

THE INFLUENCE OF VISUAL COMMUNICATION OF FOOD PACKAGING DESIGN ON CONSUMER PERCEPTION AND PURCHASING INTENTIONS: A SYSTEMATIC LITERATURE REVIEW

JIANAN WANG¹, NORMAH, MUSTAFFA², MAIZATUL HAIZAN, MAHBOB³

^{1, 2, 3} FACULTY OF SOCIAL SCIENCES AND HUMANITIES, UNIVERSITI KEBANGSAAN MALAYSIA, 43600, MALAYSIA

ABSTRACT. Food packaging design plays a crucial role in consumer decision-making by functioning as protective packaging and a significant medium of visual communication. Practical visual elements in packaging can strongly influence consumer perceptions, emotional responses, and purchasing behavior. This systematic literature review investigates the influence of three core visual elements—color, imagery, and shape—on consumer perceptions, health-related perceptions, emotional responses, and purchasing behaviors. An extensive literature search followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines across six databases: Web of Science (WOS), SCOPUS, Emerald, Science Direct, EBSCO, and Wiley. Articles included were limited to those published in English, resulting in the selection of 109 relevant articles. The analysis of the reviewed studies reveals that visual elements significantly enhance consumers' information processing, shaping their attitudes and influencing their purchasing decisions. Findings highlight the interdisciplinary nature of packaging design, combining insights from marketing, psychology, and visual design studies. This literature review provides essential insights into how visual communication in food packaging—especially chocolate packaging—impacts consumer purchase intentions. It offers valuable guidelines for practitioners and researchers in marketing and design, suggesting that aligning packaging visuals with consumer expectations and psychological drivers can substantially improve product attractiveness and market success.

Keywords. Visual communication, Packaging design, Consumer perception, Purchase intentions

1. INTRODUCTION

Food packaging design significantly impacts consumer purchasing behavior by acting as both a protective element and a vital communication tool. Packaging visually connects products with consumers, influencing their perceptions, emotions, and purchasing decisions. The rapid development in visual communication techniques within food packaging design, such as interactive digital media and multi-sensory packaging, underscores its complexity and relevance in today's competitive market. Despite these advancements, there remains a reliance on traditional intuitive methods in visual packaging design, highlighting a gap between contemporary research insights and practical application in the industry.

Recent studies emphasize the critical roles of visual elements like color, imagery, and shape. Spence and Van Doorn (2022) indicate that these elements affect consumer attention and expectations, particularly in environments requiring rapid decision-making. Similarly, recent research utilizing modern technologies, including artificial intelligence and neuroscience methods like event-related potentials (ERP), has provided more profound insights into how consumers perceive packaging visuals, underscoring the need for evidence-based strategies in packaging design (Rojas et al., 2024; Naranjo-Guevara et al., 2023).

Given this context, the primary purpose of this systematic literature review is to synthesize existing knowledge on how visual elements—color, imagery, and shape—influence consumer purchasing behavior, particularly within food packaging. This review aims to clarify theoretical understandings, identify gaps, and propose directions for future research.

Specifically, this study investigates the following hypotheses:

H1: Color in food packaging significantly influences consumer purchasing behavior.

H2: Imagery in food packaging significantly influences consumer purchasing behavior.

H3: Shape in food packaging significantly influences consumer purchasing behavior.

The insights gained through this review will offer practical guidelines for professionals and researchers aiming to optimize packaging design to enhance consumer engagement and market success.

2. MATERIALS AND METHODS

This study employs a systematic literature review (SLR) methodology to investigate the impact of visual elements in packaging design on consumer purchasing behavior. Following established systematic review guidelines, this research includes a bibliographic analysis, which quantitatively summarizes publication details such as journal titles, publication years, and key thematic areas (Campos et al., 2017). This approach ensures comprehensive coverage, transparency, and methodological rigor in synthesizing existing research findings.

2.1. Systematic Literature Review

This systematic literature review (SLR) follows Moher et al.'s (2015) guidelines to evaluate the influence of visual elements in packaging design on consumer behavior. The review process consists of four steps outlined by PRISMA, including a comprehensive bibliographic analysis considering publication year, journal titles, research areas, countries, universities, and methodologies. Databases searched between February and March 2025 included Web of Science (WoS), Scopus, EBSCO, Emerald, Wiley, and Science Direct. This review did not register its protocol in a systematic review database.

