with personal identity.	The product's philosophy makes me passionate about it.
Green Behavior	Positive evaluation of the act of purchasing green products itself.	I believe purchasing green products is the right thing to do.

Source: this study

The main axis coding comprises four dimensions: Product Performance (12.7%, n = 9), Product Imagery (26.7%, n = 19), User Experience (33.8%, n = 24) , and Purchase Value (26.8%, n = 19). The selection codes were categorized into two major groups: Product Meaning (39.4%, n = 28) and Emotional Value (60.6%, n = 43). These two categories collectively constitute the product equity of green packaging. In-depth analysis revealed that green packaging product benefits encompass both product-related attributes and additional emotional attributes derived from the product. Properties identified in open coding, ranked from highest to lowest frequency, were: Self-association (14.1%, n = 10), Trust (12.7%, n = 9), Satisfaction (12.7%, n = 9), Loyalty (8.5%, n = 6), Attachment (8.5%, n = 6), Material Usage (7.0%, n = 5), Perceived Value (7.0%, n = 5), Public Recognition (5.6%, n = 4), Attitudinal Preference (4.2%, n = 3), Positive Image (4.2%, n = 3), Behavioral Intention (4.2%, n = 3), Safety and Legality

(2.8%, n = 2), Eco-Label (2.8%, n = 2), Design Philosophy (2.8%, n = 2), and Perceived Quality (2.8%, n = 2), The number of codes for each stage is presented in Table 3.

Table 3: Packaging green product equity code results and quantity.

Stage 1		Stage 2		Stage 3	
Open coding (property)	**Number of Codes (n) / %**	**Axial coding (dimension)**	**Number of Codes (n) / %**	**Selective coding (category) Number of Codes (n) / %**	**Total**
Safety and Legality	2/2.8%//	Product Performance	9/12.7%	Product Meaning	Green Packaging Product Equity
Material Usage	5/7.0%			28/39.4%	
Eco-Certification	2/2.8%				
Public Recognition	4/5.6%	Product Imagery	19/26.7%		71/100%
Attitude Preference	3/4.2%				
Positive Image	3/4.2%				
Design Philosophy	2/2.8%				
Value Perception	5/7.0%				
Quality Perception	2/2.8%				
Trust	9/12.7%	User Experience	24/33.8%	Emotional value	
Satisfaction	9/12.7%				
Loyalty	6/8.5%				
Self-Connection	10/14.1%	Purchase Value	19/26.8%	43/60.6%	
Attachment	6/8.5%				
Green Behavior	3/4.2%				

Source: this study

CONCLUSION

Today, the green brand equity conveyed through packaging is categorized into two main dimensions: Product Meaning and Emotional Value. Product meaning represents the fundamental practical value consumers seek when purchasing products. Product performance (12.7%, n = 9) signifies that packaging materials must be safe, legally compliant, and environmentally

friendly. Product image (26.7%, n = 19) conveys quality and value perceptions to consumers while shaping the brand's green image. On the Emotional Value level within consumer psychology, this includes usage emotion (33.8%, n = 24) and purchase value (26.8%, n = 19). The most valued attributes for consumers are whether the product forms a strong emotional connection with them and whether it delivers satisfaction and trust.

This study recommends expanding future research from single-product benefits to green brand equity, conducting more detailed investigations into areas such as corporate responsibility and consumer behavior. This will ensure packaging can more effectively communicate green brand equity benefits to consumers.

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