



A Systematic Review of Design Factors Affecting the Consumer Behavior

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Abstract-

Background: Consumers play a vital role in the market because they decide whether to purchase a product. This study aims to identify the design factors that influence consumer behavior. We hypothesize that design is a key factor that collectively shapes purchasing preferences and brand loyalty.

Materials and methods: The study was conducted using Google Scholar, Scopus, Elsevier, ProQuest, and ACM Digital Library from January 2013 to December 2023, employing various combinations of the following keywords: Visual Design, Packaging, and Consumer Behavior. The research was derived from the findings of 18 articles out of a total of 5,290 articles obtained through a keyword search.

Results: The results showed that the design factors, including color, photos or images, and shape, influenced the consumer behavior in purchasing a product. In addition, eco-friendly packaging has a big impact on the younger generation. However, the product label influences consumer preferences.

Conclusion: The design, functionality, and aesthetic appeal of food and beverage packaging are fundamental factors that influence consumer behavior, acting as both a protective measure for product quality and a persuasive tool for market engagement.

Keywords: Design, Consumer Behavior, Packaging, Food Label, Retail, Sustainability.

I. INTRODUCTION

The visual aspect of packaging holds special importance in the food purchasing process due to its role in establishing direct relationships with customers and its impact on the customer's perception[1]. The subjects, food, and beverage package design had the most influence in the market, possibly because food is an essential product [2], such as product packaging that has a great potential to serve as a medium for product-related information. All the information, both pictorial and textual, attracts the attention of a consumer and can arouse the desire to buy the food product[3]. Thus, it is necessary to determine the reason when purchasing decisions, since consumers primarily depend on the visual design of packaging and their expectations regarding product quality. Understanding the appropriateness of specific visual elements on product packaging is critical for effective design that influences the purchasing choices of consumers, such as food product[4]. Previous studies have examined aspects of food packaging to some degree, specifically focusing on the impact of visual images on consumer behavior. Their purpose is to investigate how consumer-related factors, brand image, and store familiarity affect purchasing behavior for products [5].

Furthermore, the design of the product packaging indicates that the typeface can influence the illustration of a product. A study by Kovacevic et al., found that the typeface influenced the participants' choice and their expectations of product quality[4]. It is also stated in another research that packaging and labels can significantly influence the price of the product itself[6, 7]. Moreover, significant price



differences observed for food label designs and label colors suggest that products differ in their packaging characteristics leading to different price levels for consumer behavior [8]. At the same time, Chitturi et al. found that the color of the bottle using a blue cap or an anthropomorphic shape improves consumer preference and quality perceptions [9]. Still, the color and shape can influence the packaging directly influence the purchase intention of products [10]. In other words, visual attractiveness plays a significant role in terms of affecting consumer behavior due to its design elements. Thus, determine the several factors could be have an impact on consumer behavior.

The design of new products must consider attributes associated with the basic and practical use of a product as well as those attributes that mark a comparative difference in the product category [11]. Evaluating a product or service, the consumers need to find the information to determine which specific product will meet certain criteria. For instance, concerning the product quality for the purchaser's willingness to buy a product will increase the purchase intention [12]. However, a study by Fall et al. found that the processes involved in consumer judgments among participants of different ages indicated that age groups have different attitudes and reasons for purchasing a product. [5]. At the same time, Jisana et al. found that consumer purchases are influenced strongly by cultural, social, personal, and psychological characteristics [13]. Thus, reasons such as product category, quality, and social may be influenced to decide on whether to purchase a product.

In order to create value for consumers and profits for organizations, also understand why consumers behave in certain ways to a variety of products and services offered [14]. Consumer behavior involves many variables, so it's rather complex. There could be variables otherwise to do with external environmental influences, cultural, social class, family, and personal influences [14]. Thus, packaging is now often paired with digital design and interactive media to enhance the attractiveness of a product to increase consumer demands [15].

There is currently limited evidence to suggest and summarize the design factor that affects consumer behavior, so it is necessary to do so. This study aims, to provide a summary of the design factors that affect consumer behavior in making actual buying decisions. For this reason, with the continuous development of advertising media, people are increasingly paying attention to some designs. Hence, the objective of this article is to systematically review research published from 2013 to December 2023 which contributes to answering the following three interconnected research questions (RQs):

RQ1: How does packaging material affect consumer behavior?

RQ2: What are the design factors on packaging affects purchase intention?

