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Nur Fazlin Fazrina Rashdan dan Zuroni Md Jusoh

Kajian Kualitatif Terhadap Kaedah Perkongsian Untung Kepada Peserta Dalam Takaful
Md Azmi Abu Bakar dan Nuradli Ridzwan Shah Mohd Dali

Cognitive Ergonomics Approach In Food Packaging Design Influence On Purchase Decisions Among Klang Valley Consumers, Malaysia
Irwan Syah Md Yusoff, Azhari Md Hashim and Tai Jia Yi

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COGNITIVE ERGONOMICS APPROACH IN FOOD PACKAGING DESIGN INFLUENCE ON PURCHASE DECISIONS AMONG KLANG VALLEY CONSUMERS, MALAYSIA

(PENDEKATAN ERGONOMIK KOGNITIF DALAM REKA BENTUK PEMBUNGKUSAN MAKANAN DAN PENGARUHNYA TERHADAP KEPUTUSAN PEMBELIAN DI KALANGAN PENGGUNA LEMBAH KLANG, MALAYSIA)

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Abstract

Food packaging plays a multifaceted role in ensuring food safety, convenience, and marketability, and it acts as a silent salesperson, influencing consumer purchasing decisions in a multitude of ways. Nowadays, consumer practices raise significant public health concerns associated with food packaging. Besides, the main objective was to identify the profile of food packaging design on purchase decisions among consumers in Klang Valley at shopping malls by cognitive ergonomic approach. In this research, the variable studied are to identify packaging graphics, color, font style, materials, and information on consumer purchase decisions in Klang Valley at shopping malls. Data was gathered through questionnaires from 270 respondents drawn from five different shopping mall locations in the Klang Valley and chosen through a multistage cluster sampling method. Furthermore, the data was analyzed using descriptive statistics in the form of mean, percentages, standard deviations, and Pearson correlation analysis. The research found a significant positive relationship between packaging graphics, color, font style, materials, and information and consumer purchase decisions. The research concluded that the packaging graphic design is the most significant factor influencing consumer purchase decisions in Klang Valley shopping malls. This research recommends manufacturers implement cognitive ergonomics in food packaging to optimize usability and minimize cognitive workload.

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Keywords: Packaging Design, Purchase Decisions, Cognitive Ergonomics, Consumer

Abstrak

Pembungkusan makanan memainkan peranan yang pelbagai dalam memastikan keselamatan makanan, kemudahan, dan pemasaran, serta bertindak sebagai 'jurujual senyap' yang mempengaruhi keputusan pembelian pengguna dalam pelbagai cara. Pada masa kini, amalan pengguna menimbulkan kebimbangan kesihatan awam yang ketara berkaitan dengan pembungkusan makanan. Selain itu, objektif utama kajian ini adalah untuk mengenal pasti profil reka bentuk pembungkusan makanan terhadap keputusan pembelian dalam kalangan pengguna di Lembah Klang di pusat membeli-belah melalui pendekatan ergonomik kognitif. Dalam kajian ini, pemboleh ubah yang dikaji adalah untuk mengenal pasti grafik pembungkusan, warna, gaya fon, bahan, dan maklumat yang mempengaruhi keputusan pembelian pengguna di Lembah Klang di pusat membeli-belah. Data telah dikumpul melalui soal selidik daripada 270 responden yang diambil dari lima lokasi pusat membeli-belah yang berbeza di Lembah Klang dan dipilih melalui kaedah pensampelan kluster berperingkat. Tambahan lagi, data tersebut dianalisis menggunakan statistik deskriptif dalam bentuk min, peratusan, dan sisihan piawai, serta analisis korelasi Pearson. Kajian mendapati terdapat hubungan positif yang signifikan antara grafik pembungkusan, warna, gaya fon, bahan, dan maklumat dengan keputusan pembelian pengguna. Kajian ini merumuskan bahawa reka bentuk grafik pembungkusan adalah faktor paling penting yang mempengaruhi keputusan pembelian pengguna di pusat membeli-belah Lembah Klang. Kajian ini mencadangkan agar pengeluar melaksanakan ergonomik kognitif dalam pembungkusan makanan untuk mengoptimumkan kebolehgunaan dan mengurangkan beban kognitif.

Kata Kunci: *Rekabentuk Pembungkusan, Keputusan Pembelian, Ergonomik Kognitif, Pengguna*

Introduction

Packaging can be categorized according to its specific product, such as medicine, beverage, food, or other commodities. Das et al. (2018) conducted a study highlighting the crucial role of packaging in pharmaceutical products. Pharmaceutical solids, liquids, and gases are available in several packaging forms, but the most used options are blister packs and bottles. The administration, measurement, and utilization of the pharmaceutical drug occasionally necessitate packaging, and guidelines also govern the dissemination of usage instructions and cautionary labels. Conversely, the assortment of packaging choices, such as aseptic packets, enables beverages to maintain their nutritional content, authentic flavor, hue, and texture over

an extended period without further preservatives. Food packaging is a specialized system designed to safeguard food products from chemical, biological, and physical alterations, making it an essential step in food processing (Marsh & Bugusu, 2007).

