

Aesthetic quality of product display images on fresh e-commerce platforms Research on the Impact of Consumer Trust

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Abstract. The competition in the fresh e-commerce market is becoming increasingly fierce, and merchants are using carefully designed and beautified images for promotional displays. Although this practice attracts consumers and increases sales, improper use is suspected of false advertising and can easily trigger a crisis of consumer trust. This approach not only causes inconvenience to consumers, but also has a negative impact on industry operations and reputation. Based on this, this study starts from the perspective of fresh e-commerce display images, investigates the impact mechanism of aesthetic quality on consumers' perceived value and perceived risk, and ultimately how it affects consumer trust. On this basis, the moderating variable of product involvement was introduced to verify its boundary effect between the aesthetic quality of fresh e-commerce display graphics and consumer trust. On the one hand, this article can enrich the research theories related to product images and visual marketing on e-commerce web pages; On the other hand, it also provides scientific practical advice and guidance value for fresh food e-commerce enterprises on how to correctly choose and handle product images, ensuring the success of fresh product e-commerce.

Keywords: Fresh food e-commerce; Aesthetic quality of images; Perceived value; Perceived risk; Consumer trust; Product involvement.

1. Introduction

In recent years, fresh food e-commerce has developed rapidly and become an important channel for consumers to obtain fresh food. The transformation of consumer attitudes and offline channel issues provide opportunities for their development; The fast-paced lifestyle and instant delivery of fresh produce through e-commerce can save time and energy. According to data from "Dian shu bao", the scale of domestic fresh food e-commerce transactions has continued to grow in recent years. In 2024, the user base was 577 million, a year-on-year increase of 12.47%, and the enterprise scale was 26568, a year-on-year increase of 0.95%. However, complaints about fresh food e-commerce are frequent due to the characteristics of their products such as high demand, fragility, and timeliness. Common issues include poor packaging, spoilage, and discrepancies between the actual product and the promotion. According to data from "Dian shu bao", product quality and false promotions are the main types of complaints in 2024. Fresh e-commerce platforms enhance the attractiveness of their covers and improve the aesthetic quality of their images, which affects purchasing decisions and is an important tool for increasing sales. In market competition, excessive beautification is common, leading to consumer distress and poor shopping experience. This is one of the reasons for frequent complaints, and how to deal with it is a common topic in academia and business.

The design of product images on web pages greatly influences consumers' preferences for online shopping platforms and products, and the visual features of products significantly affect purchasing behavior during online shopping [1]. As a direct sensory medium, product display images convey information more effectively than text [2], highlighting product information and reducing browsing time and energy. Consumers can obtain various information about products through fresh product display charts to determine whether they meet expectations. Existing research has focused more on web aesthetic design and less on the impact of product image features [3]. The influence of image aesthetic quality on user perception and behavioral decision-making needs further investigation.



Moreover, there is limited research on the trust mechanism of product display images in specific e-commerce industries, and there is no consensus on the impact of aesthetic quality of fresh e-commerce display images on consumer perception, evaluation, and trust. Fresh e-commerce has its own unique characteristics. In addition to beautification, its display images should also consider authenticity, convey effective information, balance demand and risk, and create a healthy industry atmosphere.

2. Literature Review

2.1. Aesthetic Quality of Images

The aesthetic quality of images is a hot research topic in the field of computer vision, and its evaluation is to assess the quality of images from a subjective aesthetic perspective. Datta et al. proposed the characteristics of aesthetic attributes such as exposure and color, as well as the three-part rule, and the depth of field to measure the degree of composition and subject prominence [4]; Ke et al. described the aesthetic properties of images from the perspective of simplicity [5]. Due to the increase in the number of images and the development of computer vision technology, most research has focused on computer simulation of human thinking and aesthetic judgment of image value [6], which has important applications in fields such as image retrieval.

There are two main directions for image research in the e-commerce field: one is related to web design, studying the impact of image placement on overall visual expression on web pages [7-9]; The second is to compare the differences in content and usage effects between images and text information [10-13]. However, few studies have focused on the aesthetic quality of e-commerce product images: Liu Rong et al. analyzed the methods and application significance of extracting visual and content features from images [14]; Ye Xuhong et al. found that the symmetry and complexity of product images have a significant impact on user emotions and attention. Color plays a prominent role in visual perception [15], and in the e-commerce field, the aesthetic quality of images affects consumer decision-making. Therefore, it is worth exploring consumers' perception and evaluation of product display images with different aesthetic levels, as well as whether they pay for them.

