

## Article

# Influence of Complexity in Low-Fat Food Packaging on Chinese Consumers' Purchase Intentions

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**Abstract:** Packaging design is one of the most important visual representations of low-fat foods and is a key factor in the perception of the health of the product. The complexity of packaging induces the automatic processing of relevant concepts by consumers, which affects their attitudes; however, this process is not well understood. We developed a sequential mediation model based on the theories of conceptual fluency and conceptual metaphor to examine the impact of packaging complexity on consumers' purchase intentions. In this study, 353 volunteers were recruited to participate, and variables were measured using questionnaires on packaging intention, brand complexity, concept fluency, and brand attitude. The results indicated that it was simple to increase consumers' conceptual fluency and brand attitude; conceptual fluency had a significant predictive effect on brand attitude and purchase intention; brand attitude had a significant predictive effect on purchase intention and conceptual fluency; and brand attitude served as a mediator between packaging complexity and purchase intention. This study demonstrated that the general characteristics of packaging design could influence consumers' purchase intentions and provide direction for the packaging design of low-fat foods. In addition, we examine the study's theoretical and practical implications.

**Keywords:** food packaging; conceptual fluency; conceptual metaphor theory; brand attitude; purchase intention



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## 1. Introduction

One of the major concerns of public health institutions and regulators is the improvement of health and the prevention of chronic diseases such as malnutrition, cardiovascular diseases, and diabetes. Dietary habits of individuals have been singled out as the most significant factor contributing to the deteriorating health status of the developed world. Rising obesity rates within all age groups affect the spread of non-communicable diseases, imposing immense costs on health systems and the whole society [1,2]. Obesity has been prevalent for several decades in countries such as the UK and the US, and there is a wealth of economic research on obesity in these areas. However, with the growth of the economy in developing countries and the globalization of lifestyles and values worldwide, there are now more new cases of obesity appearing in these developing countries. Despite the increase in the actual number of obese individuals, related research is relatively scarce. As obesity is a new pandemic symptom that has gradually arisen with social development, effectively preventing and controlling it during the transition in developing countries may help reduce the obesity problem in these countries. Hence, conducting economic research on obesity in developing countries has special significance.

The largest developing country in the world, China, can avoid huge losses in manpower and finance by effectively conducting research on obesity. Such research can also be used as a reference for other countries. Researching obesity requires the cooperation of multiple disciplines such as medicine, biology, food science, sociology, and economics [3]. Studies have shown that a low-fat diet is helpful in preventing and treating obesity, while high-fat diets are more likely to cause obesity and lead to circulatory system diseases. Food packaging may be an effective and affordable way to improve the overall quality of diet.

At the same time the position of healthy food in the food industry is rising, environmental and ethical concerns are also becoming increasingly important in consumers' product choices [4]. The demand for healthy and ethical food is on the rise around the world, especially among the emerging middle class in the Asia Pacific region who seek healthier, safer, and more environmentally friendly food options [5]. For example, one Iranian study developed a healthy, low-cost, and environmentally friendly food basket to decrease the amount of sugar, salt, and fat in the diet, which makes it more sustainable healthwise [6,7]. It is therefore known that consumers can reduce the environmental damage and pollution caused by unhealthy substances (trans fats, etc.) if they follow sustainable dietary principles when making food decisions. The increasing environmental concern among consumers in their selection of food products also seems to include the packaging [4]. Although there appears to be a growing interest in packaging from an environmental perspective, previous research on consumers' environmental preferences for packaging is sparsely reported [8,9]. Food packaging has proven not only to be important to consumers but also to have a great potential to actually contribute to environmental sustainability [10,11]. Millennials choosing a healthier lifestyle will pay more attention to information cues and visual cues on packaging when making food decisions [12]. All indications are that packaging has an important role to play in guiding consumers towards sustainable consumption.