According to Robertson (2014), food packaging is essential in today's food market, and almost all items are sold with packaging. Food packaging is a vital element of the food processing industry. Its purpose is to contain, protect, and preserve the finished product to meet consumer demands (Ahmed et al., 2022). Food processing safety is contingent upon the presence of packaging. Hence, packaging is a crucial means of conveying information that significantly influences consumers' perceptions of items and purchasing choices (Ahmed et al., 2022). Under certain conditions, the packaging materials take precedence in food, as certain items require the ability to withstand microwave heat—for example, ready-to-heat meals and microwaveable popcorn (Muncke, 2016). Aseptic packaging, cans, bags, flexible packaging, boxes, and other forms of packaging each have specific functions, just as the food products they contain. The packaging design can vary greatly depending on these factors.

The phrase "packaging elements" encompasses a package's visual and structural components and all its printed information (Şener et al., 2015). In addition, the wide range of choices available in grocery shops has resulted in a scenario where customers must choose the optimal product based on factors such as attractive, informative, or high-quality packaging design (Pentus et al., 2014). The authors Bošnjaković et al. (2022), Chind and Sahachaisaeree (2012), and Wang and Chou (2011) emphasized the importance of packaging in attracting consumers' attention and conveying the product's message. Consumers rely on packaging attributes to make informed decisions when selecting a product from various available options (Wang & Chou, 2011; Chind & Sahachaisaeree, 2012; Bošnjaković et al., 2022). Hence, product packaging plays a crucial role in a product's overall composition and significantly impacts consumers' perceptions and emotions toward the product. The packaging can attract and convince potential customers.

According to Chind & Sahachaisaeree (2012), a crucial tactic for convincing consumers to purchase a product is to convey its value and dependability through the visual presentation of its packaging. Shapes and colors possess associations that impact consumers' assessment of a product's quality (Pires Gonçalves, 2008). The components of color, typography, graphical forms, and image are vital elements of a positioning strategy, as they influence how consumers perceive the product's position (Ampuero & Vila, 2006).

Furthermore, various factors or conditions influence customer behavior. These qualities encompass cultural, social, psychological, and personal aspects. External factors such as demographics, economics, social influences, situational factors, and technological factors impact consumer behavior. Various internal factors have a role,

such as personality, perception, learning, objectives, needs, and values. Wu (2003) utilized four categories, including consumer demographics, consumer buying preferences, consumer benefit perception, and consumer lifestyle, to categorize the study and integrate the factors that affect attitudes and determine the attributes of the consumer. Consumer demographics encompass various external factors influencing consumer behavior, such as gender, age, occupation, education, income, interests, and place of residence. Consumer purchase motives and preferences are intrinsic characteristics encompassed under consumer purchase preferences. Consumer benefit perceptions encompass the aggregate of advantages or gratifications linked to online shopping that fulfill an individual's needs or desires. An individual's consumption lifestyle encompasses their chosen manner of living.

According to Coulson (2000), as consumers become more concerned about nutrition and health, they increasingly focus on the information provided on product labels. These clients exhibit a higher frequency of utilizing package information and demonstrate greater engagement in purchasing. Devoting such a substantial amount of time to a single product is excessive, especially considering the abundance of choices. Unclear packaging labeling hinders consumers' ability to differentiate between identical products. However, customers choose their product choices primarily based on flavor and package size, which may not necessarily align with their valid preferences. Hence, including printed information or product labels on food packaging makes it more convenient for consumers to compare the ingredients, such as printed information about health-related products.

Moreover, Bošnjaković et al. (2022) emphasize the significance of packaging in everyday existence and its ability to impact individuals' quality of life. When creating packaging, it is crucial to consider fundamental human attributes, including physical and mental capacities, personality and emotional state, and cognitive functions. Disregarding these considerations can lead to expensive design implications regarding financial cost, consumer performance, and pain. Inadequately crafted packaging can lead to product waste and leaks or, in more severe cases, cause physical injuries. Subsequently, one must allocate time and effort to address the adverse repercussions and the financial burden of repurchasing the item. Hence, including cognitive ergonomics in packaging design is crucial while designing product packaging.

