

DECODING CONSUMER PREFERENCES IN FOOD PACKAGING WITH THE KANO MODEL

doi: 10.2478/czoto-2023-0010

Date of submission of the article to the Editor: 17/11/2023

Date of acceptance of the article by the Editor: 04/12/2023

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Abstract: This study investigates the efficacy of the Kano Model in decoding consumer preferences for food packaging. Recognizing the pivotal role of packaging in product satisfaction and purchase decisions, this research integrates the Kano Model with contemporary market analysis. A survey was conducted with a diverse panel of consumers who rated various packaging features of existing food products. The results were analyzed to determine the impact of these features on consumer satisfaction and their potential to elevate the perceived value of the products. The study uncovered that while basic safety and hygiene factors were deemed essential, innovative elements such as eco-friendly materials and interactive labels significantly enhanced customer delight. The practical implications of this research are profound, providing food manufacturers with a nuanced understanding of how to prioritize packaging features to align with consumer desires, thereby fostering brand loyalty and competitive advantage. The Kano Model's application in this context demonstrates its versatility and potential for adaptation in the dynamic field of food packaging.

Keywords: Kano Model, Consumer Preferences, Food Packaging, Market Analysis, Product Satisfaction.

1. INTRODUCTION

In the fiercely competitive food industry, packaging is not just a means of preservation and protection. It is a silent salesman, a communicator of brand value, and a significant factor influencing consumer buying behavior (Dash, 2021; Guimarães, et al., 2022). As brands navigate an ever-more crowded market, the discernment of consumer predilections regarding packaging innovations becomes indispensable for differentiation and cultivating brand allegiance (Ulewicz, 2018; Siwiec et al., 2022; Grebski et al., 2022). The Kano Model, developed by Noriaki Kano in the 1980s, offers a sophisticated approach to categorizing customer preferences into distinct levels of satisfaction, from basic

expectations to delightful surprises. This model has been widely used across various sectors to enhance product development and customer satisfaction strategies. However, its application in the realm of food packaging requires a nuanced approach, considering the unique sensory and functional dimensions of food products (Dziuba et al., 2023; Ślusarczyk and Kot, 2018). This article seeks to bridge this gap by applying the Kano Model to decode the complex tapestry of consumer preferences in food packaging. Through this lens, we aim to provide actionable insights that can lead to more informed and strategic packaging decisions, ultimately fostering a more profound connection between food brands and their consumers.

The proposed approach may be useful in other utilitarian areas where arbitrary decisions made by the recipient are of significant importance. Examples could be tangentially costly decisions related to environmental protection, where one must argue for distant and long-term societal benefits in a situation where significant personal costs are incurred here and now (Bajdur et al., 2016; Kasner et al., 2019). The situation is easier when the benefits are also directly personal (Djokovic et al., 2022; Kręska-Pyrz et al., 2022).

Such situations may also occur within businesses when future benefits of material innovations clash with current implementation costs of new materials (Ulewicz et al., 2013; Ulewicz et al., 2014) or technologies (Dudek et al., 2017; Kuciel et al., 2019).

Facilitation may come from commonly used methods of making products or services more attractive (Skalska-Cimer and Kadłuczka, 2022), long-known in the civilian building industry (Shcheviova, 2022; Malewczyk and Czyż, 2022), urban environmental engineering (Ścieżor, 2022), as well as in education (Radek et al., 2023). These are significant factors in the acceptance of costly environmentally sustainable solutions (Marchwiński, 2021). However, attention should always be directed towards the ethical aspect of socio-technical manipulation methods (Fobel and Kuzior, 2019; Kuzior, 2022).

2. KANO MODEL

The Kano Model presents a framework for categorizing the attributes of a product or service based on how they are perceived by customers and their effect on overall satisfaction. Within the context of food packaging, these categories become particularly relevant given the diverse factors that influence consumer decisions.