Healthy food is also on the rise in the food industry with demand for healthy and ethical food on the rise everywhere, especially among the emerging middle class in the Asia Pacific region who are seeking healthier, safer, and more environmentally friendly food options [13]. As people have paid more attention to body management in recent years, the consumption of low-fat foods has begun to increase, and the demand for food has also continued to rise. Food packaging serves not only as a safe and fresh container for food but also as a means to convey the value of the contents and persuade prospective consumers to purchase the product [14]. Numerous factors influence consumers' food purchasing decisions, including price, quality, taste, packaging, logos, and product labels [15]. Notably, food packaging is directly associated with consumers' perceptions of food brands and is one of the most influential factors influencing consumers' purchasing decisions. Thus, designers can communicate information through the style of food packaging [16]. As low-fat foods are becoming an increasingly important part of people's diets, the study of packaging design is of great theoretical and practical importance as a key visual information element in consumers' food purchases, attracting their attention, changing their perceptions, and influencing their choice behavior [17]. In recent years, many well-known international brands, such as Pepsi and Starbucks, have opted for a simpler appearance and design style when redesigning their brand logos and packaging, and the public adores their products [18]. It may be because parsimony is somewhat related to conceptual fluency, and conceptual fluency leads to more favorable evaluations [19].

Food packaging sometimes uses design elements with metaphors to evoke emotions and motivations in consumers; for example, one study found that green packaging was more likely to be purchased by consumers with healthy food needs than red packaging [20]. Recent research has also revealed that the simplicity and complexity of packaging can substantially affect consumers' purchase intentions. Researchers have found a correlation between packaging complexity and health and enjoyment [21]. According to one study, simplicity was associated with the beginning and complexity with the end of time [22]. Nevertheless, visual complexity has been conceptualized and operationalized in various ways [23]. From the perspective of conceptual metaphors, people frequently use "high" or "low" to indicate weight gain or loss [24,25] when discussing their body mass index. Therefore, we intend to extend previous research by establishing a connection between the complexity of food packaging and the "simple, clean, and low-calorie" code behind low-fat foods and by investigating whether simple packaging is more likely to induce "reduction" and form a mapping relationship with the conceptual metaphor of "low calorie." Moreover, the activation of conceptual metaphors may result in different brand perceptions

and attitudes among consumers [26]. Therefore, we hypothesize that the complexity of low-fat food packaging will substantially affect consumers' attitudes. Furthermore, we hypothesize that conceptual fluency may mediate this process, influencing consumers' purchase intentions via their attitudes.

## 2. Theoretical Basis and Model Assumptions

### 2.1. Relationship between the Packaging Complexity of Low-Fat Foods and Consumers' Purchase Willingness

The graphic design and overall visual appearance of packaging can significantly impact consumers' perceptions of food and attitudes toward products [27–30]. For example, the color saturation of packaging affects consumers' perceptions of product size [31], price [32], and nutritional value of food [31,33]. Furthermore, several recent studies have found that packaging complexity can substantially affect consumer preference [21,22]. In addition, researchers believe that visual complexity influences consumers' perception of content and brand image [34–36].

Comparing the impact of visually simple and visually complex advertisements on consumers' emotions and purchase intentions, Kusumasondjaja and Tjiptono [23] discovered that visually complex advertisements could generate a higher level of pleasure and arousal than visually simple advertisements, which led to a higher purchase intention. Nevertheless, according to the research of Favier et al. [21], consumers viewed simple packaging as healthier and more reliable, whereas complex packaging was viewed as more joyful and imaginative; overall, consumers preferred simple packaging and demonstrated higher purchase intentions for simple packaging. Furthermore, another study found that for unfamiliar food brands, consumers were likelier to purchase food with simple, flat logos rather than complex logos [37]. In contrast, the opposite was true for familiar brands. Finally, Chen et al. [22] combined complexity with time metaphors and discovered that at the start of time, people have a lower need for arousal and therefore prefer simple packaging.

Pieters et al. [35] analyzed 249 advertisements using eye-tracking technology. They discovered that feature complexity damaged consumers' attention to the brand in visual presentation and harmed advertising attitudes. In contrast, design complexity helped consumers see advertisements and pictures, which benefited their overall comprehension and attitude toward advertisements. Orth and Crouch [34] investigated the effect of visual complexity on consumer attitudes by manipulating the situational complexity of brand packaging presented to consumers. They discovered that the handling of simple packaging was easier compared to complex packaging and that it was perceived as more appealing. These studies suggest that visual complexity influences viewers' comprehension and attitudes via the conceptual processing of visual elements; when viewers can process visual elements proficiently, they are more likely to have a positive effect.