According to Kim (2016), cognitive ergonomics is used in real-life situations to clarify the attributes of human abilities and constraints in processing information. Cognitive ergonomics applies knowledge from the cognitive sciences to analyze and enhance the interactions between humans and systems. It focuses on researching mental processes such as perception, attention, memory, decision-making, and learning (Kim, 2016). In addition, cognitive ergonomics involves several essential factors like attention, information processing, sensation, perception, affordances, and the

prediction of human errors. The elements substantially impact our decision-making process when choosing and using a product.

Additionally, they can provide valuable guidance for enhancing the design of packaging (Theobald and Winder, 2006). In the realm of sensation and perception, sensation refers to the immediate and direct response of our sensory receptors, which are situated in our ears, eyes, nose, tongue, and skin (Bošnjaković et al., 2022). Sensation is the first stage in retrieving information from the outside world. Higher-level cognitive processes start working as soon as we acquire information from any of these senses and “perceive” that information (Theobald and Winder, 2006). For attention and processing information, Bošnjaković et al. (2022) stated that when it comes to differentiating a product's packaging from that of competitors' products, attention is crucial for processing a large amount of information and selecting information that is of interest. Everyone is aware that significant competition in the target market can be created by effective design (Theobald and Winder, 2006; Pathak, 2014; Bošnjaković et al., 2022). Perceptual affordances can also be classified as true or false; true affordances encompass the tactile qualities, form, hues, and other attributes of the package that offer indications for effortless access to the packing if adhered to. Affordances encompass the tactile qualities, form, hues, and more attributes of the package that offer indications for effortless access to the packing if adhered to (Bošnjaković et al., 2022). When analyzing consumer behavior, cognitive difficulties are likely to play a role in package opening mistakes, resulting in human error (Bošnjaković et al., 2022).

Cognitive ergonomics aims to optimize human information processing, increase productivity, minimize errors and accidents, and improve general well-being by developing and modifying cognitive tools and their applications (Haan, 2000; Chen et al., 2022). Furthermore, a psychological perspective is utilized to examine the relationship between the attributes of a product and the feelings encountered by its users (Nagamachi, 1995; Chen et al., 2022). Bošnjaković et al. (2022) conducted a study demonstrating that integrating cognitive ergonomics into container design makes it feasible to attract consumers' attention and ultimately impact their buying choices. Cognitive ergonomics aims to ensure that a product's design and functionality are in harmony with the cognitive abilities of its users, achieved through the implementation of appropriate visual signals. This allows for the packaging to be used sustainably and effectively. The cognitive ergonomics of packaging aid the intended audience in differentiation.

Methodology

The studies were conducted at the shopping malls in Klang Valley, Selangor, Malaysia. Klang Valley, also known as Lembah Klang in Malay, is an area of cities and towns in Selangor, mainly in Kuala Lumpur and Putrajaya, Malaysia's federal

territory. Geographically, the Titiwangsa Mountains to the north and east and the Strait of Malacca to the west separate the Klang Valley from the rest of Malaysia. It extends to Klang and Port Klang in the southwest, Rawang in the northwest, and Semenyih in the southeast. Malaysia's industries and commerce are centered in the conurbation. The Klang Valley region is divided into five sections: the Federal Territory of Kuala Lumpur (FT Kuala Lumpur), Gombak, Petaling, Klang, and Hulu Langat.

Sampling research is another study technique that randomly picks samples from the population and infers the features of the population using sample data. Probability sampling and non-probability sampling are the two main divisions in sampling research. Multistage cluster sampling can be a complex kind of cluster sampling because it is a variation in sampling that includes dividing the population into groups (or clusters). In multistage cluster sampling, the population is divided into clusters, and some clusters are chosen in the first stage. At each successive stage, researchers divide those selected clusters even further into smaller clusters and continue the procedure until they reach the last phase. In the final stage, researchers only select a subset of each cluster for the sample. The advantage of multistage cluster sampling is that it is usually more accurate than cluster sampling for the same sample size. Another advantage is researchers can simplify data gathering by obtaining a probability sample without a complete sampling frame when researchers have large, geographically dispersed samples.

The study divides the sample into clusters (14 areas) in the first stage. It randomly selects 5 clusters (5 areas: Petaling Jaya, Subang Jaya, Shah Alam, Cheras, and Seri Kembangan) to use as the researcher sample in the second stage and chooses two shopping malls for their study from every cluster (each area) in the final stage. Within the Klang Valley's fourteen areas, the researcher randomly chose five, with each location choosing two shopping malls to complete the questionnaire. The sample size must be sufficient for internal generalization without bias or error (Taherdoost, 2016). For the formulas of the theory of Krejcie and Morgan, the researcher obtained 270 respondents to survey in this study.