The literature search utilized keywords and Boolean operators ("Pack*," "visual," and "food*") to retrieve relevant publications from databases, including Web of Science, Scopus, EBSCO, Emerald, Science Direct, and Wiley. Only English-language articles with full texts available were considered. Initially, 3,009 articles were identified; after applying defined exclusion criteria, which involved removing irrelevant studies (e.g., tourism, service, software, energy, policy, logistics, healthcare packaging), the final selection included 375 references for analysis (Table 1).

Table 1. Systematic literature review protocol

Stage	Description	Number
Identification	Articles identified from databases	2963
	Excluded after abstract screening	1940
Selection	Articles after screening abstracts/titles	1023
	Duplicates excluded	205
Eligibility	Full text articles assessed	818
	Articles excluded after full-text assessment	443
Inclusion	Articles included in final review	375

2.2. Search Criteria and Selection

Eligibility criteria were established to select relevant articles for inclusion in this review. Eligible articles had to meet the following criteria: 1) empirical studies (quantitative or qualitative), excluding review articles, opinion papers, viewpoints, conference papers, and abstracts; 2) published between January 2014 and December 2024; 3) written in English; and 4) primarily focused on the influence of packaging design on consumer purchasing behavior or visual communication related to food packaging.

In the selection phase, 1023 articles were initially included, with 205 duplicates subsequently removed. During the eligibility stage, 818 articles underwent detailed review, resulting in 443 exclusions based on predefined criteria, primarily due to insufficient relevance to packaging design's impact on consumer purchasing behavior. Literature published in non-English languages, conference papers, book chapters, and reviews were also systematically excluded. After applying the PRISMA and PICO guidelines for screening titles and abstracts, 375 relevant studies remained, including 36 reviews. Descriptive data extracted from these studies were organized and analyzed using Excel

spreadsheets to calculate frequency and percentages, ensuring data accuracy through careful validation by the authors. Table 2 summarizes the search results and criteria applied to each database.

Table 2. Results and search string in each source

Sources	Search String (brief)	Research Date	First Search	Excluded	Analyzed
Web of Science	AB, TS, TI: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	5 Feb 2025	1074	837	237
Scopus	TITLE-ABS-KEY: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	9 Feb 2025	323	283	40
EBSCO	AB, SU, TI: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	11 Feb 2025	566	553	13
Emerald	AB, TI: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	13 Feb 2025	567	530	37
Science Direct	Articles: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	17 Feb 2025	262	224	38
Wiley	TITLE-ABS-KEY: visual/color/shape/imagery/graphic & food/drink/beverage/chocolate & packaging	20 Feb 2025	171	161	10

2.3. Data Analysis

Each study included in this review was synthesized using a structured data extraction approach. Meta-analysis, defined by Glass (1976), offers a rigorous method for quantitatively analyzing and summarizing existing research outcomes. This technique enables the integration of findings from multiple quantitative studies, effectively minimizing sampling and measurement errors from individual studies and thus enhancing overall validity (Yu et al., 2017). Additionally, meta-analysis systematically addresses and explains discrepancies across study results, providing a more accurate and comprehensive understanding of the topic (Hameed & Counsell, 2014). By combining quantitative and qualitative methodologies, meta-analysis reduces biases related to sample limitations, contextual variations, and subjective researcher biases inherent in single studies, leading to more robust and objective conclusions (Peng et al., 2024). The primary steps of meta-analysis—identifying research topics, conducting literature searches, screening relevant articles, data coding, quality assessment, and statistical analyses—were strictly adhered to in this review.