Hence, we put forward the following hypothesis:

**H1.** *The complexity of low-fat food packaging will significantly influence consumers' purchase intentions.*

### 2.2. The Mediating Role of Conceptual Fluency

Conceptual fluency is the ease with which an individual processes semantic information [38]. Fluent processing can effectively reduce the resources and efforts required for individual processing, thereby substantially affecting individual decision-making. Various processing fluency types include perceptual, conceptual, and language fluency [38]. When two concepts are semantically related or consistent, they are frequently regarded as possessing greater conceptual fluency [39,40]. For example, simple designs are frequently associated with health, dependability, and moderation [36,41], whereas complex designs are frequently associated with concepts such as high emotional arousal and enjoyment. Regarding low-fat foods, the concepts of low calorie, health, and abstinence expected by

consumers are more consistent with the semantics contained in a simple packaging design than with the semantics contained in a complex design; therefore, conceptual fluency is most likely to be induced when consumers see simple packaging [38].

The conceptual metaphor theory posits that humans can borrow one concept to learn and reinforce another, with the first concept having concrete and intuitive characteristics [25]. Metaphors form a mapping relationship between concrete concepts as the origin domain and abstract concepts as the target domain. A structural metaphor is a conceptual metaphor based on the systematic association of human experience. Typically, two concepts in the source and target domains share structural similarities in structural metaphors. For instance, “down” is frequently used to indicate relatively low-quality products, whereas “up” indicates higher-quality products. Based on this metaphor, Sundar and Noseworthy [42] discovered that when the product logo of a well-known brand was placed higher on the package, consumers perceived the product to be of higher quality than when the logo was placed lower on the package. It resulted in a higher brand attitude, i.e., consumers’ overall brand evaluation. The research of Madzharov and Block [43] demonstrated that when consumers view food images on the packaging, the quantity of food depicted in the images influences their perception of food size and capacity, influencing their consumption. Currently, consumers can find a variety of low-fat foods packaged in various styles in supermarkets, and we have discovered that more retailers are opting for simple design styles for their packaging. Since the definition of reduced-fat food is food with low-fat content and low calories, simplicity can also express the concept of “less”. When the concept of “low-fat” activates the physical attribute of “conciseness”, there is a metaphorical consistency between the two, which may evoke conceptual fluency.

Researchers have discovered that conceptual fluency influences consumer attitudes positively [38,44]. Smooth information processing is generally a pleasurable experience that evokes positive emotions; when conceptual fluency is high, it positively affects aesthetic preference and consumer perception of the brand [45]. Studies have shown that the degree of conceptual fluency influences consumer perceptions of a product [46,47], leading to more favorable brand perceptions [48]. Winkielman and Berridge [49] noted that conceptual fluency can result in consumers adopting a more favorable attitude and evaluating the target. Becker et al. [15] suggested that when the color of food packaging corresponds to the connotation implied by its shape, the user’s fluency experience is enhanced, resulting in a more favorable overall product evaluation.

In food consumption research, conceptual fluency positively affects consumers’ product attitudes [50] and purchase intentions [51]. For example, when food pictures were accompanied by simple, descriptive text, Pocheptsova et al. [52] discovered that participants processed food labels with greater fluency and were more willing to purchase the food than when the labels were in difficult-to-read fonts. Gmuer et al. [51] also discovered that the fluent processing of product labels enhanced consumers’ purchase intentions and hedonic experiences. Another study on the logo design for food brands found that conceptual fluency processing can increase positive brand attitudes and consumption intentions [37].

Thus, the complexity of packaging significantly affects conceptual fluency, which in turn affects consumer attitudes toward products and purchasing intentions.

**H2.** *Conceptual fluency plays a mediating role between packaging complexity and product brand attitude.*

**H3.** *Conceptual fluency plays a mediating role between packaging complexity and product purchase intention.*

### 2.3. The Mediating Role of Brand Attitude

Brand attitude is a continual positive or negative reaction of consumers to a specific brand that functions as a continuous internal evaluation of the brand and is one of the most influential factors in determining consumers’ purchase intentions [53]. Brand attitudes can be significantly influenced by packaging complexity [54]. For familiar classic luxury brands,

Lee et al. [55] discovered that simple visual images evoked a higher perception of a luxury than complex visual images. In contrast, complex visual images of unfamiliar brands were more likely to evoke a higher perception of luxury. Recent studies have found that consumers are more likely to perceive products with simple packaging designs as noble and high quality than those with complex packaging designs [21]. Another study found that products with simple, flat logos were more likely to improve consumers' perceptions of unfamiliar food brands than products with complex, non-flat logos [37]. Therefore, consumers are likelier to have a favorable attitude toward product quality if the design is simple [21].