Questionnaires and interviews are two of the most common data collection methods in survey research. However, only the questionnaire was employed in this study. A questionnaire is the most prevalent method of obtaining primary quantitative data (Roopa and Rani, 2012). An open-ended and closed-ended questionnaire was used to collect data in this study. Data was collected using questionnaire papers distributed to consumers at malls in the Klang Valley. The closed-ended questionnaire contained a five-point Likert scale to indicate how strongly respondents agreed or disagreed with each subject. A Likert scale is an ordered scale from which respondents can select the option most closely matches their viewpoint. Therefore, a Likert scale is suitable for evaluating the respondents' views by asking the extent to which they

agree or disagree with a particular statement. The questionnaire has a mix of closed-ended, open-ended questions, and scale questions. Part A of the questionnaire featured two open-ended questions and eight closed-ended questions. The two open-ended questions involved age and monthly income (self/parents), while the eight closed-ended questions were designed to identify the demographics of the respondents, which included gender, race, employment, marital status, family size, residential area, area of shopping malls visited, and shopping malls visited. In addition, part B is the profile of food packaging and consumers' purchase decisions on the market, which uses the closed-ended questions method. It included eight questions and directed respondents to specific points, potentially revealing clear trends. Moreover, 5 or 6 questions are in each of the questionnaire's parts: C, D, E, F, G, and H. The questions in this section were graded on a five-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (5).

Result and Discussion

Demographic Information of Respondents

The sample was distributed to 270 respondents, with the majority being between the ages of 18 and 24 (20.4%), followed by 25 to 54 (65.8%), 55 to 64 (7.4%), and 65 and above (3.7%). For gender, 46.3% of respondents are male, and 53.7% are female. According to research by Katrodia et al. (2018), females spend more time on average than males, and this impacts how much money they spend on average at malls. Malay (44.4%) is the most common race among the 270 respondents, followed by Chinese (40.4%), Indian (11.5%), and Iban (3.7%). Moreover, most respondents were married (52.2%), followed by single and divorced (41.9% and 5.9%). In addition, respondents from rural areas (50.4%) were greater than those from urban areas (49.6%) in terms of residence area. Respondents with a monthly income of RM0 to RM4849 (90.0%), which represents the bottom 40% of household income (B40), are higher than respondents with a monthly income of RM4850 – RM10959 (10.0%), which represents the middle 40% of household incomes (M40). As Ibhrim et al. (2022) mentioned, COVID-19 is spreading among many low-income B40 household groupings, particularly in the Klang Valley. As per the Department of Statistics Malaysia (2020), about 600,000 homes belonging to the M40 group have been classified as B40 (cited in "How Is The COVID-19 Pandemic Affecting Malaysian Household Income?", 2021). In addition, the areas of shopping malls and shopping malls that respondents currently visit were chosen equally, with 20% of each area and 10% each shopping mall, as shown in Table 1.

Table 1: Demographic Information

Characteristics	Frequency	Percentage (%)
Age		
18 – 24	55	20.4
25 – 54	185	65.8
55 – 64	20	7.4
65 and above	10	3.7
Gender		
Male	125	46.3
Female	145	53.7
Race		
Malay	120	44.4
Chinese	109	40.4
Indian	31	11.5
Other	10	3.7
Marital Status		
Single	113	41.9
Married	141	52.2
Divorced	16	5.9
Residential area		
Urban	134	49.6
Rural	136	50.4
Monthly Income		
RM0 – RM4849	243	90.0
RM4850 – RM10959	27	10.0
Area of Shopping Malls		
Petaling Jaya	54	20.0
Subang Jaya	54	20.0
Shah Alam	54	20.0
Cheras	54	20.0
Seri Kembangan	54	20.0

N:270

Profile of Food Packaging and The Purchase Decision of Consumers in The Market

According to the findings (Table 2), 80.4% of respondents visited shopping malls at least three times weekly, compared to 19.6% who did not. This aligns with Hameli (2017), where most respondents frequented shopping malls two to three times weekly. The ease of holding will influence 46.3% of respondents, while 53.7% of respondents will not be influenced. Besides, 82.6% of respondents stated they would be differing

responses to different color packaging, compared to 17.4% who did not. This is supported by Labrecque, Patrick, and Milne (2013) regarding marketers have traditionally used color as a visual mnemonic device to promote cognition and thought as well as capture consumers' attention since colors have a dramatic and profound effect on consumers' thoughts, feelings, and behaviors (cited in Mohebbi, 2014). 75.2% of respondents indicated they recognize and comprehend the halal logo, compared to 24.8% who indicated they do not.