Must-Be Quality (M): These fundamental attributes are often taken for granted by consumers but are critical to their baseline satisfaction. In the realm of food packaging, hygiene and safety stand paramount as they are not just preferences but regulatory requirements. Packaging must ensure the integrity of the food product, preventing contamination and preserving freshness. Any compromise on these attributes can lead to immediate and profound dissatisfaction.

One-Dimensional Quality (O): These are the performance-based aspects of packaging where satisfaction is directly proportional to the level of performance. Durability ensures that the packaging can withstand handling and transportation without compromising the product. Convenience factors, such as ease of opening, reseal ability, and portability, enhance the user experience. The performance of these attributes can be objectively measured, and their optimization can serve as a differentiator in the marketplace.

Attractive Quality (A): Features categorized as Attractive Quality are not expected but can significantly enhance consumer satisfaction. They are the 'delighters' or the 'wow factors' that can turn a mundane product into an extraordinary one. In food packaging, this may

include innovative design elements, such as unique shapes or interactive elements, and the use of eco-friendly materials which cater to the growing consumer consciousness around sustainability. While their absence might not lead to dissatisfaction, their presence can elevate a brand and foster consumer advocacy.

Indifferent Quality (I): These are the characteristics that have a negligible impact on the consumer's level of satisfaction or dissatisfaction. They are neutral, and changes in these features typically go unnoticed. For example, the inside colour of the packaging might be largely inconsequential if it does not affect the product's visibility or use.

Reverse Quality (R): In certain instances, what might be an attractive feature for one sociodemographic could lead to dissatisfaction in another. These are features that have the potential to turn off a segment of consumers if present. For example, the use of excessive packaging material may be seen as wasteful and environmentally unfriendly, leading to dissatisfaction among environmentally conscious consumers. The research being carried out is of a pilot nature and is carried out to ensure the reliability and validity of the questionnaire. The conducted research is of a pilot nature and is aimed at ensuring the correctness of the questions formulated in the questionnaire. Fundamental attributes comprise the essential elements that consumers inherently expect from the packaging of food products, serving the primary functions of containment and preservation. Their absence leads to complete dissatisfaction, as these are considered baseline requirements for packaging functionality (Matzler et al., 2022; Krzywda, 2019). Performance attributes, on the other hand, have a direct correlation with consumer satisfaction: the greater the degree to which these attributes are realized, the higher the consumer contentment. Conversely, their absence or poor execution can result in dissatisfaction. These include aspects such as usability, durability, and aesthetic appeal of the packaging (Tan et al., 2001; Walichnowska et al., 2023; Krynke et al., 2022; Ingaldi et al., 2022). Excitement attributes, meanwhile, are not expected but have the potential to significantly enhance consumer satisfaction. They are unexpected features that can provide a sense of surprise and delight, such as innovative design elements or additional functionalities. Although their absence doesn't negatively impact satisfaction, their presence can markedly improve the consumer's perception and enjoyment of the product (Löfgren and Witell, 2008). Indifferent attributes are those that consumers do not have strong feelings about; these features neither increase nor decrease satisfaction because they are not critical to the consumer's experience with the product. Lastly, reverse attributes are those that, when too pronounced or overly executed, can lead to dissatisfaction due to divergent consumer preferences. This acknowledges the diversity among consumers, where a feature that pleases one individual might displease another.

3. METHODOLOGY

The research employs a descriptive, cross-sectional survey design to collect primary data on consumer preferences regarding food packaging. This approach facilitates the application of the Kano Model to comprehend how different packaging features influence consumer satisfaction. The stratified sampling technique is adopted to ensure representation across key sociodemographic variables of the study group, such as age, gender, income, and geographic location. The target sample size should be determined using power analysis to ensure that the study results are statistically significant. However, in this case, one is dealing with pilot studies, and the research sample is limited both geographically (Silesian Voivodeship) and in terms of the number of respondents (128

people). The primary instrument for data collection is a structured questionnaire divided into two sections. The first section captures sociodemographic information and general buying habits related to food products. The second section is designed based on the Kano Model, where participants rate various packaging attributes on a ten-point scale.