3. RESULTS

A total of 2963 documents from six databases were identified and screened following PRISMA guidelines (Page et al., 2021). Abstract screening excluded 1940 articles (approximately 65.47%) primarily because they focused on unrelated topics such as healthcare packaging, nutritional information, chemical impacts on food, software, policy, sustainability, or environmental concerns. Subsequently, the full texts of 1023 articles were reviewed, resulting in the removal of 205 duplicates. A detailed examination of the remaining 818 articles excluded 443 additional studies due to irrelevance, such as focusing on environmental aspects, nutrition, chemical analysis, or lacking direct connections to visual packaging elements influencing consumer buying behavior. Ultimately, 375 studies were included for comprehensive analysis, comprising 40 empirical studies and 315 literature reviews. Table 3 summarizes the articles, excluding literature reviews.

Table 3. The overview of the articles without literature review

References	Design	Sample	Population	Analysis Methods	Key Findings
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Farooq et al. (2015)	Questionnaire	161	Adults	Descriptive, correlation	Color, shape, imagery affect purchase intentions.
Poturak (2014)	Survey	300	Sarajevo citizens	Descriptive, regression	Attractive packaging boosts appeal, trust, purchase.
Ahmad et al. (2015)	Interviews	16	Facebook Doritos fans	Case study	Attractive packaging enhances perceived quality.
Wang et al. (2023)	DEMATEL, interviews	146	Experts/students	DEMATEL	Design boosts consumer interaction with snack foods.
Ling et al. (2024)	Expert interviews	2	China/USA experts	Comparative, content	Aesthetic design influences consumer emotions and decisions.
Dhariyal & Kothari (2017)	Questionnaire	N/A	Cadbury buyers	Factor, regression	Color, branding affect impulsive buying.
Muthusamy et al. (2024)	Quantitative	N/A	Adults 18+	PLS, SEM	Emotional engagement boosts competitiveness.
Luo et al. (2019)	Interviews	200	UK/China	ANOVA	Color impacts taste/health perception.
Patel et al. (2024)	E-Questionnaire	260	Ahmedabad, Rajkot	Comparative	Strategic packaging impacts buying decisions.
Junfeng & Halabi (2024)	Focus group, interviews	7	Parents, children	Thematic	Bright imagery captures children's attention, loyalty.
Récky et al. (2023)	Survey	565	Age 15–64	PCA, cluster analysis	Visual mascots enhance brand engagement.
Yadav (2024)	Exploratory, causal	N/A	Adults	Descriptive, regression	Distinct shapes/colors evoke emotions, drive buying.
Fonseca et al. (2023)	Survey	727	Adults	Word association	Colors evoke nature, health perceptions.
Suwandari et al. (2024)	Survey	175	MSME food buyers	SEM	Visual/verbal packaging influence food quality perceptions.
Chu et al. (2022)	Interviews	25	UK adults	NVivo	Health/portion cues in packaging affect choices.
Belliza & Kusumawati (2024)	Survey, interviews	434	Generation Z	Path analysis, NVivo	Illustrations strongly influence Gen Z purchasing.

Marques et al. (2019)	Experimental	50	Brazil adults	Factor analysis	Color/shape influence taste perceptions.
Ismail (2019)	Questionnaire	185	Gen Y	Regression	Packaging features significantly affect buying.
Song (2023)	Conceptual	N/A	Conceptual	Conceptual analysis	Packaging conveys culture, enhances consumer experience.
Zhang et al. (2023)	Focus group	116	Chinese adults	Thematic	Label design influences purchase intentions.
Rajkumar & Jain (2021)	Literature review	29	Articles	Literature review	Packaging features strongly impact buying.
Sastre et al. (2022)	Systematic review	472	Articles	Context analysis	Packaging design impacts and communication.
Reppa et al. (2022)	Experimental	112	Students	ANOVA	Aesthetic enhances visual attention.
Hagtvedt (2023)	Literature review	48	Articles	Literature review	Aesthetic affect consumer psychology.
Yuting & Mohamed (2023)	Interviews	12	Adults	NVivo	Effective packaging boosts sales, profitability.

3.1 Influence of Packaging Design

Packaging design significantly influences consumer purchasing behavior and functions as a strategic marketing tool. Elements such as design, graphics, color, and materials positively correlate with consumer purchase intentions, affecting decision-making at the point of sale and playing a crucial role in marketing communications (Farooq et al., 2015; Poturak et al., 2014). Ahmad et al. (2015) further emphasized packaging's dual role in protecting the product and stimulating impulse buying through visual appeal and informational content.