2.2. Consumer Trust

In the e-commerce environment, trust is a key factor, as consumers face the risk of "non face to face contact", and trust plays a significant role in overcoming perceived risks and uncertainties. Gefen believes that trust in e-commerce is the willingness of one party to rely on the other party's square and equal characteristics [16]; McKnight believes that it is composed of trust beliefs and trust motivation. Trust beliefs predict trust motivation, and meeting expectations enhances trust motivation and generates purchasing behavior [17]. Although there is no unified interpretation of the concept of trust in the academic community, many scholars believe that it is a multidimensional construct. There are a wide range of factors that affect consumer trust, including enterprise, website, consumer, and institutional characteristics [18-20]. When consumers purchase fresh agricultural products online, they have a high sense of uncertainty and risk perception in the "non face to face" environment [21], which can lead to unstable user experience and lack of trust [22]. This study will investigate the impact of aesthetic quality of product images on consumers' perceived value and risk from the perspectives of website and consumer characteristics, thereby affecting consumer trust.

2.3. Perceived Value

The definition of perceived value is broad and can be defined in terms of currency, quality, returns, etc. [22]. From a monetary perspective, it is the difference between the highest price consumers are willing to pay and the actual price they pay; From a quality perspective, it refers to the difference between the actual payment price and the perceived product quality; From the perspective of benefits, it is an overall evaluation of benefits and sacrifices. Sweeney and Soutar proposed a four-dimensional model of perceived value (functional, emotional, social value, and perceived cost) for durable goods, supplementing and expanding theoretical research [23]. Liu Li et al. classified customer perceived

value into functional, social, emotional, and procedural values in the e-commerce environment [24]. Fresh products are mostly practical products, and consumers are more concerned about functional value. Therefore, this study selects the quality part that is easy to distinguish from the product display image in perceived value, and refines it into internal and external quality [22]. The internal quality of fruits refers to nutritional value and safety, while the external quality refers to appearance, color, taste, etc. If a company allows consumers to feel good fruit quality, it may gain their trust and recognition.

2.4. Perceived Risk

The term risk originated in the fields of economics and decision science, usually referring to the probability of negative events occurring, and can be divided into subjective and objective risks. In 1960, Bauer proposed the theory of perceived risk, which pointed out that uncertainty in shopping can cause consumers to perceive risk, and perceived risk focuses on consumers' subjective cognitive risk. Cunningham's definition [25] is widely accepted by scholars, who divide perceived risk into two factors: uncertainty and consequences. The more consumers pay attention to negative content, the higher the perceived risk [26]. Since Cunningham proposed the two components of perceived risk in 1967, this concept has become the mainstream of subsequent research. NenaLim defines perceived risk in e-commerce shopping as the degree to which consumers believe they may suffer losses when purchasing products or services online [27]. Stone et al. believed that

perceived risk is the expectation of loss, and the higher the expectation, the greater the risk perceived by consumers [28]. This viewpoint is more applicable to the study of consumers browsing fresh e-commerce websites. This article will adopt the viewpoint of Stone et al. and define the perceived risk of fresh food e-commerce consumers as their subjective expectations of the possible consequences of their purchasing behavior while browsing fresh food e-commerce websites.

2.5. Product involvement

At present, the academic understanding of product involvement is mainly based on product attributes and self-perception perspectives, with the former dividing product categories and the latter dividing consumer groups.

From the perspective of product attributes, consumers' brains generate corresponding levels of involvement when purchasing products or services. For example, cars have a higher level of involvement for most consumers, while beverages, tissues, etc. have a lower level of involvement [29]. Traylor believes that non-durable consumer goods are often classified as low involvement products, while durable goods are mostly high involvement products [30], and theoretically products can be classified accordingly. From the perspective of self-awareness, according to Zaichkowski's definition, product involvement exists due to differences in consumers' physical and mental needs, reflecting their association and level of importance with the product [31]. Scholars believe that consumers can be divided into two categories based on their level of product involvement: low and high involvement. High involvement consumers are more active in searching for information and making rational decisions when making purchases [32]; Low involvement individuals have less information and are unwilling to think and compare, and their decisions are often influenced by emotions [33].

This study draws on Zaichkowski's definition and believes that involvement refers to the degree to which an individual considers a product important to themselves and in line with their values. It will explore the differences in consumers' perception and evaluation of the aesthetic quality of fresh e-commerce display images with different levels of involvement, as well as their impact on consumer trust.

