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Shapes, Textures and Customer Responses – A Study of Visual Design Features

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ABSTRACT

This study examines the effects of two visual design features (i.e., dimensionality of shape and texture) on psychological responses and behavioral intentions of customers towards perfume containers. The boundary condition of buying in online and/or offline settings for the same effects is also studied. Cue utilization theory was used in developing the conceptual model. Responses were collected through two surveys, each conducted with 200 respondents. Respondents included potential customers of perfumes, including students and faculty members from the educational institutions. The dimensionality of shape and visual texture of perfume containers have significant differential effects on psychological responses and behavioral intentions of customers. Findings mainly indicate that the 'cuboid' shape and the 'glass' texture of perfume containers generate more favorable customer responses. Moreover, the buying mode acts as a boundary condition for multiple effects. Findings provide valuable implications for practitioners, including designers, producers, marketers, retailers, etailers, and managers of perfume products. Such implications are particularly related to the containers (packaging) of perfumes. Existing research on understanding the effects of two important design features (i.e., shape and texture) on customer responses is quite limited. In addition, since product design features and customer responses towards them may evolve over time in various contexts, the research on understanding their relationship needs to be updated.

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1. Introduction

How do product design features affect customer responses? This question has attracted considerable attention from researchers across different disciplines, including marketing and consumer behavior (Bloch, 1995; Crilly, Moultrie, & Clarkson, 2004; Vermeir & Roose, 2020). Since product design features may evolve over time in response to changes in cultural values and technological advancements, research on the customers' responses to product design features may need to be updated. The variety of product design features, cultural contexts, types of customers, and the variety of products or services further highlight the need and significance of more research in this area. This study therefore examines the effects of visual design features of perfume packaging (i.e., perfume containers) on customer responses *(Research Objective 1)*. Two types of visual design features (i.e., dimensionality of packaging shape and visual texture of perfume container) and two types of customer responses (i.e., psychological responses and behavioral intentions) are included in the scope of this study.

Online buying has emerged as a popular buying alternative of traditional in-store buying, for customers. Since a product's visual features and its evaluation by customers in online buying may be different from in-store buying, studying the effects of the buying mode on the relationship between visual design features and customer-related outcomes can be considered as a potential research question (Vermeir & Roose, 2020). This study therefore, aims to examine buying mode as a boundary condition for the effects of visual design features on customers' psychological responses and behavioral intentions *(Research Objective 2)*.

This study uses cue utilization theory to hypothesize and test the effects of two key design features of perfume containers on customer responses. The usage of cue utilization theory can be observed in a variety of contexts in the marketing literature (see, for example, (Baek, Huang, & Lee, 2023; Diallo & Siqueira Jr, 2017; Kakaria, Simonetti, & Bigne, 2024; Konuk, 2021; Richardson, Dick, & Jain, 1994). Several researchers have attempted to understand the effects of cues – intrinsic and/or extrinsic – on customer purchase decisions and behavioral intentions by using cue utilization theory (Chi, Pan, & Huang, 2021; Ding et al., 2025; Kakaria, Simonetti, & Bigne, 2024). However, research on understanding the effects of two important design features (i.e., shape and texture) on customers' responses is quite limited. For example, Adaval, Saluja and Jiang (2019) refer to the scant research on understanding the effects of the shapes of packaging containers. This study therefore aims to contribute by extending the marketing literature, through examining the effects of shapes and textures of perfume containers on customer responses, drawing on cue utilization theory. This study also contributes by testing the effects of two product design cues on customer responses in online settings as compared to offline settings.