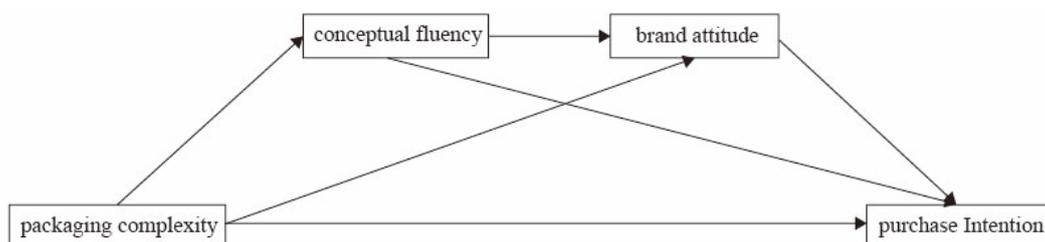
On the other hand, brand attitude influences consumers' purchase intention and behavior [56,57]. Consumers will use their preferences for brand attitudes as a guide for purchasing goods when making purchase decisions [58]. Fishbein and Ajzen [59] noted that when consumers believe a purchase is appropriate, their attitudes become more positive, which increases the likelihood that the purchase will take place; this behavior can result in better outcomes. Brand attitudes are closely related to consumers' willingness to purchase. A better brand attitude can increase consumers' enthusiasm for purchasing, loyalty, and propensity to repeat purchases [60]. Kumar and Mukherjee [61] examined the relationship between consumer attitudes and new product purchases and demonstrated the mediating role of attitudes. The authors found that their perception of products' attributes positively influenced consumers' perception and intention toward new products. The positive change in their attitudes increased consumers' purchasing intention. Packaging can influence consumers' perceptions of brand personality and product quality, thereby influencing their purchase intentions, according to research on food packaging [62,63].

Based on our review of previous research, the following hypotheses are presented:

**H4.** *Brand attitude plays a mediating role between packaging complexity and product purchase intention.*

**H5.** *Brand attitude plays a mediating role between conceptual fluency and product purchase intention; that is, conceptual fluency and brand attitude play a sequential mediating role between packaging complexity and product purchase intention.*

To summarize, the complexity of product packaging will influence the processing of product information. Furthermore, product packaging and product attributes may result in different processing fluencies due to the role of conceptual metaphors, which will influence brand attitudes and product purchase intentions. Therefore, as shown in Figure 1, we used reduced-fat foods as the research object and developed a sequence mediation model to investigate the effect of packaging complexity on consumers' purchase intentions.



**Figure 1.** Research framework.

### 3. Methods

#### 3.1. Participants

The experiment involved 320 university students from major cities such as Guangzhou and Shenzhen in China, where people have relatively high incomes, high demands on their body management and experience of shopping. Because we collected data from the major cities, we wanted to make sure that our sample was representative of the urban population in terms of demographic characteristics and consumption patterns. This geo-

graphic dispersion was intended to guarantee that our sample was representative of the urban population. The required sample size was calculated by G\*Power 3.1.9.2. Based on a medium effect size ( $f = 0.25$ ), a significant level of  $\alpha = 0.05$ , and power of 80% ( $1 - \beta = 0.80$ ), a total sample size of  $N = 179$  was needed. A total of 280 valid samples were collected by excluding 40 invalid samples. One hundred participants (35.7%) were male and 180 (64.3%) were female. Women have a better understanding and are more likely to become sick from food than men [64]. When it comes to healthy eating and living habits, studies show that women are more likely than men to make informed decisions about what they purchase at the grocery store [65]. The participants were mainly between 18 and 25 years old. The survey will be conducted from November 2021 to January 2022.

### 3.2. Research Tools

#### 3.2.1. Visual Complexity Scale

The level of packaging complexity was measured using a scale modified from the visual complexity questionnaire developed by Bossel et al. [37] consisting of a single item asking participants to rate the complexity of the presented stimulus material. The item was rated on a 7-point Likert scale, with 1 representing “very simple” and 7 representing “very complex”. After calculating the average score of all items, the more complex the visual presentation of the package, the higher the score. The Cronbach’s alpha coefficient for the questionnaire was 0.82 and average inter-item covariance was 0.96.