Specific visual characteristics—particularly color, shape, imagery, lines, and typography—have been highlighted as influential in consumer decisions, with imagery identified as the most impactful factor (Wang et al., 2023). Additionally, aesthetic elements such as color and design significantly attract consumer attention and evoke emotional responses, influencing purchasing behavior (Ling et al., 2024). Dhariyal et al. (2017) confirmed the importance of brand identity and color in driving impulse purchases.

Recent studies, including those examining niche markets such as Northeastern China's cereal agricultural products, indicate that integrating traditional motifs with modern graphics significantly enhances consumer preferences and purchasing decisions (Ling et al., 2024). Overall, packaging effectively conveys product information and reinforces brand identity, which is vital to consumer trust and informed purchasing decisions.

3.2 Influence of color

Research consistently highlights the significant influence of food packaging design—particularly color—on consumer purchasing behavior. Packaging color strongly affects consumer perceptions, emotional responses, and purchase intentions. Studies indicate that specific colors evoke distinct consumer associations; for instance, red often suggests tastiness, enhancing hedonic perceptions of high-calorie foods like chocolate (Huang et al., 2021), while green commonly signifies healthiness and sustainability (Luo et al., 2019; Kauppinen-Räsänen & Luomala, 2010). Bright, contrasting colors frequently stimulate impulse buying behaviors (García-Madariaga et al., 2021).

Furthermore, color significantly influences perceptions of product quality and healthiness, impacting consumer decisions (Yadav, 2024). This is particularly evident among specific consumer groups; for example, children are

highly responsive to packaging visuals such as colors, characters, typography, and graphics, directly affecting their food preferences and brand engagement (Wang et al., 2024).

Additional research underscores the combined effect of visual elements like imagery, shape, typography, and line in packaging design, with imagery being notably influential (Wang et al., 2023). Patel et al. (2024) emphasize the strategic importance of packaging in brand differentiation and loyalty through the effective use of color, imagery, and positioning. Emotional engagement is further enhanced by visually appealing elements such as mascots and emotive graphics (Barnuevo et al., 2023), while colors like green, yellow, and white foster positive associations with nature, health, and quality, significantly influencing consumer preferences and product attractiveness (Fonseca et al., 2023). These findings collectively advocate for a strategic and innovative approach to packaging design, aiming to optimize consumer engagement and brand marketability.

3.3 Influence of imagery

Imagery and color significantly influence consumer perceptions and purchase intentions in food packaging design. Specific colors like red are frequently associated with enhanced taste perceptions, while green is linked to health attributes (Luo et al., 2019). Appropriate imagery can further amplify these effects by improving consumer trust and transparency, particularly in convenience food categories (Underwood & Klein, 2002). Visual and verbal elements on packaging directly affect perceived food quality, influencing consumer purchasing decisions and potentially mediating their choices (Suwandari et al., 2024).

The imagery on packaging can evoke emotional connections, positively reinforcing brand associations (Ares & Deliza, 2010). Conversely, misleading imagery can diminish consumer trust (Magnier & Schoormans, 2017). Research by Patel et al. (2024) underscores the strategic importance of visual elements, including imagery, color, and branding, in establishing brand differentiation and loyalty. Moreover, eco-friendly packaging materials and appealing illustrations significantly enhance perceived product quality and practicality (Belliza et al., 2024).

Distinct visual elements, such as imagery depicting human activity (e.g., running), can enhance functional product perceptions, especially in energy beverages (Li et al., 2021). Cultural factors also influence visual element effectiveness; for instance, dragon imagery can signify premium quality in Asia but may carry negative connotations in Western markets (Dubois et al., 2020). Additionally, realistic images of unadorned products foster consumer trust, particularly regarding healthy foods, whereas abstract art can heighten perceptions of luxury (Kim et al., 2019; Lee & Kim, 2022).