3. Research Hypothesis

3.1. Aesthetic Quality of Images and Consumer Trust

With the popularization of the Internet and the improvement of logistics level, fresh food sellers have expanded online channels, and the homogenization competition of fresh food e-commerce has intensified. Offline shopping allows consumers to observe products up close, while online shopping is limited by time and space, and can only understand products through the graphics and text displayed by merchants. Images are intuitive and stimulating, while text supplements explanations. If the images and text are not authentic, it will affect consumers' judgment of the authenticity of the product [34]. In the digital age, e-commerce workers often beautify photos by adjusting image parameters, adding or reducing brightness, and other operations. Over beautification is a common phenomenon, which increases the attractiveness of fresh products but can cause confusion for consumers. High aesthetic quality and distortion of images can lead to a crisis of trust and increase trust costs [35]. This study suggests that excessive beautification of product images is an important factor leading to consumer trust crisis, and therefore proposes a hypothesis:

H1: The aesthetic quality of fresh product images has a significant negative impact on consumer trust

3.2. The positive impact of aesthetic quality on consumer trust: the mediating role of perceived value

To explore the intrinsic mechanism by which aesthetic quality affects consumer trust, this study proposes two paths. Firstly, it discusses the positive impact of aesthetic quality on consumer trust - the mediating role of perceived value.

From aesthetic quality to perceived value: Zeithaml (1988) defined consumers' evaluation of product utility as perceived value. C. Keen (2004) believes that the perceived value of online consumers comes from the product information and services provided by sellers. The triangular model constructed by Naumann (1995) shows that perceived value is reflected in three aspects: perceived product quality, service quality, and price. Dubinsky (2003) found that perceived product quality has a significant impact on perceived value in online consumption. In e-commerce design, product display images are an important channel for consumers to obtain information, which can compensate for the lack of sensory experience in online shopping and improve perceived evaluation [36]. Color has artistic appeal in design

[15], improving the aesthetic quality of fresh product display images, allowing consumers to gain visual enjoyment, associate product value, and enhance positive evaluation and perceived value [37]. Therefore, the higher the aesthetic quality of fresh e-commerce display images, the higher the perceived value of consumers.

Perceived value to consumer trust: Trust is the recognition of a merchant's products and services by consumers, reflecting confidence in the merchant's future behavior [38]. Perceived value is an important influencing factor of consumer trust, and consumer perception of product quality has a promoting effect on trust tendency [22, 39]. Consumers who perceive the high functional value of a product will increase their favorability towards the merchant or brand, thereby enhancing their trust.

The perceived value of fresh e-commerce products in this article refers to the comprehensive evaluation of the perceived internal and external quality of the product by consumers after browsing the display image. If the fruits sold by merchants make consumers feel better quality, they may gain trust and recognition. In summary, hypotheses are proposed:

H2: Perceived value plays a mediating role between the aesthetic quality of fresh e-commerce display images and consumer trust.

3.3. Negative impact of aesthetic quality on consumer trust: mediating role of perceived risk

In hypothesis H1, it is proposed that the aesthetic quality of fresh product images significantly negatively affects consumer trust. Although the improvement of aesthetic quality promotes consumer trust through perceived value, it is limited and weak. Next, we will discuss the negative impact of aesthetic quality on consumer trust from another perspective - the mediating role of perceived risk.

Aesthetic quality to perceived risk: Cunningham categorizes perceived risk into two factors: uncertainty and consequences, relying on consumers' subjective judgments [25]. In the context of e-commerce, Dong Dahai et al. believe that perceived risk in online shopping is a subjective prediction by consumers of the likelihood and severity of adverse consequences [40]. When shopping online, product display images are an important way for consumers to understand the appearance of products. Beautified fresh display images interfere with consumers' accurate evaluation, and merchants conceal product defects or even false advertising, making it difficult for consumers to effectively judge the quality of products and increasing uncertainty. Fresh food has strong timeliness, high transportation costs, and difficult returns and exchanges. If consumers fail online shopping, they will have to bear the losses themselves. The lack of after-sales support will exacerbate their consideration and vigilance towards adverse consequences. Therefore, the higher the aesthetic quality of fresh e-commerce display images, the

higher the perceived risk for consumers.