#### 3.2.2. Conceptual Fluency Scale

Conceptual fluency was assessed using a 7-point semantic difference scale adapted from previous studies [66–68] with one item: “Do you think this package is suitable for this kind of reduced-fat food?” The item was rated on a 7-point Likert scale, with 1 representing “strongly disagree” and 7 representing “strongly agree”. The conceptual fluency is greater the higher the score on this item. The Cronbach’s alpha coefficient for the questionnaire was 0.83 and average inter-item covariance was 0.94.

#### 3.2.3. Brand Attitude Scale

The 7-point semantic difference scale developed by Hagtvedt and Patrick [69] was modified and applied to the measurement of brand attitudes, which consisted of 4 items with the scale titles “Disagreeable/Agreeable” and “Unpleasant/Pleasant”. The average score was calculated, and the higher the score, the more favorable the consumer’s attitude toward the brand. The Cronbach’s alpha coefficient for the questionnaire was 0.96 and average inter-item covariance was 1.05.

#### 3.2.4. Purchase Willingness Scale

Additionally, we utilized the purchase intention scale developed by Ryan [70]. This one-item scale employs a 7-point scoring system, with 1 indicating “very unwilling to buy” and 7 indicating “very willing to buy”. The consumer’s purchase intention is stronger the higher the item’s score. The Cronbach’s alpha coefficient for the questionnaire was 0.88 and average inter-item covariance was 1.15.

### 3.3. Procedure

Based on the keyword search of “low-fat foods” on Taobao, the main shopping website for university students, four high selling fat loss foods were randomly selected as the target foods. To avoid the influence of brand familiarity on the experimental results, a virtual brand “SONGDAFANG” was used, and the packaging was designed by the design students using Photoshop. The design was based on the principles of simplicity and complexity in the complexity scale compiled by Pieter’s et al. [35] with Figure 2A,B representing simple packaging and Figure 2C,D representing complex packaging (Figure 2). The aim was to make a significant difference between the simple and complex packaging, considering that

the simple packaging had significantly fewer graphics than the complex packaging and that the complex packaging had more detail.



**Figure 2.** Product packaging under different conditions, (A,B) representing simple packaging and (C,D) representing complex packaging.

The survey was completed anonymously, and subjects were required to respond independently and truthfully. The introductory material for the conceptual fluency section was: “Recently, you plan to lose weight, but you usually like to eat snacks. I heard from friends that there are low-fat foods that can be used as snacks during the weight-loss period. Therefore, you plan to buy a few and try them. Open the Shopping website, I saw the advertisement of this low-fat food is simple packaging, better fat-reduced effect”. After reading, subjects were asked to complete scales of partiality, aesthetics, complexity, conceptual fluency, brand attitude, and brand fluency for each of the four stimuli (Figure 2). It took the subjects approximately 5 min to complete all of the questionnaires.

### 3.4. Data Analysis

Using SPSS 24.0, a statistical analysis of the collected data was conducted. First, the data were subjected to descriptive statistical analysis. Second, ANOVA was used to compare the effects of packaging under the two conditions on conceptual fluency, brand attitude, and purchase intention. Then, Hayes’ [71] PROCESS was utilized to examine the moderating effect of brand complexity and conceptual fluency on packaging intention and brand attitude.

## 4. Results

### 4.1. Mean, Standard Deviation, Analysis of Variance, and Correlation Matrix of Each Variable

As shown in Table 1, the results of manipulation check showed that complex packaging ( $4.09 \pm 1.15$ ) scored significantly higher than those of simple packaging ( $3.49 \pm 1.13$ ) in complexity,  $F(1, 279) = 78.52, p < 0.001$ . Additionally, the complexity of food packaging significantly influenced conceptual fluency,  $F(1, 279) = 37.48, p < 0.001$ , brand attitude,  $F(1, 279) = 62.87, p < 0.001$ , and purchase intention  $F(1, 279) = 14.20, p < 0.001$ .