2. Theory and Hypotheses

Visual perceptions can be understood or explained through two theoretical perspectives, i.e., the ecological perspective and the constructivist perspective. From the ecological perspective, perceptions are considered as inborn, not learned, and equivalent to sensations, whereas from the constructivist perspective, perceptions focus on both core (i.e., basic sensory excitation) and context (i.e., additional sensory information that can modify or affect the data generated by the basic sensory excitation) (Adaval, Saluja, & Jiang, 2019). This study uses a constructivist perspective to examine the effects of visual design cues of perfume containers on customer responses. Visual cues of product design can affect customers' psychological and behavioral responses (Bloch, 1995; Crilly, Moultrie, & Clarkson, 2004; Vermeir & Roose, 2020). Researchers have studied the effects of several visual features of product design, including for example, shape, colour, aesthetic cues, materiality, text and picture combination, location, movement, textures, geometry, font styles/typography, dimensions, graphics, and detailing on multiple psychological outcomes including for example, cognitive responses, affective responses, intentions and behavioral outcomes (Crilly, Moultrie, & Clarkson, 2004; Khan et al., 2025; Rahimi et al., 2025; Vermeir & Roose, 2020). Visual design features can change the way customers search for the desired products (Clement, 2007). Shoppers may use visual cues when selecting a product at a retail outlet (Huddleston, Coveyou, & Behe, 2023). Consumers may infer the intrinsic features of a product based on its packaging (Underwood & Klein, 2002). Packaging can also help in the creation and communication of brand identity and in developing brand-customer relationships. (Underwood, 2003). Furthermore, marketing decisions involving packaging design features can help businesses achieve positive aesthetic evaluation of packaging, which can lead to positive purchase intentions of customers (Bigoin-Gagnan & Lacoste-Badie, 2018). Similarly, visual design principles can affect the multisensory experience along with the purchase intentions of customers (Lee & Lim, 2023). Even in the case of virtual stores, visual cues or design elements can affect consumer behaviour (Han, Park, & Hyun, 2022).

2.1. Effects of Dimensionality of Shapes on Customer Responses

Customers may prefer to buy unique and unusual shapes (Adaval, Saluja, & Jiang, 2019). Unique shapes (e.g., in the case of perfume bottles) may not only attract the visual attention of customers but also make them curious about the product (Modi & Singh, 2024). The attractive shapes of product packaging can also change the judgment of people about the same product. For example, customers may judge an attractive shape of a product's packaging as containing more volume of the product than a less attractive same-sized packaging (Folkes & Matta, 2004). Customers may respond differently to varying shapes, for example; a straight

shape (as compared to a curvy shape) can provide positive utility for customers in the case of food presentation (Silayoi & Speece, 2007). Similarly, a vertical shape can be more promising than a horizontal rectangular shape in the case of packaging of ready-to-eat traditional food (Suci et al., 2022). However, Adaval, Saluja and Jiang (2019) have reported the relatively scant research on the effects of the shapes of packaging containers.

2.2. Effects of Visual Texture on Customer Responses

Visual textures do not only represent abstract optical designs, they may also indicate substantive properties of the materials (Pickett, 1968). Customers can consider the texture of the packaging design when developing their perceptions about and evaluating the quality of products (Iseki, Mase, & Kitagami, 2025). Marketers may use visual textures to enhance the packaging feel of their products (Spence, 2016). In real life, texture can be tactile, aural, and/or visual (Djonov & Van Leeuwen, 2011). Another type of texture is oral texture, which refers to the texture of the food in the mouth (Rolls, 2010). This study tests the effects of visual texture only. Researchers have studied and reported the effects of different types of textures in the existing literature. For example, customers may perceive biscuits taken from a rougher pot as crunchier and harder than those taken from a smoother pot (Piqueras-Fiszman & Spence, 2012). Visual textures may have some crossmodal association with temperature concepts (Barbosa Escobar et al., 2023). Similarly, the texture of a food that one feels in the mouth may affect perceived pleasantness (Rolls, 2010).

2.3. Cue Utilization Theory, Visual Design Cues and Customer Responses

Based on the above-mentioned existing literature, both the design features (i.e., dimensionality of shapes and visual texture) can be considered cues that customers may use in developing their judgments, evaluations, or intentions. Cue utilization theory supports here to design the conceptual model of this study (Figure 1), because the existing literature has used this theory to understand the effects of different types of cues on customers' purchase decisions, psychological responses and behavioral intentions (Cheng et al., 2024; Chi, Pan, & Huang, 2021; Ding et al., 2025; Kakaria, Simonetti, & Bigne, 2024; Visentin & Tuan, 2021). Drawing on cue utilization theory and existing literature, this study hypothesizes the following effects of dimensionality of shape and visual texture on customers' responses.