RQ3: What factors influence consumer behavior?

To ensure sufficient quality of the research, the reviewed literature is limited to peer-reviewed publications reporting primary data. This means primarily journal articles, but other scientific publications may also be included if they report studies that are assessed to be of sufficient scholarly quality to be publishable in a peer-reviewed academic journal. However, this manuscript has 5 sections, the introduction section in the first part, the second is the material and method section, the third results and the fourth is the discussion section and lastly is the conclusion.

II. MATERIAL AND METHOD

The systematic review respected the PRISMA guidelines of Preferred Reporting Items of Systematic Reviews [16].

2.1 Search strategy

A systematic search was performed in SCOPUS, ProQuest, and ACM Digital Library from 2013 January to December 2023, articles in peer-reviewed English-language journals. Defined categories were collected using Visual Design OR Packaging OR Consumer Behavior. Supplementary searches were performed by



examining the reference lists of the identified full-text articles. Only peer-reviewed academic journal articles were included, while reports, books, and other non-academic sources were excluded. The focus remained on studies relevant to consumer behavior and design. Additional filters were applied to refine the dataset and enhance clarity. These included the exclusion of medical-related publications, review or meta-analysis articles, newspaper content, and other non-relevant sources. Reference list searches (i.e., backward reference searches) and cited reference searches (i.e., forward reference searches) were conducted on full-text articles that met the study selection criteria identified through the keyword search. Articles identified from the backward and forward reference searches were further screened and evaluated based on the same study selection criteria. All newly identified articles were researched until no additional relevant articles were found.

2.2 Inclusion and exclusion criteria

This systematic review included randomized inclusion of case reports related to the effects of visual design on packaging and the factors that influence consumer choice or behavior.

Inclusion Criteria:

- Research on the factors of consumer purchase under the influence of packaging or visual design.
- Information derived from the results of various findings of different products, labels, and services regarding their package design or label design.
- Information regarding the design factors.

Exclusion Criteria:

- Studies not discussed on visual design, consumer behavior and packaging.
- Insufficient information on defined visual design and consumer behavior used.
- Systematic reviews & meta-analysis paper.
- Animal studies

2.3 Data extraction

Two independent investigators (J.Y.L and Y.P) systematically collected data, including publication date, author, study design, and characteristics. Data extraction focuses on the design factors that affect consumer behavior. The studies included in this review provided insights into the relationships between packaging materials and consumer responses, visual design elements (e.g., color, shape, layout) and consumer engagement, as well as product-related attributes and their impact on consumer decision-making. A variance of the included studies was described in the tables to determine the results. Our analysis primarily examined the design factors that affect consumer behavior. The primary focus of our analysis was to examine how different design factors potentially affect consumer behavior, with the aim of synthesizing existing evidence and identifying patterns that could inform future research and practical applications in product and packaging design.

III. RESULT

3.1 Study selection

Figure 1 shows the study selection flow chart. We identified a total of 5,290 articles by the keyword search, including 4,191 articles from Scopus, 99 articles from ProQuest, and 1,000 articles from the ACM Digital Library. After removing 14 duplicates, 5,276 unique articles entered title and abstract screening. Then, 4,967 articles were excluded, with the reasons. The full texts of the remaining 310 articles were reviewed against the study selection criteria. The reasons for exclusion included the following: the articles do not discuss visual design, consumer behavior, and packaging. A forward and backward reference



search was conducted based on the remaining 18articles (see Table 1).