Perceived risk to consumer trust: Perceived risk is the consumer's perception of the negative consequences and possibilities of purchasing behavior, which is the reason that affects the realization of transactions. When shopping online, consumers have limited communication with merchants and perceive greater risks than in physical stores. Risk averse consumers rarely shop online [41], and perceived risk has a negative impact on their attitudes and behavioral intentions towards online shopping. Scholars generally believe that there is a negative relationship between perceived risk and consumer trust [42], and uncertain factors in transactions can hinder the generation of trust [43]. Therefore, the higher the perceived risk, the lower the level of consumer trust.

The improvement of aesthetic quality will make consumers doubt the information on fresh food websites, increase perceived risks, and thus reduce trust. In summary, hypotheses are proposed:

H3: Perceived risk plays a mediating role between the aesthetic quality of display images in fresh e-commerce and consumer trust.

3.4. The regulatory effect of product involvement

The differences in consumer product involvement stem from product attributes, consumer characteristics, and perceived differences. Product involvement reflects the degree of association and attention between consumers and products, reflected in the differences in time and energy spent searching and processing information. Different levels of involvement can trigger different search motivations and information processing processes [44]. Low involvement consumers do not actively search for information, conduct in-depth analysis and comparison, and make complex decisions without careful consideration [33]; When the level of involvement increases, consumers will spend more time and energy choosing products, striving to increase their awareness of the products [45].

In the context of low product involvement, consumers have less shopping time in the early stage, have less information, rely on product images and text to judge product value, and are prone to one-sided consideration. Improving the aesthetic quality of display images can easily persuade them to enhance their perceived value, while ignoring risks. Perceived value increases with the improvement of the aesthetic quality of display images. In the context of high product involvement, consumers do not rely on merchant information and will invest energy in searching for information, pay attention to post purchase risks, and avoid risks through various means. The perceived risk increases with the improvement of the aesthetic quality of the display image.

Based on this, a hypothesis is proposed:

H4a: Product involvement negatively regulates the relationship between aesthetic quality of fresh e-commerce display graphics and perceived value. At low involvement levels, the indirect effect of perceived value is stronger.

H4b: Product involvement positively moderates the relationship between aesthetic quality of fresh e-commerce display graphics and perceived risk. At high levels of involvement, the indirect effect of perceived risk is stronger.

3.5. Research Model

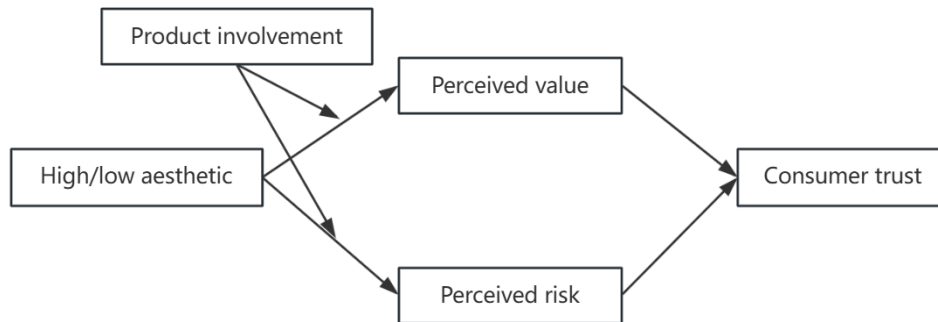


Figure 1. Research Model

4. Research Design

4.1. Preparation of experimental materials

To explore the impact of aesthetic quality of product images on consumer trust, we chose fruit product images as the main stimulating material for two reasons: firstly, as a common fresh food, fruits have a high purchase rate and familiarity among student groups; The second is that fruits are well-known to the public, making it easy to measure the differences in perceived internal quality (nutritional value, safety), external quality (shape, color, taste), and perceived risk under different levels of beautification.

We have collected four pairs of fruit product display images from fresh e-commerce platforms such as Taobao and Mei tuan You xuan. Each pair of fruits has the same type, similar content and layout, but there are differences in aesthetic quality in color, detail, brightness, and other aspects. Considering the subjectivity of evaluating the aesthetic quality of images, we consulted with teachers and classmates and

selected two pairs of images to be classified into high and low aesthetic quality groups, respectively. Finally, we obtained two sets of fruit e-commerce product display images with different aesthetic qualities (as shown in Fig. 2). On this basis, to ensure the effectiveness of the stimulus material, we conducted a pre-test experiment in advance to detect whether there were significant differences in the categorical independent variables. 20 students were invited to evaluate the aesthetic quality perception of two sets of fruit display images.