**Table 1.** Mean and standard deviation ( $M \pm SD$ ) of each variable under different conditions.

	Complexity	Conceptual Fluency	Brand Attitude	Purchase Intention
Simple packaging	3.49 $\pm$ 1.13	4.79 $\pm$ 1.06	4.94 $\pm$ 0.98	4.56 $\pm$ 1.10
Complex packaging	4.09 $\pm$ 1.15	4.35 $\pm$ 1.23	4.51 $\pm$ 1.16	4.32 $\pm$ 1.25
<i>F</i>	78.52 ***	37.48 ***	62.87 **	14.20 ***

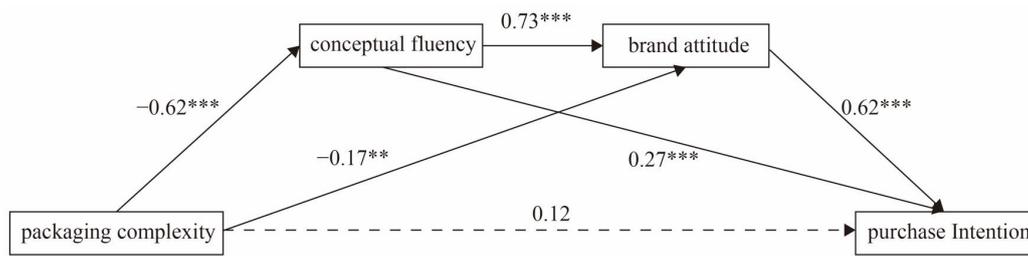
\*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

#### 4.2. Mediation Test

The non-parametric percentile bootstrap method proposed by Hayes [71] for testing mediating effects was utilized; specifically, Hayes' Model 6 of the SPSS macro (PROCESS program) was used to test the serial mediating role of conceptual fluency and brand attitude in packaging complexity and consumer purchase intention. Packaging complexity negatively predicted purchase intention ( $\beta = -0.44$ ,  $p < 0.001$ ). The results of the intermediary effect analysis revealed that packaging complexity predicted conceptual fluency significantly negatively ( $\beta = -0.62$ ,  $p < 0.001$ ), conceptual fluency predicted consumer brand attitude significantly positively ( $\beta = 0.73$ ,  $p < 0.001$ ), and packaging complexity predicted consumer brand attitude significantly negatively ( $\beta = -0.17$ ,  $p = 0.002$ ). When packaging complexity, brand fluency, and purchase intention were added to the regression equation, conceptual fluency ( $\beta = 0.27$ ,  $p < 0.001$ ) and brand attitude ( $\beta = 0.62$ ,  $p < 0.001$ ) still significantly predict purchase intention, while package complexity did not ( $\beta = 0.12$ ,  $p = 0.051$ ). The confidence interval of the mediation effect did not include 0. As shown in Table 2 and Figure 3, conceptual fluency and brand attitude significantly mediated the relationship between packaging complexity and consumer purchase intention, with a mediating effect value of  $-0.55$ . In particular, the mediating effect was composed of indirect effects generated via three paths. For the first indirect effect ( $\beta = -0.17$ ,  $SE = 0.05$ ) (packaging complexity  $\rightarrow$  conceptual fluency  $\rightarrow$  consumer purchase intention), the 95% bootstrap confidence interval ( $-0.265$ ,  $-0.087$ ) did not contain 0. For the second indirect effect ( $\beta = -0.28$ ,  $SE = 0.05$ ) (packaging complexity  $\rightarrow$  conceptual fluency  $\rightarrow$  brand attitude  $\rightarrow$  consumer purchase intention), the 95% bootstrap confidence interval ( $-0.385$ ,  $-0.189$ ) did not contain 0. For the third indirect effect ( $\beta = -0.11$ ,  $SE = 0.04$ ) (packaging complexity  $\rightarrow$  brand attitude  $\rightarrow$  consumer purchase intention), the 95% confidence interval ( $-0.182$ ,  $-0.038$ ) did not contain 0.

**Table 2.** Ninety-five percent bootstrap confidence intervals for mediating effect paths.

Intermediary Path	Effect Value	95% Confidence Interval	
		Lower Limit	Upper Limit
Packaging complexity $\rightarrow$ conceptual fluency $\rightarrow$ consumer purchase intention	$-0.17$	$-0.26$	$-0.09$
Packaging complexity $\rightarrow$ conceptual fluency $\rightarrow$ brand attitude $\rightarrow$ consumer purchase intention	$-0.28$	$-0.38$	$-0.19$
Packaging complexity $\rightarrow$ brand attitude $\rightarrow$ consumer purchase intention	$-0.11$	$-0.18$	$-0.04$



**Figure 3.** The mediating role of conceptual fluency between packaging complexity and brand attitude. Note: \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## 5. Discussion

### 5.1. Theoretical Contributions

This study collected questionnaires via an online network. By constructing a serial mediation model, we examined the effect of low-fat food packaging complexity on brand attitude and purchase intention. We confirmed the role of conceptual fluency and brand attitude as serial mediators between packaging complexity and purchase intention. Our findings indicate that simple packaging for low-fat foods is more likely than complex packaging to stimulate consumers' conceptual fluency, influencing consumers' brand attitudes and purchase intentions. The results of this study can provide packaging designers with ideas.