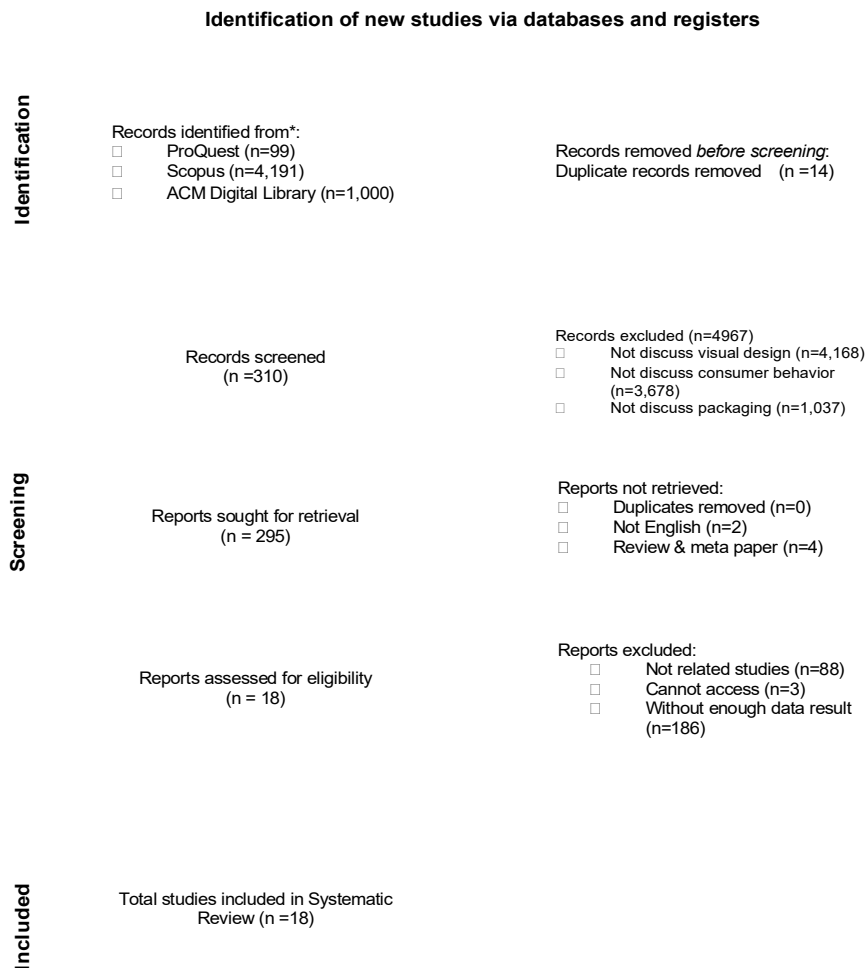


Figure 1. The PRISMA diagram.

3.2 Characteristics of Selected Studies

The basic characteristics of the included studies are summarized in **Table 1**.

Table 1. Characteristics of selected studies.

Studies	Title	Subject (n)	Country	Product	Design
Kovačević, Mešić et al. 2022	The influence of packaging visual design on consumer food product choices	154	N/A	Spice	Typeface and Ingredient depiction
Lan, Phuong et al. 2023	Factors Affecting the Purchase Intention of Products with Environmentally Friendly Packaging of Urban Residents in Ho Chi Ming City, Vietnam	485	Vietnam	N/A	Packaging material
Liu, Lyu et al. 2020	Consumer Marketing Brand Cultivation Path Based on Image	40	N/A	Food products	Packaging



Recognition Technology						
McKerchar, Smith et al. 2020	Kids in a candy store: An objective analysis of children's interactions with food in convenience stores	37	New Zealand	Food and Drink	Packaging and Signage	
Melendrez-Ruiz, Chambaron et al. 2022	Using CATA tests to capture consumers mental representations elicited by images of pulse-based food products	73	France	Food: Pulses	Packaging	
Modi and Singh 2023	Understanding Online Consumer Behavior at E-commerce Portals Using Eye-Gaze Tracking	76	N/A	Website	Advertising	
Najm, Salih et al. 2024	Moderated mediation role of ethnicity on natural skin care products	330	Malaysia	Skin care	Packaging	
Oliver, Vrabich-Brodnjak et al. 2022	Consumer's socio-demographics influence between purchase intention	487	USA	Food products	Packaging	
Oliver, Jestratijevic et al. 2023	Investigation of a Consumer's Purchase Intentions and Behaviors towards Grocery Packaging	487	USA	Food products	Packaging	
Rebollar, Gil et al. 2017	How material, visual and verbal cues on packaging influence consumer expectations and willingness to buy	174	Spain	Potato chip	Packaging	
Shen, Hamm et al. 2021	Assessing consumer buy and pay preferences for labeled food products	740	USA	Food	Label	
Song, Huang et al. 2015	The understanding, attitude and use of nutrition label among consumers	1153	China	Food	Packaging	
Song, Bredahl et al. 2022	Factors affecting consumer choice of novel non-thermally processed fruit and vegetables products	854	Europe	Fruit and vegetables	Packaging	
van Rompay, Fransen et al. 2012	The only way is up location and movement in product packaging	144	Holland	Washing powder	Packaging	
Vergura and Luceri 2018	Product packaging and consumers' emotional response	40	Italy	Biscuits	Packaging	
Wardy, Chonprachaet al. 2017	Influence of Package Visual Cues of Sweeteners	560	N/A	Sweeteners	Packaging	
Yangang 2021	Research on the Influence of Modern Consumer Psychology on Packaging Design	N/A	N/A	N/A	Packaging	
Yu, Droulers et al. 2022	Why display motion on packaging?	63	N/A	Orange juice	Packaging	
		132	N/A	Milk packages	Packaging	

Note: Not Available, N/A.