The identification of quality characteristics for specified attributes necessitates the execution of a detailed survey. A method employed for such research is the so-called "quality game," which aims to elucidate the nature of individual characteristics (Williams et al. 2008). This process is graphically depicted in Figure 1. This methodology scrutinizes the customers' reactions to the feature under investigation. According to Kano Net al. (1984), the client is presented with two scenarios for each feature:

- The scenario where the feature is included in the product and operates as expected.
- The scenario where the feature is absent from the product or is not functioning satisfactorily.

The analysis of customer responses in these scenarios facilitates the classification of the feature into one of the five main categories: Must-Be, One-Dimensional, Attractive, Indifferent and Reverse Quality. Each category reflects a different level of impact on customer satisfaction and allows researchers to prioritize features accordingly in product development.

These questions are usually as follows:

- | | |
|---|---|
| <p>If a given feature occurs, how do you feel?</p> <ol style="list-style-type: none"> 1. Suits me. 2. It has to be like this. 3. I do not care. 4. I can live with that. 5. It does not suit me. | <p>If a given feature does not occur, (or is not working properly), how do you feel?</p> <ol style="list-style-type: none"> 1. Suits me. 2. It has to be like that. 3. I do not care. 4. I can live with that. 5. It does not suit me. |
|---|---|

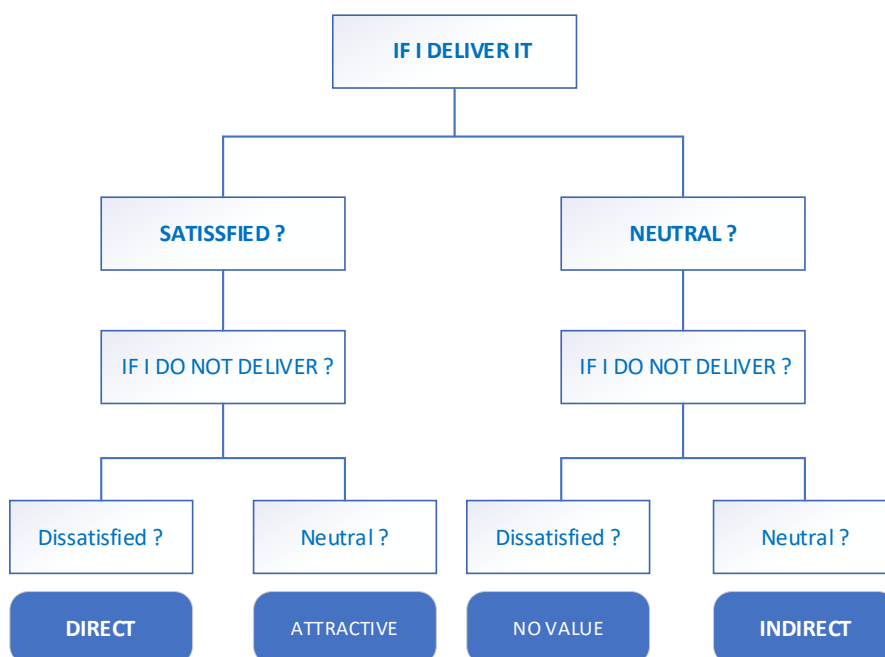


Fig. 1. Scheme of the quality game in the Kano method

One variant treats feature in a positive way, and the other in a negative. For each feature we receive a combination of two answers. Each answer can take five values, in total we can receive twenty-five variants of combinations. Combinations are presented in Table 1.

Table 1.
Determination of the type of feature in the Kano method

		Negative				
Positive		Suits me	It has to be	I do not care	I can live with that	It does not suit me
	Suits me	Q	A	A	A	O
	It has to be	R	I	I	I	M
	I do not care	R	I	I	I	M
	I can live with that	R	I	I	I	M
	It does not suit me	R	R	R	R	Q

Based on a comprehensive review of the literature and interviews conducted with experts, a list of over 50 qualitative attributes for food product packaging was developed. For analytical purposes, 25 factors were selected that received the highest importance coefficient according to the opinions of both experts and consumers (Table 2).