The psychological mechanisms of minimalist design are attracting the attention of researchers as this style of design gains popularity [21]. Previous research has demonstrated that consumers prefer simple packaging designs at the beginning of time milestones and complex packaging designs at the end of time milestones [22]. From the perspective of the structural metaphor, our research indicates that when consumers purchase reduced-fat foods, they are more likely to select relatively simple packaging. Furthermore, previous research has demonstrated that consumers' fluency perceptions influence their purchase propensity [51]. We also confirmed that conceptual fluency plays a significant role; simpler packaging may be more conducive to consuming low-fat foods. Consequently, by understanding consumers' purchase intentions, we clarified that conceptual fluency would influence users' consumption behavior and expanded prior research on conceptual fluency, thereby enhancing future studies' value.

In addition, this study investigated the relationship between consumer perceptions (brevity and complexity) from a conceptual metaphor's theoretical perspective. For example, when people saw low-fat food in a relatively straightforward package, they rated it superior. Some researchers have begun to examine the formation of consumer perceptions from a metaphorical standpoint in recent years [43,50]. Most of these perspectives belong to the orientation metaphor, particularly the influence of spatial location on consumer perceptions (up, down, left, and right). The orientation metaphor is a fundamental figure of speech. Nevertheless, other frequent metaphorical patterns exist, such as the structural metaphor. Lakoff and Johnson [25] noted that structural metaphors are a rich resource for expanding the meaning of abstract concepts. They permit us to construct one concept in terms of another highly structured and clearly defined concept. In contrast to previous research [72,73], our study employed distinct metaphorical ontologies and objects, which may be instructive for future consumer perception research.

This study also expanded the scope of "embodiment" in embodied cognition and found for the first time that "complexity", a perceptual characteristic rooted in bodily experience, also influences individual cognition. Embodied cognition research emphasizes the body as an entry point for examining the cognitive effects of various bodily experiences [74]. Existing research has primarily examined the effects of temperature [75,76] and motor characteristics [77] on individual cognition. However, people's physical experiences in real life are extraordinarily diverse. This study demonstrates that simplicity and complexity, which originate from the body's perceptual experience, influence consumers' attitudes toward

and propensity to purchase low-fat foods. In conclusion, the present study could inform future research in embodied cognition.

## 5.2. Practical Contributions

This research contributes to the fields of marketing and design in terms of their practical importance.

### 5.2.1. Marketing Inspiration

In his Nobel lecture, Fogel argued that since the perspectives of medicine and economics are independent and complementary, the union of the two is essential to the study of health issues [3]. Furthermore, the study of the obesity epidemic requires a multidisciplinary approach involving medicine, biology, food science, sociology, and economics. This study contributes from the perspective of food and economics. Furthermore, consumers' willingness to purchase food and their satisfaction with sustainable products may vary depending on the level of packaging [78,79]. Previous research has demonstrated that consumers frequently evaluate products based on their packaging design [42], and research on packaging design in the marketing field has been expanded [80]. For example, the color saturation of packaging has been found to influence consumer perceptions of health significantly [31]. This study found that consumers prefer simple packaging over visually complex packaging for low-fat foods. We confirmed that the mechanism underlying this preference is that consumers intuitively associate "simple" with the concept of fat reduction. This connection with "less" has significant practical implications for the packaging and marketing of low-fat foods due to its smoothing effect. Future businesses producing this type of food should consider selecting packaging with a low level of complexity; this will make it easier to win consumers' favor and purchase intention, as well as improve their evaluation of the company's products [81], thereby enhancing the company's reputation.

### 5.2.2. Design Inspiration

This study provides future designers with suggestions for producing more rational designs. In addition to colors, as identified in previous studies [82–84], brand identity [85], size [86], shape [84], and label [87], among other factors, can help designers grasp the overall rhythm of packaging design for low-fat foods while decreasing design cost, enhancing the sensory experience of consumers and the added value of products, and enhancing the consumption experience of users.