Figure 2-1. Low aesthetic quality group



Figure 2-2. High aesthetic quality group

4.2. Research variable measurement items

This study used a 7-level Likert scale. The measurement indicators for perceived value of fruits are adapted from Lin Jiabao et al [22], perceived risk adapted from Ye Naiyi [46], Stone et al. [28], consumer trust adapted from Lin Jiabao et al. [22], Pan Yu et al. [47], product involvement adapted from Yang Wen'e [48], Zhang Hongmei et al. [49], Gursoy et al. [50]. Finally, a formal scale was formed.

4.3. Sample selection, distribution, and investigation

This study selected fruits as fresh stimulating materials, and online shopping for fruits is more common among college students. The research hypothesis variable focuses on consumers' subjective perception. College students have strong acceptance, can accurately express subjective perception and willingness, and have independent consumption ability. Therefore, selecting college students as the main research subjects, taking into account the convenience and rationality of sample acquisition.

5. Empirical and Testing of Models

5.1. Descriptive statistical analysis

There were 163 valid questionnaires in this survey. Among the survey participants, females accounted for 61.35% and males accounted for 38.65%. The age group is mainly concentrated between 21-30 years old, accounting for 65.64% of the total sample, and users aged 20 and below account for 33.74%. In the survey, 134 consumers (82.21%) have browsed fresh food e-commerce websites, of which 112 consumers (68.71%) have purchased fresh food using fresh food e-commerce websites, and 22 consumers (13.50%) have not purchased fresh food online through online fresh food platforms but have browsed related platform websites. Another 29 consumers (17.79%) have neither used online fresh food platforms to shop for fresh food nor browsed related platform websites. However, they have browsed real examples of fresh food e-commerce display images in the questionnaire, which has created real-time stimulation for consumers and excluded the influence of other factors such as prices, textual descriptions, and online reviews on consumers' perception on online fresh food platforms. Therefore, it is also an effective source of the questionnaire.

5.2. Reliability test

This study used SPSS 26.0 software to conduct statistical analysis on the data obtained from the formal survey, and tested the reliability of four measurement scales, namely product involvement, perceived value, perceived risk, and consumer trust, for online fruit shopping. The results showed that the Cronbach Alpha reliability coefficients of the scales were all above 0.8, indicating that the measurement scale reliability of this study questionnaire was very high. The specific inspection results are shown in Table 1.

Table 1. Cronbach Alpha reliability coefficient test results

variable name	Measurement items	Cronbach' Alpha	Cronbach' Alpha
Product involvement	8	0.811	0.840
perceived value	6	0.912	
perceived risk	6	0.856	
Consumer trust	4	0.923	

5.3. Validity testing

Since the measurement items are all adapted from existing literature research, it can be considered that the content validity of this research questionnaire is good. To test the structural validity of the questionnaire using factor analysis, KMO and Bartlett's sphericity tests need to be performed on the data. The test results are shown in Table 2.

Table 2. Results of Variable KMO Measurement and Bartlett's Sphere Test

variable name	KMO measurement	Bartlett sphere test		
		approximate chi- square	f	Sig.
perceived value	0.855	639.621	15	0.000
perceived risk	0.803	548.164	15	0.000
Consumer trust	0.807	500.956	6	0.000
overall	0.796	1882.485	120	0.000

The KMO measurement and Bartlett's sphericity test results in Table 2 show that the KMO measurement value of the sample reaches 0.796, and the KMO measurement of each variable is above 0.8. The significance level of Bartlett's sphericity test is 0, indicating that the sample is suitable for factor analysis. The results of factor analysis are shown in Table 3.

Table 3. Explanation of Total Variance in Factor Analysis

Initial eigenvalue				Extract the sum of squared loads			Sum of squared rotational loads		
ingredient	total	Variance percentage	Accumulated%	total	Variance percentage	Accumulated%	total	Variance percentage	Accumulated%
1	4.962	31.012	31.012	4.962	31.012	31.012	4.252	26.574	26.574
2	4.458	27.864	58.876	4.458	27.864	58.876	3.310	20.686	47.259
3	1.828	11.424	70.299	1.828	11.424	70.299	2.510	15.687	62.946
4	1.098	6.862	77.162	1.098	6.862	77.162	2.274	14.215	77.162
5	0.592	3.701	80.863						
6	0.479	2.992	83.855						

Extraction method: Principal Component Analysis.