This list was meticulously curated through methodical research involving a meta-analysis of existing studies in the field, coupled with qualitative data gathered from structured interviews with industry professionals and focus groups comprising a diverse range of consumers.

3. RESULTS AND DISCUSSION

Pilot studies were conducted in the Silesian Voivodeship among urban populations exceeding 100,000 residents. A total of 72 individuals aged 21-24, along with 56 individuals aged over 25 (32% within the 25-45 age group, and 68% aged 45 and older), responded accurately to the survey questions. The majority of the quality attributes of customer preferences were classified as one-dimensional, with a portion of these attributes being related to ergonomics. Table 2 presents a comparison of the study results for the group aged 21-24 and for the group aged over 25 years.

Table 2
The importance of quality attributes of packaging of a food product according to customers

Attribute	Kano, Age category 21-24	Attribute Strenght 21-24	Kano, Age category 25+	Attribute Strenght 25+
1. Barrier Properties: Resistance against external factors like oxygen, light, or moisture.	Must-Be	8.94	Attractive	9.89
2. Durability: The packaging's strength to withstand physical stress during handling and transport.	One-Dimensional	6.44	One-Dimensional	6.54
3. Tamper-Evidence: Features that indicate whether the packaging has been opened or tampered with.	One-Dimensional + Must-Be	7.36	Must-Be	8.04
4. Sustainability: Use of materials that are recyclable, biodegradable, or derived from renewable sources.	One-Dimensional	6.07	Attractive	6.98

5. Ergonomic Design: The ease with which consumers can handle and use the packaging.	One-Dimensional + Attractive	6.25	One-Dimensional	7.61
6. Aesthetic Appeal: Visual attractiveness of the packaging, including design and color.	Attractive	6.47	Attractive + Indifferent Quality	7.02
7. Brand Representation: The packaging's effectiveness in communicating the brand's message and identity.	One-Dimensional	6.68	Attractive	7.59
8. Usability: Convenience in opening, using, resealing, or disposing of the packaging	One-Dimensional	6.72	Attractive	6.93
9. Product Compatibility: The suitability of packaging materials for the specific food product.	Must-Be + One-Dimensional	7.43	Must-Be + Attractive	8.98
10. Protective Function: The packaging's ability to protect the content from spoilage and damage.	One-Dimensional	7.28	Attractive	8.45
11. Regulatory Compliance: Adherence to food safety and packaging regulations.	One-Dimensional	6.31	One-Dimensional	6.77
12. Portion Control: The ability to contain and dispense specific amounts of the product	One-Dimensional + Attractive	7.60	Attractive	8.91
13. Stackability: The efficiency of packaging shapes and materials in allowing for stacking during storage and transport.	One-Dimensional	7.96	Attractive	8.77
14. Transparency: The clarity of the packaging material to allow consumers to view the contents	One-Dimensional	6.46	One-Dimensional	6.84
15. Insulation Properties: The ability to maintain temperature-sensitive products at the desired temperature.	One-Dimensional	7.06	Attractive	8.48
16. Resealability: The capacity of the packaging to be closed again after opening to maintain product freshness.	One-Dimensional	7.49	Attractive	8.18
17. Lightweight: The use of materials that minimize the weight of the packaging without compromising on strength.	One-Dimensional	7.74	Attractive	8.25
18. Cost-Effectiveness: The balance between packaging quality and the cost to produce it.	One-Dimensional	7.14	Attractive	8.23
19. Traceability: Features like QR codes or batch numbers that enable tracking the product's history.	One-Dimensional	7.54	Indifferent Quality	8.52