## 6. Limitations

This study did not investigate the influence of packaging color on consumers' propensity to purchase products. However, the aesthetics and likeability scores for each experimental material were adjusted to control for this; consequently, it is reasonable to anticipate this effect. In prior research, complexity was separated into various dimensions and attributes. In the current study, experimental materials were designed according to the six general principles of distinguishing simplicity from complexity established by Pieters et al. [35]: the number of objects, the details of objects, the dissimilarity of objects, and the irregular arrangement of objects. In addition, although there were some differences in the complexity of packaging design in this study, future research should make a more significant distinction between complex and simple packaging.

Additionally, the individual characteristics of consumers are likely to moderate the effect of the packaging complexity of low-fat foods on consumer attitudes, a topic worthy of further study. Prior research has demonstrated that the level of consumer knowledge influences their preferences for food packaging with varying degrees of saturation [31]. Consequently, consumers' preferences for the packaging complexity of low-fat foods are likely to be influenced by the consumers' characteristics. Future research may conduct additional analyses of the characteristics of consumers.

Lastly, considering that the sample used in the current study was mainly young people from Chinese urban citizens, the conclusions of the current study may not be applicable to other countries and regions or other age groups. Future research could examine whether individuals from different regions, cultures, or age groups show similar patterns.

## 7. Conclusions

Today, the demand for healthy and ethical food is on the rise around the world, especially among the emerging middle class in the Asia Pacific region who are looking for healthier, safer, and greener food options; choosing the right food packaging can convey the idea of a healthier, greener food concept. Chinese consumers are increasingly aware of the relationship between diet and health, and with this comes the popularity of low-fat foods among consumers. Millennials who are choosing to live a healthier lifestyle will pay more attention to the informational and visual cues on the packaging when making food decisions. This study investigates the impact of the complexity of low-fat food packaging on Chinese consumers. More specifically, our study shows that simple packaging is more likely to encourage consumers to purchase these products when compared to more complex low-fat food packaging. Conceptual fluency has a significant predictive effect on brand attitude and purchase intention, while brand attitude has a significant predictive effect on purchase intention. Therefore, conceptual fluency and brand attitude sequentially mediated the relationship between packaging complexity and purchase intention. Consumers' intention to buy a product is dominated by the fluidity of the cognitive process and the impression they have of the brand.

The conclusions provide important insights into food packaging design and marketing communication strategies. For designers, less fancy designs on packaging and simpler designs that are more suitable for low-fat foods help set the overall tone of the design. In addition, when packaging is designed with packaging design features that stimulate conceptual fluency among consumers, it enhances the effect of conceptual metaphors and serves to increase consumer attitudes and purchase intentions towards the brand. For example, Deliza and MacFie [88] showed that an orange box made consumers expect passion fruit juice to be sweeter and less sharp, refreshing, and liked than a white box. Then, it was found that a dairy dessert in a yellow packaging was expected to be sweeter, creamier, and more liked than the same dessert in a black packaging [82]. The authors show that location of the product image on a package facade influences consumers' perceptions of the visual heaviness of the product and evaluations of the package. The "heavier" ("lighter") locations are on the bottom (top), right (left), and bottom-right (top-left) of the package. For products for which heaviness is considered a positive attribute, packages with the product image placed at heavy locations are preferred, whereas for products for which heaviness is considered a negative attribute, packages using light locations are preferred [89]. These studies are about discussing how to stimulate consumers' handling fluency for specific packaging and provide design strategies for specific food products, based on their knowledge of food characteristics. Therefore, when it comes to packaging design for low-fat foods, simple and intuitive packaging design will increase consumers' willingness to buy, thereby reducing the environmental damage and pollution caused by unhealthy substances (trans fats, etc.) and contributing to a socially sustainable consumption culture.

For companies, managers should pay more attention to the importance of visual merchandising. When choosing packaging for low-fat food products, the use of simpler packaging is likely to cause consumers a higher willingness to buy and bring higher benefits to the company. It is also important to consider the impact of packaging features on consumer attitudes towards the brand, and to pay attention to strategic planning when marketers are marketing to create an image that suits this brand, thus creating a specific consumer attitude towards the brand. Therefore, this study can provide some strategic reference for corporate brand positioning.

Of course, consumer attitudes are influenced not only by the complexity of the packaging, but also by factors such as the color, size, and shape of the packaging [4,90,91], and

companies and designers need to combine more factors to ensure that they design product packaging that produce positive market outcomes.

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