There were 18 studies [4], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33]. discussing visual design on packaging and the effects of packaging on consumer behavior. At the same time, 13 studies [4], [18], [19], [20], [23], [24], [25], [26], [27], [28], [30], [31], [33] discussed were based on food products. 5 studies [17], [21], [22], [29], [32] discussed were about non-food products.

3.3 The packaging materials and consumer behavior

Three studies [17], [23], [24] emphasized on packaging materials and the impacts of environmentally friendly packaging in the consumer market. According to **Table 2**, it is proven that single people are more

likely to purchase eco-friendly products. Also, research also indicates that young generation, such as GEN Z exhibits higher preference in environmentally friendly packaging options. Thus, environmentally friendly packaging plays an important role in product purchasing.

Table 2. Characteristics of selected studies of the packaging materials and consumer behavior

Studies	Design	Design Attributes	Purpose	Result
Lan, Phuong et al. 2023	Packaging material	N/A	To determine the factors affecting the intention to buy products with environmentally friendly packaging	Environmentally friendly packaging plays an important role in product purchasing
Oliver, Vrabič-Brodnjak et al. 2022	Packaging	Packaging material	To investigate the relationship between purchase intention and purchasing behavior toward environmentally friendly grocery packaging	Single people are more likely to purchase eco-friendly products
Oliver, Jestratijevic et al. 2023	Packaging	Packaging material	To determine whether if consumer attitude toward environmentally friendly grocery packaging has a positive influence	GEN Z exhibits higher preference in environmentally friendly packaging options

3.4 The design elements and consumer behavior

In all, 7 studies [4], [21], [25], [29], [30], [31], [33] mentioned food products as the sample of research. It is shown from previous research that design attributes are also one of the key factors for consumer behavior. Notably, one study, representing 14.3% of the total (1 out of 7)—specifically examined the influence of typeface on consumer expectations related to food choices [4].

Table 3. Characteristics of Selected Studies.

Studies	Design	Design Attributes	Purpose	Result
Kovačević, Mešić et al. 2022	Typeface and Ingredient depiction	Typeface: sans-serif, handwritten Depiction: photo, illustration, without depiction	Typeface design can influence consumer expectations and stimulate their food choices in the case of spices	Typeface influenced the participants' choices and their expectations
Modi and Singh 2023	Advertising	Visual design	To measure where and how the consumer focuses in an advertising brochure, which visual is more striking	Logos and photographs are more effective to affect consumer behavior
Rebollar, Gil et al. 2017	Packaging	Packaging material and photo	To analyze the influence that certain aspects of packaging design have on consumer expectations	The packaging design with pictures can influence consumer behavior



van Rompay, Fransen et al. 2012	Packaging	Visual-spatial design	To study to what extent the location of imagery on product packaging and visual devices portrays movement	The brand is more active when imagery is presented in the top left
Vergura and Luceri 2018	Packaging	Spatial representations (foreground, background)	To investigate different spatial representations	The foreground representation of the product on the packaging shows a more positive emotional response
Wardy, Chonpracha et al. 2017	Packaging	Visual color cues	To study the effects of packet color on sweetener type in the sensory-emotion space	The name/color of sweetener packet elicited more differentiating emotions than sweetener names
Yu, Droulers et al. 2022)	Packaging	Implied motion on packaging	To investigate the influence of implied motion on consumer attention and choice	The result reveals that implied motion is a promising package design technique

3.5 The products and consumer behavior

There are eight studies[18], [19], [20], [22], [32], [26], [27], [28], that related to products and consumer behavior.Two studies[27], [28]focused on the effect of labels on food packaging. As proven from the research,most older people would determine whether or not to purchase a product depending on the text on the product label, and one study[27]stated that consumer choice was mainly driven by benefits related to health, nutrition, and taste.Thus, the result showed that 25% (2 out of 8 studies) specifically investigated the impact of labeling on food packaging. While, one out of 8 reported that consumer choice was primarily influenced by perceived benefits related to health, nutrition, and taste.