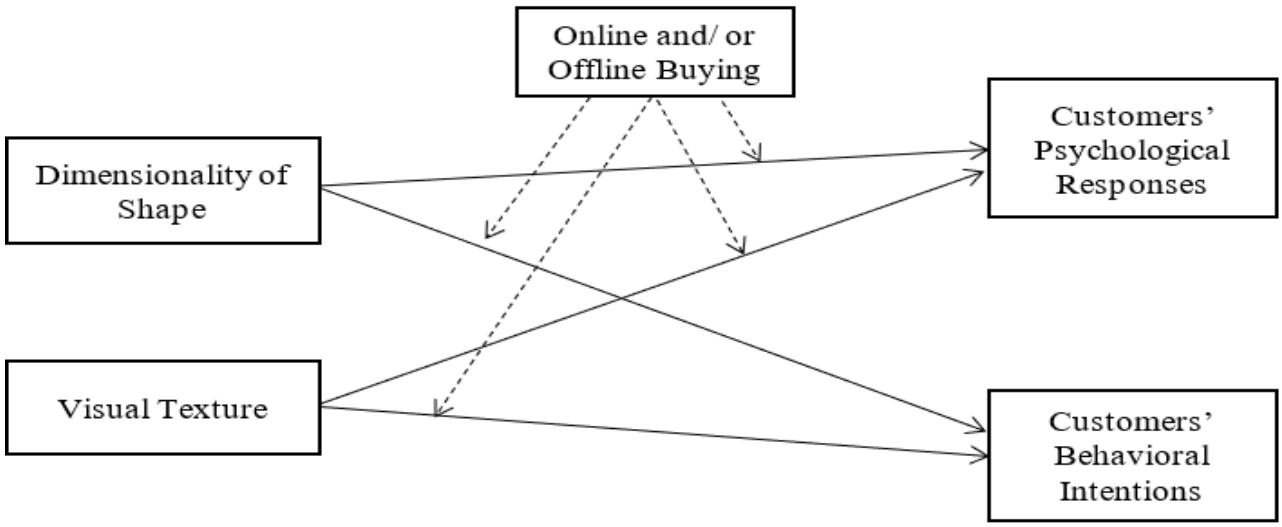
H1: Dimensionality of the shape of a perfume container significantly affects customers' psychological responses.
H2: Dimensionality of the shape of a perfume container significantly affects customers' behavioral intentions.
H3: Visual texture of a perfume container significantly affects customers' psychological responses.
H4: Visual texture of a perfume container significantly affects customers' behavioral intentions.

2.4. Buying Mode as a Boundary Condition for the Relationships between Selected Visual Cues and Customer Responses

Researchers have proposed or considered several boundary conditions (or moderating factors) when studying the effects of visual design features on psychological and behavioral outcomes, for example, situational/context-related factors, personal factors, product-related factors, market factors, and cultural factors (Bloch, 1995; Crilly, Moultrie, & Clarkson, 2004; Vermeir & Roose, 2020). Such boundary conditions may affect how customers perceive the visual design features and respond to them (Crilly, Moultrie, & Clarkson, 2004). This study hypothesizes buying mode as a boundary condition for the effects of visual design features on customers' responses. There are multiple reasons behind such hypothesized effects of the buying mode. Customers may behave or respond to a design differently when they are alone (i.e., in a private social setting) than when they are in the presence of peers (Bloch, 1995). The movement of a product in an online setting (e.g., on a website) can be an influential design feature, whereas customers may lack the touch as an informational cue in the same online setting (Vermeir & Roose, 2020). Customers may perceive the color saturation of packaging differently in an online setting compared to an offline setting (Vermeir & Roose, 2020). Vermeir and Roose (2020) call for future studies to understand how the effects of visual features on behavioral outcomes vary in online versus offline settings. Based on the existing literature, the following effects of the buying mode are hypothesized in this study:

H5: Buying mode affects the relationship between dimensionality of shapes and customers' psychological responses.
H6: Buying mode affects the relationship between dimensionality of shapes and customers' behavioral intentions.
H7: Buying mode affects the relationship between visual texture and customers' psychological responses.
H8: Buying mode affects the relationship between visual texture and customers' behavioral intentions.