3.4 Influence of Shape

Recent research highlights packaging design as a significant determinant of consumer buying behavior, particularly emphasizing wrapper design, color schemes, and shapes. Ismail (2019) identifies wrapper design as highly influential among Generation Y consumers. Yadav (2024) emphasizes that packaging elements like color and shape strongly affect consumer perceptions of product quality and healthiness, influencing purchase intentions. Similarly, Marques et al. (2018) found that rounded shapes and colorful packaging enhance taste expectations and consumer preferences. Chu et al. (2022) demonstrate how packaging design can encourage healthier consumer choices and portion control. Further, Wang et al. (2023) highlight the importance of specific visual elements—color, imagery, shape, lines, and typography—with imagery identified as the most impactful in shaping purchase decisions. Practical studies show distinctive packaging shapes significantly boost brand recognition, shelf visibility, and consumer interest; for instance, uniquely shaped products like Evian bottles achieve high brand recognition (Ampuero et al., 2023), and easy-to-use packaging increases consumer repurchase rates (Otero et al., 2025).

Moreover, premium structural features such as glass jars and metallic finishes effectively signal higher quality, influencing consumer perceptions and willingness to pay (Wansink, 2004). Orth and Malkewitz (2008) reinforce that unique shapes significantly enhance consumer curiosity and differentiation in competitive markets. These findings underscore the strategic role of packaging design elements in enhancing consumer attraction, brand differentiation, and market competitiveness.

4. DISCUSSION

This systematic literature review examines recent research to determine how visual elements in food packaging—precisely color, shape, and imagery—influence consumer perceptions, emotional responses, and purchase intentions. The analysis included 40 experimental studies and 315 empirical articles, consistently emphasizing these visual elements' significant role in shaping consumer behavior.

Color emerges as a crucial visual cue influencing emotional and cognitive processes. Warm colors (red, yellow, orange) stimulate appetite and impulsivity, making them practical for snacks and fast-food packaging. Conversely, cool colors (blue and green) signify health, freshness, and tranquility, suitable for organic or diet-oriented products (Huang et al., 2021). Cultural variations further influence color perception; for instance, red symbolizes urgency in Western contexts but luck and celebration in Eastern cultures (Barnuevo et al., 2023).

Packaging shape significantly impacts consumer preferences, with curved designs perceived as comforting and indulgent, commonly used in sweets and dairy products. In contrast, angular shapes convey professionalism and luxury, appropriate for premium products (Song, 2023; Ampuero et al., 2023). Ergonomic and functional shapes enhance usability, influencing repeat purchases, while shape proportions also affect perceived portion sizes and health perceptions (Ampuero & Vila, 2006).

Imagery, including illustrations, graphics, and mascots, effectively communicates brand identity, influences consumer expectations, and builds trust and transparency (Suwandari et al., 2024; Belliza et al., 2024). Moreover, consistency among these visual elements enhances brand recognition and consumer appeal, while inconsistencies may cause confusion and negatively impact purchasing decisions (Patel et al., 2024).

5. CONCLUSION

This systematic literature review highlights the significant impact of visual elements—color, imagery, and shape—in food packaging design on consumer purchasing behavior. The findings support the hypothesis that packaging design elements, particularly color, imagery, and shape, critically influence consumer perceptions, emotional responses, and purchase intentions.

Color emerges as a powerful element, influencing consumer expectations and emotional responses, such as associating red with taste and green with healthiness. Imagery significantly impacts consumer trust and perceived product quality, mainly when realistic visuals accurately reflect product attributes. Moreover, packaging shapes substantially affect consumer preferences, usability perceptions, and purchasing behaviors. Curved and ergonomically designed packaging is preferred for specific product types, while unique shapes enhance shelf visibility and consumer curiosity. The findings confirm our hypotheses, highlighting that visual packaging elements—color, imagery, and shape—strongly influence consumer purchasing decisions. These design aspects directly enhance consumer engagement, perceived quality, and brand loyalty, demonstrating their strategic value in competitive markets. The results underscore the importance of aligning packaging design with consumer expectations and psychological factors to optimize marketing effectiveness.

Future research should explore cultural influences on visual packaging elements and their differential impacts across various consumer demographics and product categories. Additionally, experimental studies focusing on real-world consumer behavior and neuropsychological methods could provide deeper insights into the cognitive processes behind packaging perception and decision-making, thus enhancing the practical application of these findings in marketing strategies.

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