Table 4. Characteristics of selected studies.

Studies	Design	Design Attributes	Purpose	Result
Liu, Lyu et al. 2020	Packaging	Image recognition	A study about the cultivation method of consumer marketing brand based on image recognition technology	Analysis of techniques of image monitoring and recognition
McKerchar, Smith et al. 2020	Packaging and Signage	Product packaging and signage	Analyze the children's interactions with food in convenience stores	Most of the kids purchased the non-core food and drinks. However, the packaging and sign have demonstrated the highest effects



Melendrez-Ruiz, Chambaron et al. 2022	Packaging	N/A	to capture the consumers' mental representations	the packaging is a negligible factor in comparison with the nature of the product itself
Najm, Salih et al. 2024	Packaging	N/A	To investigate the factors that affect purchase intention	Packaging design significantly affects the intention to purchase skincare products
Yangang, 2021	Packaging	Color of package design	Applications of color and graphics on package design and consumer psychology towards package design	Product packaging should embody aesthetic function, market value, and packaging design
Shen, Hamm et al. 2021	Label	ProductLabels	to understand how consumers buy and pay preferences for specially labeled products	The older consumer is willing to purchase based on the food labeled
Song, Huang et al. 2015	Packaging	Packaging labels	nutrition to investigate consumer behavior for the use of nutrition label	The nutrition label was mandatory in China to affect consumer behavior in considering health issues
Song, Bredahl et al. 2022	Packaging	N/A	to investigate consumer preferences for the products	Consumer choice was mainly driven by benefits related to health, nutrition, and taste

Note: Not Available, N/A.

IV. DISCUSSION

In this systematic review, we examined the influence of visual design elements on products and their impact on consumer behavior. In the study, we found an evidence that the consumer behavior is affected by the design factor. Clear labeling, thoughtful visual design, and sustainability are potential considerations for product development. Then, the packaging material found as another consideration when purchasing a product. Since, the gradual increase of environmental pollution, and green buying

behavior is becoming more and more popular among the younger generation. It has been proven that consumers are aware of the impact of packaging and what affects it can bring to our environment in the long run. Therefore, we may say that consumers have positive attitude towards the concept of buying environmentally-friendly packaged products.

Our findings highlighted the importance of design factors, design is a critical factor in capturing purchase intentions in the marketplace, particularly for food products. Specifically, we identified that attribute of design such as, shape of packaging, typography, nutritional labeling, color schemes, and product placement on shelves are all significant determinants that may influence consumer behavior and purchasing intentions. We may conclude that other than the factors of packaging material, design elements, and information given on packaging is play an important persuasion for consumers behavior.

According to Table 2, selecting the most suitable packaging material that addresses environmental and waste management concerns, as well as cost considerations, is a crucial aspect of modern packaging. The choice of packaging material depends on several interrelated factors, including the type of food to be packaged, the target market, and the desired shelf-life conditions of the product [34]. As one research mentioned in the table, single people are more likely to purchase eco-friendly packaged products. For example, single-serving packaging meets consumer needs, but bulk packaging is better for environmental reasons (Marsh and Bugusu 2007). Thus, this research discusses the environmental impacts associated with packaging materials and evaluate the possible reactions of consumer behaviors [35]. At the same time, based on the Table 3, design elements and consumer behavior are inseparable. Visual design plays a significant role in a product, a designer needs to pay attention to the use of color and the image design itself. Likewise, positioning of image design on products is also an important consideration for product design. Based on descriptive analysis, it suggests that when a product is placed to the vertical center of a shelf, a product can increase its' sales significantly [36]. It is stated that the brand is more active when imagery is presented in the best position for consumers to see and have access to [37]. Apart from the positioning of a product, specific research also found that implied motion is a promising package design technique to enhance product liking [38]. It's also proven that implied motion influences the expected taste of advertised food through mental simulation [39]. Consumers are more likely to purchase products with implied motion because the visual effect influences the consumer's mental image of the freshness, tastiness, and product attractiveness of products when a consumer decides to make a purchase. For this reason, a visual communication design studies found that it influenced people choices on what they think, they need or they want [40]. In addition, a products with logo designs, photographs etc. are founded to be more effective reason that affected consumer behavior [41]. Apart from image and color, typeface can also influence the participants' choices and their expectations of a product [42]. As a previous study indicates, the key factors that influence consumer behavior can include product visual complexity, the size of the product visual area of a brand, the visual area of price and visual area of nutritional information on food products [43]. Thus, the design attributes play an important role in product purchasing. Future studies, may focused on the design attributes for further analysis regarding the consumer behavior. Previous studies found that there is a significance correlation between consumer behavior and packaging innovations [44].