Figure 1: Conceptual Model



3. Method

This study used a quantitative research approach by surveying perfume customers. Those customers included students and faculty members of educational institutes (in Multan, Pakistan). Structured questionnaires were distributed in person to the respondents for increasing the response rate and to provide any guidance in filling the questionnaires at the spot. Two surveys were conducted to separately test the effects of the dimensionality of shape (Survey 1) and visual texture (Survey 2) on customer responses. 200 customers responded in each survey (after excluding incomplete responses). Respondents included both females and males (selected through purposive sampling), where every respondent was at least 18 years old. 134 females and 66 males were included in the sample for survey 1, whereas 126 females and 74 males were included in the sample for survey 2. The respondents included both online and offline perfume customers. The study examined the effects of three types of shapes (i.e., cylinder, cube, and cuboid) and three types of visual textures (i.e., ceramic, glass, and metal) on customer responses.

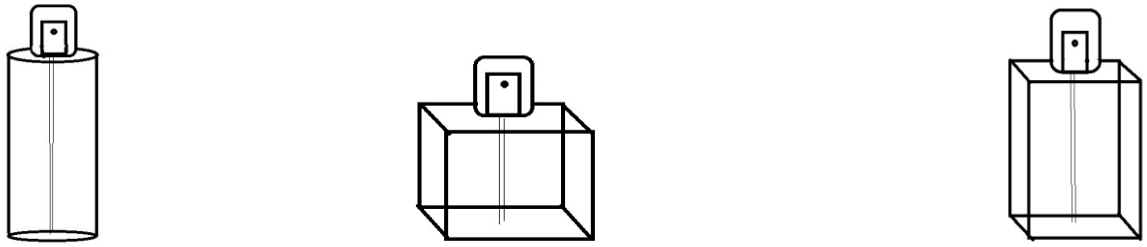
The pictures of perfume containers (see Figure 2), which represented each type of dimensionality of shape and visual texture, were printed on the questionnaires. Respondents were asked about their psychological responses and behavioral intentions for each shape and texture of the perfume container. Sixteen participants (i.e., eight PhD holders and eight students) were contacted for pretesting of the questionnaire, which was prepared to examine the effects of the dimensionality of packaging shape (Survey 1). Similarly, six participants (i.e., three PhD holders and three customers) participated in pretesting of the questionnaire, which was prepared to examine the effects of the visual texture of the perfume container (Survey 2). The study adapted the scale items mainly from the existing literature. Pretesting helped revise the questionnaires and some of the adapted scale items, based on the respondents' opinions. Using one-way analysis of variance (ANOVA), the collected responses were examined to find out how customers differed in their psychological responses and behavioral intentions across different types of shapes and visual textures of perfume containers. In case of significant differences in mean values of customers' responses across different types of shapes or textures, post-hoc tests (i.e., Tukey or Dunnett's T3) were used based on homogeneity of variances to further examine such differences. The SPSS software package was utilized for data analysis.

4. Results

4.1. Dimensionality of shape and customer responses

Significant differences in both psychological responses and behavioral intentions were found across different shapes (F=12.471; p=0.00, and F=10.459; p=0.00, respectively), where cuboid and cube shapes were preferred choices as compared to cylinder shape in psychological responses (H1 was accepted), whereas cuboid shape was preferred over cube and cylinder shapes in behavioral intentions (H2 was accepted) (see Table I).

Figure 2: Shapes and visual textures of perfume containers, used in the questionnaires of this study



Cylinder **Cube** **Cuboid**

3D shapes of perfume containers

Ceramic **Glass** **Metal**

Table I: Results Summary – Dimensionality of Shape and Customer Responses

Dimensionality of Shape	Customers' Responses (Mean Values)	
	Psychological Responses	Behavioral Intentions
Cylinder	3.261	3.339
Cube	3.477	3.503
Cuboid	3.559	3.686
Significant Differences (Yes/No)	Yes (F=12.471; p=0.00)	Yes (F=10.459; p=0.00)
Preferred Dimensionality of Shape	Cuboid and Cube	Cuboid
Hypotheses (Result)	H1 (Accepted)	H2 (Accepted)

Table 2: Results Summary – Visual Texture and Customer Responses

Visual Texture	Customers' Responses (Mean Values)	
	Psychological Responses	Behavioral Intentions
Ceramic	3.210	3.025
Glass	3.938	3.954
Metal	3.327	3.228
Significant Differences (Yes/No)	Yes (F=50.422; p=0.00)	Yes (F=47.373; p=0.00)
Preferred Dimensionality of Shape	Glass	Glass
Hypotheses (Result)	H3 (Accepted)	H4 (Accepted)

4.2. Visual texture and customer responses

Psychological responses (F=50.422; p=0.00) and behavioral intentions (F=47.373; p=0.00) both varied significantly across different visual textures (see Table 2). Therefore, H3 and H4 were accepted. Post-hoc analysis revealed a significantly higher effect of glass containers on both types of customer responses as compared to those of ceramic and metal textures of perfume containers.