Furthermore, 62.2% of respondents will be influenced by easy-to-hold food packaging, while 37.8% of respondents will not be influenced. In addition, 78.5% of respondents reported experiencing mistakes when not reading food packaging details, whereas 21.5% did not. 77.8% of respondents paid more attention to attractive food packaging design images than the 22.2% who did not. Moreover, 84.1% of respondents checked the quality of food packaging before buying, in contrast to the 15.9% who did not. This aligns with Hanslim et al. (2020) regarding increased consumer focus on product quality before purchasing.

Table 2: Profile of Food Packaging Design and The Purchase Decision of Consumers in The Market


Statements	Frequency	Percentage (%)
Do you go to shopping malls at least 3 times a week? Yes No	217 53	80.4 19.6
Does easy-to-hold food packaging influence you to buy? Yes No	125 145	46.3 53.7
Do you have different feeling from different colour packaging? Yes No	223 47	82.6 17.4
Is this a halal logo?  Yes No	203 67	75.2 24.8

Table 2 (continues)

Statements	Frequency	Percentage (%)
Does easy-to-open food packaging influence you to buy? Yes No	168 102	62.2 37.8
Do you experience mistakes when you do not read the details on food packaging? Yes No	212 58	78.5 21.5
Do you pay attention to attractive food packaging design images? Yes No	210 60	77.8 22.2
Have you checked the quality of food packaging? Yes No	227 43	84.1 15.9
Does easy-to-open food packaging influence you to buy? Yes No	168 102	62.2 37.8

N:270
Packaging Graphic

The statement “The picture of the product packaging that reflects the fact that it is high quality influences my purchase decision” has the highest mean, which is 4.31, and the highest standard deviation, which is 0.98. Respondents mostly feel that attractive packaging acts as a visual cue that creates favorable associations with the product, persuading them that it is superior to rivals without forcing them to spend time and energy doing a thorough analysis. Conversely, the statement “The picture quality of the product packaging influences my purchase decision” was recorded at 4.18 of the lowest mean and 0.91 of the lowest standard deviation. This indicates that respondents place a higher value on the product and its features than purely aesthetic features like image quality. Even a low-quality photograph of luxurious packaging may convince them; nevertheless, a high-quality image of poor packaging might not.

Table 3 shows that the mean are consistently close to 4 (agree). The mean score and mean standard deviation of the packaging graphic are 4.25 and 0.95, respectively.

Amlus (2014) indicated that the mean score range of 3.68 to 5.00 is regarded as high. Therefore, the mean level result is regarded as high within the mean score range.

Table 3: Packaging Graphic

Statements	Mean	SD (+/-)
The picture quality of the product packaging influences my purchase decision.	4.18	0.91
The appetizing standard of the picture quality of the product influences my purchase decision.	4.20	0.97
The picture of the product packaging that reflects the fact that it is high quality influences my purchase decision.	4.31	0.98
The graphics used on the package draw me to reading what it communicates.	4.27	0.95
The brand image on the package has an impact on consumer behavior on buying process.	4.29	0.95
Mean score and Mean S.D.	4.25	0.95

1= strongly disagree to 5= strongly agree
 N:270

Packaging Colour

The statement “I think that focus is done while offering the commodity on the color of the package to attract your attention” has the highest mean, which is 4.29. It means that respondents are more likely to notice and respond to products that are packaged in eye-catching colors. This is because color is one of the most salient visual features, and it can effectively grab attention. On the other hand, the lowest mean is for the statement, “The color combination that can easily be remembered influences my purchase decision”, which is recorded at 4.17. It means that, for most respondents, individual colors are easier to remember than complicated mixtures. This is because it might be difficult for humans to remember color combinations.

Besides, the statements “I have full readiness to buy commodities with attractive colors even if they cost a little higher than the traditional color goods” have the highest standard deviation, which is 1.04, and the statement with the lowest standard deviation is “The color combination that makes the product stand out among other competitive products influences my purchase decision” which is 0.97. Table 4 shows that the mean are consistently close to 4 (agree). The mean score and mean

standard deviation of packaging color are 4.21 and 1.00, respectively. According to Amlus (2014), the mean score range of 3.68 to 5.00 is considered high. Therefore, the result of the mean level is considered high within the mean score range.

Table 4: Packaging Colour

Statements	Mean	SD (+/-)
The colour of food packaging influences my purchase decision.	4.19	0.99
The colour combination that can easily be remembered influences my purchase decision.	4.17	0.98
The colour combination that makes the product stand out among other competitive products influences my purchase decision.	4.18	0.97
I have full readiness to buy commodities with the attractive colours even if they cost little higher than the traditional colour goods.	4.21	1.04
I think that the focus is done while offering the commodity on the colour of the package to attract your attention.	4.29	1.01
Mean score and Mean S.D.	4.21	1.00

1= strongly disagree to 5= strongly agree
N:270

Packaging Font Style

The statement “The font size used helps me remember this product/brand” has the highest mean, 3.70. The respondents believed that font style might significantly impact brand recall because a more uncommon font style can be more visually striking and, therefore, more likely to catch consumers’ attention and enhance memorability. Conversely, the lowest mean is for the statement, “The font used on food products that attract my attention from a distance influences my purchase decision,” which was recorded at 3.52. It reveals that most respondents believe that visual salience has a limited effect at a distance; as a result, other visual components like branding, color, and packaging design frequently have a more significant impact on drawing attention than particular font selections at a distance.