Additionally, Table 4 depicts the different aspects of packaging and discusses the correlation between consumer behavior and the impact of package design. Both visual components and informational components are equally important in package design [45]. We find that aesthetic packages significantly increase the reaction time of consumers' choice responses [46]. Packaging itself plays an important role in marketing communication, especially in the point of sale and is often treated as the most important factors influencing consumer's purchase decision [47]. We also investigated the behavior of consumers towards food labeling, particularly in relation to nutritional information and health claims. It is evident that a majority of people do focus on the nutritional information on the food labels when deciding to purchase a product [48]. However, we may say that apart from design and material of a product, other



factors including the quality of the product itself and the content list shown on the package label are also important factors that may lead to different choice for consumers when making a purchase.

However, this systematic review has limitations. First, this is a small study, which was used three database and focused in one factor. In future studies, we may add more the databased such as Web of Science and use other factors that can determine consumer behavior instead of only focusing on visual design factors, such as the sensory factors and consumer behavior. The study analyzed the possibilities of the senses which lead to the factors that influenced the intention to purchase a product [49]. Second, the experiments from the research were primarily focused on design factors and the impact on consumer behavior. In further studies, we may use the design factor for durability or effectiveness [50] as a keyword for another related study. Apart from this, other factors may also impact consumer behavior, such as price and branding of a product [51]. As mentioned, the visual appearance of packaging is a crucial realm in modern marketing as well, it cannot be ignored as a key stone in persuading consumers to purchase a product in the market [52]. However, identification of the nature of the product itself and its' influence on consumer behavior need a further analysis [53]. To some extent, future research should provide other insights to identify other possible factors that may influence consumer behavior. Therefore, reconceptualizing other ideas related to this field can identify a wider range of possible relationship towards consumer behavior and product design in general.

V. CONCLUSION

In conclusion, this systematic review highlights the significant influence of design factors on consumer behavior, particularly in the selection of packaging materials, visual design, and product identification. Clear labeling, thoughtful visual design, and sustainability are potential considerations for product development. While packaging can support consumer engagement and marketing strategies, its impact should be understood within the broader context of purchasing behavior. The findings of this study offer valuable design implications for companies, retailers, and designers. This study provides guidelines and identifies key design factors that influence consumer behavior, aiding manufacturers in targeting consumers and creating packaging that enhances purchase intention. Ultimately, effective packaging design can influence advertising strategies and contribute to the success of the product. Further research is needed to clarify these relationships and inform targeted design strategies.

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VII. CONFLICT OF INTEREST

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as potential conflicts of interest.

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REFERENCES

- [1] Deng, X., Consumer response to visual aspects of packaging and product design. 2009, University of Pennsylvania.
- [2] Spence, C. and G. Van Doorn, Visual communication via the design of food and beverage packaging. *Cognitive Research: Principles and Implications*, 2022. 7(1): p. 42.
- [3] Wyrwa, J. and A. Barska, Innovations in the food packaging market: Active packaging. *European Food*