The results in Table 3 show that the cumulative variance explanation rate of the four extracted factors with eigenvalues greater than 1 is 77.162%, which is higher than the commonly used standard of 60%. This indicates that the explanatory power of the extracted factors for the original variables is still acceptable. Test the loading size of each variable on the extracted factors, and the test results are shown in Table 4.

Table 4. Component Matrix after Rotation

		ingredient			
		1	2	3	4
perceived value	Intrinsic Value 1	0.813	0.182	0.006	0.091
	Intrinsic Value 2	0.866	0.096	0.072	-0.029
	External Value 1	0.806	0.124	0.007	-0.141
	External Value 2	0.819	0.070	0.151	-0.045
	Comprehensive evaluation 1	0.780	0.018	0.129	0.256
	Comprehensive evaluation 2	0.842	0.185	0.173	-0.080
perceived risk	Product unreliability risk 1	0.085	-0.151	0.879	0.253
	Product unreliability risk 2	0.101	-0.140	0.909	0.178
	Product unreliability risk 3	0.248	-0.044	0.781	0.282
	Store unreliability risk 1	-0.079	-0.019	0.135	0.860
	Store unreliability risk 2	0.029	-0.228	0.272	0.804
	Psychological risk	0.049	-0.191	0.299	0.744
Consumer trust	Trust 1	0.034	0.884	-0.124	-0.171
	Trust 2	0.148	0.891	-0.022	-0.088
	Trust 3	0.270	0.852	-0.078	-0.048
	Trust 4	0.137	0.882	-0.149	-0.133

Extraction method: Principal Component Analysis. Rotation method: Caesar normalization maximum variance method. The rotation has converged after 5 iterations.

Observing the factor loading values of each measurement item in the rotated component matrix obtained from factor analysis in Table 4, it was found that perceived value has explanatory power for factor 1, consumer trust has explanatory power for factor 2, and perceived risk has explanatory power for both factor 3 and factor 4. And the loadings of each factor are all greater than 0.7, indicating that the scale data has good convergent validity and discriminant validity, and the questionnaire has good structural validity.

5.4. Main effect test

This study used one-way analysis of variance to examine the impact of aesthetic quality of fresh e-commerce display graphics on consumer trust. The results are shown in Table 5. There is a significant difference in consumer trust scores between the two scenarios, and the score is higher in the low aesthetic quality scenario ($F=19.799$, M low aesthetic quality= $4.63 > M$ high aesthetic quality= 4.01), $P=0 < 0.05$). Therefore, this article assumes that H1 is validated and that the aesthetic quality of fresh product images significantly negatively affects consumer trust.

Table 5-1. Inter group Statistics

group	Number of cases	Mean Consumer Trust	Standard deviation	Standard error
Low aesthetic quality	81	4.629	0.891	0.099
High aesthetic quality	82	4.009	0.889	0.098
total	163	4.317	0.940	0.074

Table 5-2. Single factor ANOVA analysis

	sum of squares	degree of freedom	mean square	F	Sig.
Inter group	15.688	1	15.688	19.799	0.000
Within group	127.570	161	0.792		
total	143.258	162			

5.5. Mediation Effect Test

5.5.1. Testing the mediating effect of perceived value.

This study used Bootstrap method to test the mediating effect, and the analysis results showed that perceived value mediated the impact of aesthetic quality of fresh display images on consumer trust ($\beta=0.12885$; CI=0.00697 to 0.3343) (as shown in Fig. 3), and hypothesis H2 was validated.

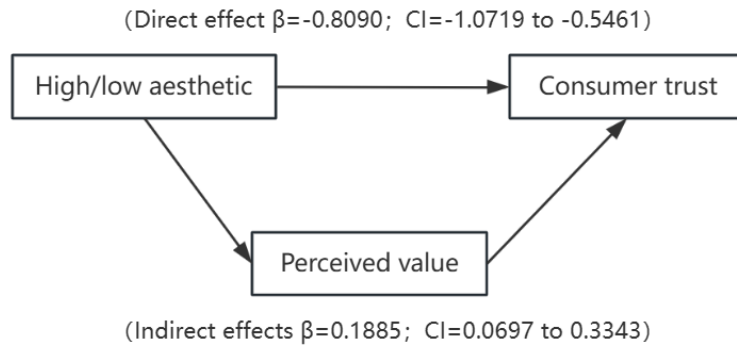


Figure 3. Mediating effect of perceived value

5.5.2. Testing the mediating effect of perceived risk.

To further examine the mediating effect and significance of perceived risk, the Bootstrap method will continue to be used. The analysis results indicate that perceived risk also mediates the impact of the degree of beautification of fresh food display graphics on consumer trust ($\beta=-0.1331$; CI=0.2675 to 0.0384) (as shown in Fig. 4), thus hypothesis H3 is also validated.