20. Innovation: Incorporation of new technologies or designs that improve user experience or product shelf life.	One-Dimensional + Attractive	6.97	Indifferent Quality +Attractive	7.89
21. Material Quality: The overall quality, including purity and safety, of the materials used in packaging.	One-Dimensional	7.62	Attractive	8.45
22. Printing and Labeling Quality: The clarity, durability, and accuracy of printed information and labels on the packaging.	Must-Be	7.22	Must-Be	8.57
23. Odor Neutral: The packaging materials' ability not to impart any odor that could affect the product's taste or smell.	Must-Be	7.06	One-Dimensional	8.54
24. Environmental Impact: The degree to which the packaging affects the environment throughout its lifecycle.	One-Dimensional	6.71	Attractive	8.70
25. Additional functions e.g.: Advanced seals that provide visible evidence if the packaging has been tampered with or opened.	One-Dimensional+ Attractive	6.06	Attractive	8.29

The study investigated the perceived importance of various quality features of food packaging by consumers in two separate age groups: 21-24 years of age and over 25 years of age. The application of the Kano model revealed changes in the importance of these attributes, also reflecting the different expectations and experiences of the two groups. For the younger group (21-24), "Barrier Properties" were considered basic "Must-Be" requirements, reflecting an expectation that food packaging should inherently protect against environmental factors. In contrast, the older group (over 25) perceived these as "Attractive" features, suggesting that with age and experience, the ability to protect against external factors may be seen as a value-added aspect rather than a given. "Durability" maintained its "One-Dimensional" classification across both groups, indicating a consistent understanding that the packaging's ability to withstand stress is directly related to customer satisfaction. The "Tamper-Evidence" attribute was classified as mixed in the younger group, suggesting that it is both a core requirement and a performance factor. Older participants, however, perceived it only as a "Must-Be" feature, emphasizing safety and security as non-negotiable. "Sustainability" emerged as an "Attractive" feature for the older group, potentially reflecting a growing trend in environmental consciousness among more experienced consumers. Interestingly, "Aesthetic Appeal" was seen as an "Attractive" feature by the younger group, but the older group also included "Indifferent Quality" in its classification, which could suggest that while aesthetic is important, it may not strongly influence satisfaction or dissatisfaction for more experienced individuals. "Brand Representation" and "Usability" were seen as "One-Dimensional" by the younger group but were considered "Attractive" by the older group, pointing to an increased appreciation for brand messaging and ease of use with age. "Product Compatibility" and "Protective Function" were viewed as "Must-Be" and "One-Dimensional" by the younger group, indicating they are considered both basic and performance-related. However, the older group rated these as "Attractive," which might indicate a shift toward valuing these

features as elements that can enhance satisfaction. The older group rated several features such as "Portion Control," "Stackability," "Insulation Properties," "Resealability," "Lightweight," "Cost-Effectiveness," "Material Quality," and "Environmental Impact" as "Attractive," suggesting that these attributes are perceived as adding significant value to the packaging experience. "Traceability" and "Innovation" received higher ratings from the older group, indicating a recognition of their importance in enhancing the consumer experience, but they were also associated with "Indifferent Quality," implying that these might not be decisive factors in satisfaction.

"Odor Neutral" was a "Must-Be" feature for the younger group but was seen as "One-Dimensional" by the older group, indicating that while it is essential, its impact on satisfaction may vary. The "Additional functions" attribute, was not rated by the younger group, but it was highly valued by the older group, where they categorized it as "Attractive," reflecting an appreciation for enhanced functionalities in packaging.

3. CONCLUSION

The study underscores the complexity of consumer preferences related to food packaging attributes, with clear divergences based on age groups. While some attributes are consistently valued across sociodemographics, others shift in importance as consumers' knowledge and experiences grow. The findings suggest that marketers and packaging designers should consider sociodemographic factors when developing packaging strategies, as the attributes that drive satisfaction can significantly differ among target markets. Additionally, the rising importance of sustainability and additional functionalities in packaging indicates a market shift towards more environmentally friendly and innovative packaging solutions. The study's conclusions are limited by its pilot status and small, urban-based samples, which may not reflect the broader population's views. The subjective nature of the Kano model ratings could oversimplify consumer preferences, and the study did not consider external factors that might affect these perceptions. The findings should be seen as preliminary, highlighting the need for larger-scale research that includes diverse sociodemographics and examines the evolving nature of consumer preferences.

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