4.3. Effects of Buying Mode on the Relationships between Dimensionality of Shape and Customer Responses

This study examined the effects of three buying modes (i.e., online, offline, and both online and offline) on the relationships between the dimensionality of shape and customer responses. Results (see Table 3) reveal the significant differential effects of dimensionality of shape on customers' psychological responses in case of customers who buy perfume/s offline or from both offline and online channels; whereas such differential effects were found insignificant in case of customers who buy perfume/s online (H5 was accepted). The cuboid shape had a significantly higher effect on psychological responses than the cylinder shape in the case of offline/in-store perfume buying, whereas the effects of the cube shape on psychological responses were not significantly different from those of cuboid or cylinder shapes in the case of the same buying mode. However, the cube shape had a significantly higher effect on psychological responses than the cylinder shape in the case of perfume buying from both offline and online channels; whereas the effects of the cuboid shape on psychological responses were not significantly different from the cube or cylinder shape in such buying mode. H6 was also accepted because the differential effects of dimensionality of shape on behavioral intentions were found insignificant in the case of buying perfumes online or through both online and offline channels, whereas such effects were found significant when customers were shopping for perfumes offline/in-store. The cuboid shape had a significantly higher effect on behavioral intentions than the cube and cylinder shapes in the case of offline/in-store perfume buying (See Table 3).

Table 3: Effects of Buying Mode on the Relationships between Dimensionality of Shape and Customer Responses

Buying Mode	Effects of Dimensionality of Shapes on: Psychological Responses	Behavioral Intentions
Online	n=28 Insignificant Differential Effects (F=0.455; p=0.64)	n=28 Insignificant Differential Effects (F=0.835; p=0.44)
Offline	n=123 Significant Differential Effects (F=9.710; p=0.00) Ranking (Mean Values): 1. Cuboid (3.632) Cube (3.470) 2. Cube (3.470) Cylinder (3.295)	n=123 Significant Differential Effects (F=8.455; p=0.00) Ranking (Mean Values): 1. Cuboid (3.740) 2. Cube (3.460); Cylinder (3.398)
Both (online and Offline)	n=47 Significant Differential Effects (F=4.543; p=0.01) Ranking (Mean Values): 1. Cube (3.643) Cuboid (3.479) 2. Cuboid (3.479) Cylinder (3.278)	n=47 Insignificant Differential Effects (F=1.994; p=0.14)
Effects of buying mode as a boundary condition (Yes/No)	Yes	Yes
Hypotheses (Result)	H5 (Accepted)	H6 (Accepted)

Table 4: Effects of Buying Mode on the Relationships between Visual Texture and Customer Responses

Buying Mode	Effects of Visual Texture on: Psychological Responses	Behavioral Intentions
Online	n=9 Significant Differential Effects (F=12.022; p=0.00) Ranking (Mean Values):	n=9 Insignificant Differential Effects (F=2.237; p=0.13)

	1. Glass (4.200) 2. Ceramic (2.978); Metal (2.711)	
Offline	n=117 Significant Differential Effects (F=23.581; p=0.00) Ranking (Mean Values): 1. Glass (3.837) 2. Metal (3.270); Ceramic (3.152)	n=117 Significant Differential Effects (F=33.149; p=0.00) Ranking (Mean Values): 1. Glass (4.031) 2. Metal (3.231); Ceramic (2.993)
Both (online and Offline)	n=71 Significant Differential Effects (F=21.601; p=0.00) Ranking (Mean Values): 1. Glass (4.087) 2. Metal (3.509) Ceramic (3.339)	n=71 Significant Differential Effects (F=12.528; p=0.00) Ranking (Mean Values): 1. Glass (3.848) 2. Metal (3.330) Ceramic (3.073)
Effects of buying mode as a boundary condition (Yes/No)	No	Yes
Hypotheses (Result)	H7 (Rejected)*	H8 (Accepted)

* (Almost similar results with some variations in rankings of the effects across different buying modes).