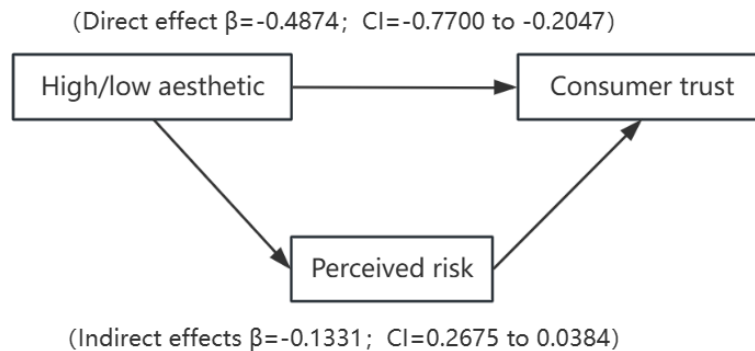


Figure 4. Mediating effect of perceived risk

5.5.3. Double mediation effect test of perceived value and perceived risk.

In order to further test the model of this dual mediator variable, while placing perceived value and perceived risk separately into the mediator variables, the Bootstrap method will continue to be used. The confidence intervals of the test results in Table 6 do not include 0. From this, it can be seen that the internal mechanisms underlying the impact of perceived value and perceived risk on consumer trust in the aesthetic quality of fresh e-commerce display graphics are different. However, this dual mediation model still holds, and the indirect effects between perceived value and perceived risk are significantly different.

Table 6. Test results of double mediating effect

	Effect	SE	LLCI	ULCI
total effect	-0.6205	0.1394	-0.8959	-0.3451
direct effect	-0.6683	0.1338	-0.9325	-0.4042
Indirect effects of perceived value	0.1967	0.0678	0.0744	0.3356
Indirect effects of perceived risk	-0.1488	0.0589	-0.2793	-0.0509
Comparison of indirect effects (Perceived Risk Perceived Value)	-0.3455	0.0920	-0.5688	-0.1967

5.6. Regulation effect of product involvement

Fresh products belong to daily consumer goods, and consumers are generally familiar with their attributes. The single purchase cost and risk are low, and there is no need to spend too much energy when purchasing, resulting in relatively low involvement. At this time, it is difficult to manipulate the participants' involvement in fresh products and is greatly influenced by accidental factors. Therefore, this article did not use manipulation to test the moderating effect of product involvement. Instead, the research subjects' product involvement was divided into high and low groups based on the mean, and two relative samples were obtained. Eight items were used to measure the level of involvement, with an overall mean of 5.15 and a standard deviation of 0.92. Based on this, the data were grouped into 79 groups with low involvement and 84 groups with high involvement. SPSS one-way ANOVA showed a significant difference in the mean between the two groups.

Firstly, we conducted a two-factor analysis of variance to examine the interaction between product involvement and aesthetic quality on perceived value and perceived risk.

The interaction between product involvement and aesthetic quality on perceived value: Using perceived value as the dependent variable and product involvement and aesthetic quality as fixed factors, a two-factor analysis of variance was conducted to obtain Table 7. The results show that the interaction between aesthetic quality and product involvement has no significant impact on consumers' perceived value.

Table 7. Two factor analysis of variance on the interaction between product involvement and aesthetic quality on perceived value

	F	Sig.
Aesthetic quality	11.998	0.001
Product involvement	8.727	0.004
Aesthetic quality * Product involvement	0.397	0.529

Note: R-squared=0.118 (adjusted R-squared=0.102)

The impact of the interaction between product involvement and aesthetic quality on perceived risk: Using perceived risk as the dependent variable and product involvement and aesthetic quality as fixed factors, a two-factor analysis of variance was conducted to obtain Table 8. The results show that the interaction between aesthetic quality and product involvement significantly affects consumers' perceived risk.