- Research and Technology, 2017. 243: p. 1681-1692.
- [4] Kovačević, D., et al., The influence of packaging visual design on consumer food product choices. *Journal of print and media technology research*, 2022. 11(1): p. 7-18.
 - [5] Fall Diallo, M., et al., Factors influencing consumer behaviour towards store brands: evidence from the French market. *International Journal of Retail & Distribution Management*, 2013. 41(6): p. 422-441.
 - [6] Shrestha, A., et al., Impact of front-of-pack nutrition labelling in consumer understanding and use across socio-economic status: A systematic review. *Appetite*, 2023. 187: p. 106587.
 - [7] Arrazat, L., et al., Traffic-light front-of-pack environmental labelling across food categories triggers more environmentally friendly food choices: a randomised controlled trial in virtual reality supermarket. *International Journal of Behavioral Nutrition and Physical Activity*, 2023. 20(1): p. 7.
 - [8] Loose, S.M. and G. Szolnoki, Market price differentials for food packaging characteristics. *Food Quality and Preference*, 2012. 25(2): p. 171-182.
 - [9] Chitturi, R., J.C. Londoño, and M.C. Henriquez, Visual design elements of product packaging: Implications for consumers' emotions, perceptions of quality, and price. *Color Research & Application*, 2022. 47(3): p. 729-744.
 - [10] de Sousa, M.M., F.M. Carvalho, and R.G. Pereira, Colour and shape of design elements of the packaging labels influence consumer expectations and hedonic judgments of specialty coffee. *Food Quality and Preference*, 2020. 83: p. 103902.
 - [11] Arboleda, A.M. and J.C. Alonso, Design awareness and purchase intention: an item response theory approach. *Academia Revista Latinoamericana de Administración*, 2014. 27(1): p. 138-155.
 - [12] Mirabi, V., H. Akbariyeh, and H. Tahmasebifard, A study of factors affecting on customers purchase intention. *Journal of Multidisciplinary Engineering Science and Technology (JMEST)*, 2015. 2(1).
 - [13] Jisana, T., Consumer behaviour models: an overview. *Sai Om Journal of Commerce & Management*, 2014. 1(5): p. 34-43.
 - [14] Gajjar, N.B., Factors affecting consumer behavior. *International Journal of Research in Humanities and Social Sciences*, 2013. 1(2): p. 10-15.
 - [15] Saura, J.R., et al., Consumer behavior in the digital age. *Journal of spatial and organizational dynamics*, 2020. 8(3): p. 190-196.
 - [16] Page, M.J., et al., The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Bmj*, 2021. 372.
 - [17] Lan, B.T.H., et al., Factors affecting the purchase intention of products with environmentally friendly packaging of urban residents in Ho Chi Minh City, Vietnam. *Sustainability*, 2023. 15(9): p. 7726.
 - [18] Liu, Y., P. Lyu, and W. Gao, Consumer marketing brand cultivation path based on image recognition technology. *IEEE Access*, 2020.
 - [19] McKerchar, C., et al., Food store environment examination–FoodSee: a new method to study the food store environment using wearable cameras. *Global health promotion*, 2020. 27(3): p. 73-81.
 - [20] Melendrez-Ruiz, J., et al., Using CATA tests to capture consumers' mental representations elicited by images of pulse-based food products with different levels of processing. *Appetite*, 2022. 170: p. 105887.
 - [21] Modi, N. and J. Singh, Understanding online consumer behavior at e-commerce portals using eye-gaze tracking. *International Journal of Human–Computer Interaction*, 2023. 39(4): p. 721-742.
 - [22] Najm, A.A., et al., Moderated mediation role of ethnicity on natural skin care products purchasing intention model among multicultural consumers. *Plos one*, 2024. 19(3): p. e0300376.
 - [23] Oliver, M., U. Vrabč-Brodnjak, and I. Jestratić. Consumers' socio-demographics influence between purchase intention and actual behavior of environmentally friendly grocery packaging. in *Proceedings of the 11th International Symposium on Graphic Engineering and Design*, Novi Sad, Serbia. 2022.
 - [24] Oliver, M.O., et al., Investigation of a Consumer's Purchase Intentions and Behaviors towards Environmentally Friendly Grocery Packaging. *Sustainability*, 2023. 15(11): p. 8789.
 - [25] Rebollar, R., et al., How material, visual and verbal cues on packaging influence consumer expectations and