Besides, the statements “The font used on food products that attract my attention from a distance influences my purchase decision” and “I like the creative font style on

packets of this product/brand” have the highest standard deviation, which is 1.39, and the statement with the lowest standard deviation is “The font used in writing ingredient composition of food products that is legible and could be easily interpreted by customers influences my purchase decision” which is 1.25. Table 5 illustrates that the mean are consistently close to 3 (neutral). The mean score and mean consistently standard deviation of the packaging font style are 3.61 and 1.36, respectively. Amlus (2014) indicated that the mean score range of 2.34 to 3.67 is medium. Therefore, the overall result of the mean level is regarded as medium within the mean score range.

Table 5: Packaging Font Style

Statements	Mean	SD (+/-)
The font used in writing ingredient composition of food products that is legible and could be easily interpreted by customers influences my purchase decision.	3.66	1.25
The font used on food products that attract my attention from distance influences my purchase decision.	3.52	1.39
The font used on the food product packaging is legible and can be understood by customers influences purchase decision.	3.64	1.37
I like the creative font style on packets of this product/brand.	3.53	1.39
Font size used helps me remember this product/brand.	3.70	1.38
Mean score and Mean S.D.	3.61	1.36

1= strongly disagree to 5= strongly agree
 N:270

Packaging Materials

The statement “My purchase decision depends on the attractive packaging materials” has the highest mean, 4.39. This proves that packaging can appeal to the senses of sight, touch, and even smell. This multisensory experience can create a more positive and memorable impression of the product, influencing my purchase decisions. On the other hand, the lowest mean is for the statement “Material quality of food product packaging influences my purchase decision,” which is recorded at 4.23, and the lowest standard deviation is 0.87. This implies that pricing may be the main deciding factor for certain customers, particularly those with limited funds or price-sensitive

consumers. If the product is supplied at a cheaper price point, they could be willing to ignore issues about the quality of the materials.

Besides, the statement “Ability to recycle food products packaging influences my purchase decision” has the highest standard deviation, 0.95. Table 6 displays the mean are consistently 4 (agree). Packaging materials’ mean score and mean standard deviation are 4.31 and 0.92, respectively. According to Amlus (2014), the mean score range of 3.68 to 5.00 is considered high. Therefore, the result of the mean level is considered high within the mean score range.

Table 6: Packaging Materials

Statements	Mean	SD (+/-)
Material quality of food product packaging influences my purchase decision.	4.23	0.87
Versatility of food product packaging (i.e. can reuse the package) influences my purchase decision.	4.30	0.91
Draws your attention to the product the cover made of biodegradable materials in the environment quickly.	4.30	0.94
The ability to recycle food products packaging influences my purchase decision.	4.33	0.95
My purchase decision is depends on the attractive packaging materials.	4.39	0.91
Mean score and Mean S.D.	4.31	0.92

1= strongly disagree to 5= strongly agree
N:270

Packaging Information

The statement “Read information on package before purchasing food product” has the highest mean, 4.47. This shows that people are becoming more concerned about food safety and health. They actively ensure that the food they purchase is safe to consume and satisfies their dietary requirements by reading the information on the packaging. Conversely, the lowest mean is for the statement “Food product packaging labels influence my purchase decision,” which was recorded at 4.29. It means that some respondents are overwhelmed with marketing messages; they become fatigued and skeptical of package information.

Besides, the statement “Reading food products information helps in quality judgment” has the highest standard deviation, which is 0.84, and the statement with the lowest standard deviation is “Visual information on the packaging of food items influences purchase,” “Prefer food products which mention the nutritional information,” and “Complicated labels of food products do not influence purchase decision” which is 0.81. Table 7 shows the mean are consistently close to 4 (agree) value. The mean score and mean standard deviation of packaging information are 4.40 and 0.82, respectively. Amlus (2014) indicated that the mean score range of 3.68 to 5.00 is regarded as high. Therefore, the result of the mean level is regarded as high within the mean score range.