4.4. Effects of Buying Mode on the Relationships between Visual Texture and Customer Responses

This study also examined the effects of three buying modes (i.e., online, offline, and both online and offline) on the relationships between visual texture and customer responses. Results (see Table IV) revealed significant differential effects of visual texture on psychological responses in all three buying modes. Such significant effects were almost similar, with some variations in rankings of these effects across different buying modes. The glass texture of perfume containers had a higher effect on psychological responses than the ceramic and metal textures, in all three buying modes. H7 was therefore rejected. In contrast, H8 was accepted because the differential effects of visual texture on behavioral intentions were found insignificant in the case of buying perfumes online, whereas such effects were found significant when customers were shopping for perfumes offline or in-store, or from both offline and online channels. The glass texture of perfume containers had a higher effect on behavioral intentions than metal and ceramic textures, in the case of offline buying and when using both offline and online channels for buying perfumes (see Table IV).

5. Discussion and Implications

The results of this study largely conform to the implications of cue utilization theory, as the dimensionality of shape and visual texture are found to affect psychological responses and behavioral intentions of customers. The results reveal that customers consider both the design features as cues, which can affect their psychological responses and behavioral intentions. Overall, a cuboid-shaped, glass bottle can generate more favourable customer responses. Similarly, to a greater extent, such effects are relatively more significant in the case of offline settings where customers shop in physical stores. Through these findings, this study extends the literature on the effects of visual design cues on customers' responses, particularly from the perspective of cue utilization theory. Moreover, the findings of this study also address the call of Vermeir and Roose (2020) for studying the effects of visual features on behavioral outcomes in online as compared to offline settings.

5.1. Managerial Implications

The findings of this study have implications for the designers, producers, marketers, retailers, etailers, and managers of perfume products and brands. Such implications are particularly related to the containers (packaging) of perfumes. As this study reveals, both the visual design features (i.e., dimensionality of shape and visual texture) of perfume containers can play a significant role in developing favourable psychological responses and behavioral intentions of customers. The cuboid-shaped glass bottle of a perfume can be a better choice for practitioners than the other dimensionalities of shape (i.e., cube or cylinder) and textures (i.e., metal or ceramic), when they want favourable responses from their customers. Retailers and

etailers can use the findings of this study to improve the shopping experience of customers. By using the type of shape and visual texture that customers like the most, favourable psychological responses and behavioral intentions of customers can be achieved. Moreover, retailers and etailers can enhance the effectiveness of their visual merchandising strategy and actions by applying the findings of this study in both online and offline buying situations. An investigation of a boundary condition in this study suggests that the buying mode may affect the way customers respond to the visual design features. For example, cuboid shape and glass texture of perfume containers can be more preferable choices in the case of offline/in-store buying of perfume containers. In contrast, in online buying, customers' responses may not vary across different dimensionalities of shape and visual textures, with one exception: a perfume container with a glass texture can generate more favourable psychological responses than ceramic and metal textures in online buying.

5.2. Limitations and Future Research Opportunities

Some key limitations of this study and opportunities for future research include the following:

Customers may have past associations in their memory that may affect their current perceptions about the visual features (Adaval, Saluja, & Jiang, 2019). This cross-sectional study did not examine any such past associations (i.e., product or brand-related associations) of customers. Future research may test the effects of past associations on customers' responses to visual design cues. Customers can have exposure to multiple visual cues simultaneously. Future researchers may test the combined effects of multiple visual cues on customer responses. For example, the color, shape, and texture of packaging can jointly affect a customer's response in real life. This study included buying mode as a boundary condition for testing the effects of visual design cues on customers' responses. Future researchers may hypothesize and test other boundary conditions for the same effects, including, for example, customers' age, gender, income class, social class, buying motives of the customers, and place of origin of the product. Some future qualitative studies may attempt to explore the underlying reasons behind relatively more favourable customer responses towards the cuboid shape and the glass texture, as found in this study. Culture can affect the way customers respond to elements or details of packaging design (Silayoi & Speece, 2007). Future cross-cultural studies can test the effects of visual design cues on customers' responses by taking cultural characteristics as boundary conditions. Some more trendy designs (i.e., design features) can be included in the scope of future studies. Similarly, instead of showing pictures on the questionnaire, an actual physical form of the products/ prototypes can be shown to customers when collecting their responses in future studies. This practice may help improve the accuracy of the collected responses.

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