- willingness to buy: The case of crisps (potato chips) in Spain. *Food Research International*, 2017. 99: p. 239-246.
- [26] Shen, Y., et al., Assessing consumer buy and pay preferences for labeled food products with statistical and machine learning methods. *Journal of Food Protection*, 2021. 84(9): p. 1560-1566.
- [27] Song, J., et al., The understanding, attitude and use of nutrition label among consumers (China). *Nutrición hospitalaria*, 2015. 31(6): p. 2703-2710.
- [28] Song, X., et al., Factors affecting consumer choice of novel non-thermally processed fruit and vegetables products: Evidence from a 4-country study in Europe. *Food Research International*, 2022. 153: p. 110975.
- [29] van Rompay, T.J., M.L. Fransen, and B.G. Borgelink. "The only way is up": Location and movement in product packaging as predictors of sensorial impressions and brand identity. in *8th International Conference on Design & Emotion 2012*. 2012. Central Saint Martins & The Design & Emotion society.
- [30] Vergura, D.T. and B. Luceri, Product packaging and consumers' emotional response. Does spatial representation influence product evaluation and choice? *Journal of Consumer Marketing*, 2018. 35(2): p. 218-227.
- [31] Wardy, W., et al., Influence of package visual cues of sweeteners on the sensory-emotional profiles of their products. *Journal of food science*, 2017. 82(2): p. 500-508.
- [32] Yangang, Z. Research on the influence of modern consumer psychology on packaging design based on image analysis. in *Proceedings of the 2021 International Conference on Bioinformatics and Intelligent Computing*. 2021.
- [33] Yu, J., O. Droulers, and S. Lacoste-Badie, Why display motion on packaging? The effect of implied motion on consumer behavior. *Journal of retailing and consumer services*, 2022. 64: p. 102840.
- [34] Marsh, K. and B. Bugusu, Food packaging—roles, materials, and environmental issues. *Journal of food science*, 2007. 72(3): p. R39-R55.
- [35] Varun, A. Sharma, and H. Nautiyal, Environmental impacts of packaging materials. *Environmental Footprints of Packaging*, 2016: p. 115-137.
- [36] Pontigo Marín, S.V., Measuring the impact of shelf position on a retailer's sales. 2021.
- [37] Karadeniz, M. and N. Cdr, Product positioning strategy in marketing management. *Journal of Naval Science and Engineering*, 2009. 5(2): p. 98-110.
- [38] Lidón López, I., et al., Making a big splash: packaging imagery with implied motion enhances product liking through design appeal and naturalness perception. *British Food Journal*, 2024. 126(9): p. 3463-3482.
- [39] Xiong, S., N. Hu, and Y. Ma, The influence of implied motion on expected taste perception of advertised foods: The mental simulation perspective. *Food Quality and Preference*, 2023. 111: p. 104968.
- [40] Baltezarevic, R. and V. Baltezarevic, Impact of visual communication on consumer behavior. *Marketing, business law and transformational governance*, Belgrade: Faculty of Business Economics and Entrepreneurship, 2015: p. 66-79.
- [41] Hou, Y., W. Yang, and Y. Sun, Do pictures help? The effects of pictures and food names on menu evaluations. *International Journal of Hospitality Management*, 2017. 60: p. 94-103.
- [42] Velasco, C. and C. Spence, The role of typeface in packaging design. *Multisensory packaging: Designing new product experiences*, 2019: p. 79-101.
- [43] Mehta, A., et al., Exploring the effects of packaging on consumer experience and purchase behaviour: insights from eye tracking and facial expressions on orange juice. *International Journal of Food Science and Technology*, 2023.
- [44] Mazhar, M., et al., Impact of product packaging on consumers buying behavior: evidence from Karachi. *Journal of Marketing and Consumer Research*, 2015. 16: p. 35-42.
- [45] Ahmad, A.M.K. and Q.M.K. Ahmad, Factors influence on packaging design in an impulse consumer purchasing behavior: a case study of Doritos pack. *International Journal of Marketing Studies*, 2015. 7(6): p. 92-101.
- [46] Reimann, M., et al., Aesthetic package design: A behavioral, neural, and psychological investigation. *Journal of consumer psychology*, 2010. 20(4): p. 431-441.



- [47] Deliya, M.M. and B.J. Parmar, Role of packaging on consumer buying behavior–patan district. *global Journal of management and Business research*, 2012. 12(10): p. 49-67.
- [48] Alibabić, V., et al., Labeling of food products on the B&H market and consumer behavior towards nutrition and health information of the product. *Procedia-Social and Behavioral Sciences*, 2012. 46: p. 973-979.
- [49] Peck, J. and T.L. Childers, Sensory factors and consumer behavior. *Handbook of consumer psychology*, 2008. 4: p. 193-219.
- [50] Mashao, E.T. and N. Sukdeo. Factors that influence consumer behavior in the purchase of durable household products. in *Proceedings of the International Conference on Industrial Engineering and Operations Management*. 2018.
- [51] Devine, D.G. and B.W. Marion, The influence of consumer price information on retail pricing and consumer behavior. *American Journal of Agricultural Economics*, 1979. 61(2): p. 228-237.
- [52] Adam, M.A. and K. Ali, Impact of visual packaging elements of packaged milk on consumers buying behavior. *Interdisciplinary Journal of Contemporary Research in Business*, 2014. 5(11).
- [53] Swaffield, J.B. and J. Sierra Jimenez, Unconscious drivers of consumer behavior: An examination of the effect of nature–nurture interactions on product desire. *Behavioral Sciences*, 2024. 14(9): p. 789.