Table 7: Packaging Information

Statements	Mean	SD (+/-)
Food product packaging labels influence my purchase decision.	4.29	0.82
Visual information on packaging of food items influences purchase.	4.39	0.81
Reading food products information helps in quality judgment.	4.41	0.84
Prefer food products which mention the nutritional information.	4.44	0.81
Complicated labels of food products do not influence purchase decision.	4.40	0.81
Read information on package before purchasing food product.	4.47	0.83
Mean score and Mean S.D.	4.40	0.82

1= strongly disagree to 5= strongly agree

N:270

Consumer Purchase Decision

The statement “I will likely buy this product/ brand” has the highest mean, 4.46. It implies that when respondents have a more positive view of a product, they will likely engage in positive behavior (such as buying something). On the other hand, the lowest mean is for the statement, “My society culture influences my purchasing decision,” which is recorded at 4.28. Respondents may not impact my purchasing

decision based on societal culture for goods viewed as universal or less culturally specific, such as basic amenities.

Besides, “I think of buying this product/brand” has the highest standard deviation, which is 0.85, and the statement with the lowest standard deviation, “My lifestyle culture helps me shape my attitudes towards packaging, which is 0.71. Table 4.9 illustrates Table 8 shows that the mean for these five statements are consistently close to 4 (agree). The mean score and mean standard deviation of consumer purchase decisions are 4.36 and 0.78, respectively. According to Amlus (2014), the mean score range of 3.68 to 5.00 is considered high. Therefore, the result of the mean level is considered high within the mean score range.

Table 8: Consumer Purchase Decision

Statements	Mean	SD (+/-)
My lifestyle culture helps me to shape my attitudes towards packaging.	4.34	0.71
My society culture influences my purchasing decision.	4.28	0.80
My family culture helps me to shape my attitudes towards packaging.	4.34	0.73
I think of buying this product/brand.	4.36	0.85
It is very likely that I will buy this product/ brand.	4.46	0.79
Mean score and Mean S.D.	4.36	0.78

1= strongly disagree to 5= strongly agree
 N:270

The most significant influence on purchase decisions on food packaging among consumers in Klang Valley shopping malls

Table 9 provides an R-value of 0.428, indicating that 42.8% of the correlations between the dependent variable (consumer purchase decision) and the independent variables (packaging graphic, packaging color, packaging font style, packaging materials, and packaging information) are present. This indicates a moderately positive correlation between the packaging features and consumer purchase decisions. In simpler terms, changes in packaging features are associated with changes in purchase decisions, but the strength of this association is moderate.

In addition, as indicated by the R-square value, 18.4% of the variation was explained. This means that only 18.4% of the variation in purchase decisions can be explained by the packaging features considered in the study. This also clarifies that while the features relate to purchase decisions, their direct influence is relatively small. However, in this study, the remaining 81.6% remained unexplained. This highlights the significant gap in understanding what drives consumer choices beyond the considered packaging factors.

Moreover, this percentage is explained by other variables not discussed in this research. Based on the other study, Alhamdi (2020) discussed that the dependent variable (attracting consumer attention to commodities) can be explained by the packaging designs, packaging size, packaging shape, and packaging color to the extent that the R-square coefficient equals 0.47. This suggests that other factors, such as packaging shape, packaging size, and packaging design, which are not included in the research, play a more significant role in influencing consumers' attention. Therefore, in this study, the packaging features studied have a limited influence on purchase decisions.

Table 9: Model Summary (Consumer Purchase Decision)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.428 ^a	0.184	0.168	2.63407

a. Predictors: (Constant), Packaging Information, Packaging Materials, Packaging Graphic, Packaging Font Style, Packaging Colour

This study uses standardized beta coefficients to evaluate the most significant variables influencing consumer purchase decisions. As shown in Table 10, the standardized beta coefficients for packaging graphics are 0.240, packaging colors are 0.227, packaging font style is 0.055, packaging materials are 0.121, and packaging information is 0.092. Meanwhile, the results suggest that packaging graphics are the most significant variable influencing customer buying decisions. Thus, the greater the value of the standardized beta coefficient, the greater the influence of the independent variable on the dependent variables. This statement is demonstrated by Wang et al. (2023), who stated that packaging graphics were the most crucial factor and had the most significant influence on consumers' purchase decisions. Thus, this study, which is packaging graphics, has the most significant influence on purchase decisions on food packaging among consumers in Klang Valley shopping malls.