Table 8. Two factor analysis of variance on the interaction between product involvement and aesthetic quality on perceived risk

	F	Sig.
Aesthetic quality	17.219	0.000
Product involvement	7.242	0.008
Aesthetic quality * Product involvement	6.091	0.015

Note: R-squared=0.118 (adjusted R-squared=0.102)

6. Results Discussion

6.1. Main Effect Results

The main effect test shows that the degree of beautification of display images in fresh e-commerce has a significant negative impact on consumer trust. There are two reasons: firstly, the homogenization competition in fresh food e-commerce has intensified, and methods to improve the aesthetic quality of display images have been widely imitated. Consumers are accustomed to this and often have unpleasant shopping experiences due to false advertising, losing industry confidence. The perceived risks brought by the improvement of aesthetic quality outweigh the perceived value,

leading to consumer distrust; Secondly, the public has a high level of awareness of fresh products, and their purchases tend to be rational. Display images are not the only reference for decision-making, and they are not easily misled by aesthetic quality. However, they are prone to dislike excessive beautification, which can trigger a crisis of trust.

6.2. Mediation Effect Results

The mediating effect shows that perceived risk and perceived value play a mediating role between the aesthetic quality of display images in fresh e-commerce and consumer trust. The aesthetic quality of display images has a "double-edged effect" on consumer trust, which is both negatively affected by perceived risk and positively affected by perceived value. On fresh food e-commerce platforms, display images are an important channel for businesses and consumers to communicate and understand product information. Beautify display graphics to enhance page aesthetics and readability, optimize product image, increase consumers' perceived value of fresh products, and promote trust. However, when shopping online, consumers cannot observe products up close and can only judge their quality through display images. For the fresh e-commerce industry with varying quality, display images have a significant impact. If the display image is overly beautified, it will increase purchasing uncertainty, and industry complaints will occur frequently. Uncertainty is risk, and perceived risk increases, naturally reducing consumer trust.

6.3. Regulatory Effect Results

As mentioned earlier, product involvement positively moderates the relationship between aesthetic quality of display images and perceived risk in fresh e-commerce, but its moderating effect on the relationship between aesthetic quality of display images and perceived value is not significant. The reasons for this are as follows:

Consumer perspective: Perceived risk relies on subjective judgment, high involvement consumers are more cautious in evaluating information, and there are greater risk concerns when the aesthetic quality of the display image is high; Consumers with low involvement tend to be perceived as deceptive and have low risk concerns when evaluating high-quality aesthetic displays through simple clues. Dholakia's research supports this inference that low involvement consumers may not perceive product risk, therefore product involvement positively moderates the relationship between aesthetic quality of display graphics and perceived risk. At low levels of involvement, consumers ignore value perception or pay more attention to risk, resulting in insignificant differences in perceived value and insignificant negative moderating effects at different levels of involvement. This is in line with the dual path model theory, where high involvement initiates the central pathway and has a significant impact on risk perception; Low involvement initiates the edge path, making it difficult to enhance perceived value.

From the perspective of fresh products: Fresh products are daily consumer goods, and consumers have rich knowledge reserves and purchasing experience. Low involvement consumers also understand product indicators and do not blindly rely on the aesthetic quality of display graphics, so the negative moderating effect is not significant.

Industry perspective: The competition in fresh food e-commerce is fierce, and the beautification and display of images attract attention. At the same time, complaints are frequent, causing consumers to lose confidence. Consumers with high involvement are more cautious in avoiding risks, and the perceived risk brought by the improvement of aesthetic quality is greater than the perceived value, so the positive moderating effect is significant.

7. Summary

At the theoretical level, in e-commerce, product display images significantly influence consumer purchasing decisions and behaviors, and examining the impact of their visual features on consumer decision-making is a key focus in this field. In the field of fresh e-commerce, product display images

have important reference value. This article focuses on this and provides a new research perspective for visual marketing and e-commerce. It innovatively applies aesthetic design to the evaluation and trust of fresh e-commerce consumers' online shopping perception, and explores the impact mechanism of the aesthetic quality of display images on consumer trust.

At the practical level, the scale of fresh e-commerce consumption has expanded, and many sellers have flooded into online sales. The research results of this article provide guidance for the design of product display images for fresh e-commerce sellers and managers: Consumer perceived value and risk are the key factors affecting their trust. The study can help designers control the aesthetic quality elements of images, understand their relationship with consumer perceived value and risk, recognize the double-edged effect of improving aesthetic quality, and then design reasonable and attractive display images that enhance customer appeal, improve image, and effectively convey information, promoting consumer trust.

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