Table 10: Multiple Linear Regression (Consumer Purchase Decision)

Variables	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	10.778	1.598		6.745	0.000
Packaging Graphic	0.169	0.040	0.240	4.208	0.000
Packaging Colour	0.154	0.039	0.227	3.952	0.000
Packaging Font Style	0.025	0.026	0.055	0.972	0.332
Packaging Materials	0.092	0.043	0.121	2.153	0.032
Packaging Information	0.067	0.041	0.092	1.610	0.109

a. Dependent Variable: Consumer Purchase Decision

Conclusion and Recommendation

In the descriptive analysis, the three highest values in the profile statements are “Do you go to shopping malls at least three times a week?” (80.4%), “Do you have different feelings from different color packaging?” (82.6%), and “Have you checked the quality of food packaging?” (84.1%). The overall mean score obtained from the descriptive analysis will be divided into three groups: low, medium, and high. The findings indicate that consumers make high purchase decisions in Klang Valley shopping malls regarding packaging graphics, color, materials, and information. This is because the overall mean score of the customers' purchase decisions falls within the high-level range of 3.68 to 5.00 (Amlus, 2015). In contrast, the result shows that the consumer purchase decision in Klang Valley shopping malls towards packaging font style was medium, which plays a less influential role because the mean score of the consumer purchase decision is between 2.34 and 3.67.

The ergonomic cognitive approach contributes to understanding food packaging by guiding packaging design and informing consumer behavior. For instance, usability and convenience are two approaches that emphasize user-centered design, ensuring packaging is easy to handle, open, and reseal. This can improve brand image because ergonomic packaging demonstrates thoughtfulness and care for the consumer, enhancing brand perception. In addition, information clarity and transparency are the approaches that encourage clear and accessible labeling, ensuring consumers can easily understand ingredients, nutritional facts, and

sustainability claims. This means consumers can make choices based on their needs and preferences. The other way to guide packaging design is through emotional connection and brand differentiation. This approach recognizes the role of emotions in purchase decisions, encouraging packaging design that evokes positive feelings and aligns with brand values.

Consumers are bombarded with packaging daily, and the ergonomic cognitive approach helps them decipher the subtle cues embedded within. For example, a sleek, minimalist design with a straightforward sans-serif font might signal a healthy, premium product. At the same time, a bold, colorful package with playful graphics might suggest a fun, family-oriented snack. According to Gil-Pérez et al. (2019), a given image might have multiple interpretations. For example, an image like "fire" on a food package could evoke multiple connotations, such as spiciness or barbecue flavor, so producers and designers must comprehend what influences consumers to interpret an image in a particular way. Therefore, understanding these design cues allows consumers to quickly assess whether a product aligns with their needs and preferences, saving them time and reducing mental effort during decision-making, ultimately leading to more informed choices.

This study provides impactful insights for governments to take action to improve or enhance food packaging and assists consumers in becoming more aware of food packaging. Governments have the authority to impose laws prohibiting visual signals or symbols on packaging to draw attention to unhealthy substances or items with high sugar or fat content. Governments have the authority to promote or enforce the use of environmentally friendly packaging materials and designs that take composting and recycling into account. Therefore, government involvement in applying cognitive ergonomics to food packaging has the potential to significantly influence consumer purchase decisions toward healthier and more sustainable choices.

This study also advocates for implementing cognitive ergonomics in food packaging. Manufacturers can design food packaging that is not only user-friendly and accessible but also influences purchase decisions by appealing to consumers' emotions, values, and informational needs. Therefore, effective packaging design is essential for increasing consumer trust and brand loyalty.

Moreover, the researchers can broaden the scope of their study and explore specific topics deeper. Future study attempts may uncover subjects like how food packaging affects consumers' online purchasing behavior. This is because social media and the growing trend of online shopping can influence consumer behavior and provide a platform for further research on the impact of food packaging elements on online buying behavior.

In addition, other variables for future research should be determined. In this research, the researcher used only five factors to study the factors influencing consumers' purchase decisions related to food packaging. However, there was only an 18.4% of the variance in Klang Valley shopping mall consumers' food packaging-related purchasing behavior. As a result, future research must expand the scope of researched variables to obtain more accurate and reliable results, as various factors might affect consumers' purchasing decisions.

According to this study, manufacturers underscore the critical role of making their packaging meaningful and personally relevant to boost consumer motivation and buying decisions. Besides, manufacturers can understand the kinds of food packaging that consumers will find most appealing, influencing their purchase intention and brand attitude. This is because food packaging has grown to be an essential factor in customers' decision-making processes; the attractiveness of container design encourages consumers to consider marketing messaging.

Based on these studies, increased consumer awareness of packaging and its impact on decision-making. The research can educate consumers about the subtle ways packaging design manipulates their decision-making, empowering them to make more informed choices. Consumers can improve packaging for healthier decisions. For instance, understanding how packaging influences cognitive processes can guide the design of packaging that promotes healthier food choices, combating issues like obesity and unhealthy snacking. Consumers can democratize access to food information. Packaging designed with cognitive ergonomics in mind can provide more transparent and accessible information about nutritional content and ingredients, empowering consumers with knowledge. Thus, consumer understanding of how packaging design influences their cognitive processes empowers them to make more conscious purchasing decisions.

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