

Research on the mechanism of emotional design in Chinese cultural and creative products

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Abstract

The empowerment of design for cultural and creative products in the digital media era is further amplified by social media platforms, its emotional and subconscious impact on users is important and profound. In addition, the integration of cultural creativity into emotional design will become an important way to enhance regional and national cultural confidence. It is easy to see that product design with unique emotional design features will become an important driver of market development, but the research on the mechanism of the role of emotional design in cultural and creative products is still not clear and explicit. The paper compares four winning entries in the Cultural and Creative Product Design Competition and four commercial products in online stores through 176 valid questionnaires. The paper uses structural equations to analyze whether these criteria are accepted by consumers and the market, and whether there is a perception gap between the two.

Background

Since the early 1990s, the global economy has shifted from an industrial era to a knowledge-based economy, and the trend towards a "beauty economy" has emerged in the early 21st century. In the field of economics, Jay [1] sees the beauty economy as a combination of tradition and modernity, culture, craft and beauty in the global market. Liu [2] points out that the rise of the knowledge economy and the beauty trend and the combination of culture and design has brought about a profitable cultural consumer market. In the study of cultural and creative products, most studies tend to describe the external characteristics of the products through their appearance, but too vague designs hardly resonate with different cultural groups in the short term [3]. Verganti [4] pointed out that the meaning of a product comes from the interaction between the user and the product. Lin Rongtai [5] argues that cultural and creative products use cultural elements as a source of creativity to meet the needs of users' spiritual dimension. Therefore, in addition to cultural elements, China's cultural and creative product design should also integrate emotions into the design so that the product can be identified with different cultural groups around the world while its ethnicity is being maintained [6].

1. Purpose Of Research

With the advent of China's post-industrial era, China's product design has changed from globalization to seeking differentiation. Relying on China's profound cultural heritage, aided by human emotional needs, will enable China's cultural and creative products to better develop the international market and spread Chinese culture at the same time [7-8]. However, overly subtle and emotional creations are difficult to resonate with different cultural groups in a short period [9-10]. With the development of the Internet, it has become imperative to strengthen China's industry, shape its brand image, and cultivate designers who are more in tune with market demand [11-12]. As Samiee [13] points out, if consumers have brand awareness, they may still have positive perceptions of unfamiliar products, so it is important to shape brand images and nurture emerging products and designers under the umbrella of branding [14].

In reviewing the past literature, the emotional design has almost always been discussed in the field of design [15-16], while the research literature related to consumer purchase intentions and preferences has also focused on the field of marketing. These two fields are different. With the development of today's market, consumers' choices of products are becoming more diverse and abundant [17]. Therefore, enterprises must adapt to the direction of market development to gain a competitive advantage. To address this research gap, this paper explores the impact of emotional design on consumers' purchase intentions and preferences. Using "preference" as a mediator, this paper explores whether the "emotional design" of creative products affects consumers' "purchase intentions" and explores the differences in recognition between past award-winning creative products and those that sell well on the Internet. Since most of the existing design evaluations focus on award-winning designs in professional fields, it is one of the objectives of this study to investigate whether the design excellence identified by consumers from non-professional backgrounds based

on their life experiences and subjective preferences differs from the criteria identified by experts and professionals, so as to understand the core elements required for good design and the design elements that meet contemporary needs, and to build a rational evaluation system for emotional design in China to meet the emotional needs of consumer groups. Moreover, this study is used to guide designers to understand the current focus of product design and integrate it into future teaching in order to cultivate design talents that better meet today's market needs and provide a reference basis for related industries to enter the beauty economy market.

2. Research Methodology

2.1 Research Process

The research focuses on exploring the differences between the consumer market demand for cultural and creative products and the award-winning results, and exploring the content and essence of cultural and creative product design. The research process is divided into four stages (see Figure 1). The first stage is the summary of literature, and the second stage is the questionnaire design. The scale composition was established through theoretical summary and analysis. The third stage is the selection and testing of the research subjects. The fourth stage argues the research hypothesis through the validation of the questionnaire results and data analysis, and finally presents conclusions and recommendations.

2.2 Research Hypothesis

The paper is based on relevant theories and mainly conducts a validation study, and its research hypotheses are mainly as follows:

1. Emotional design significantly affects consumers' purchase intention and preference in the sales of Chinese cultural and creative products.
2. Preference mediates between purchase intention and emotional design of creative products, and emotional design of products can influence consumers' preference and increase purchase intention.
3. Emotional design affects the preference and purchase intention of award-winning and best-selling products respectively.
4. Different elements of emotional design affect the preferences and purchase intentions of award-winning and best-selling products respectively.
5. There are significant differences between award-winning and best-selling products.

The following is the conceptual model of the article (see Figure 2).

2.3 Selection and testing of research objects

The article chose two types of research objects for the study, one is really commercial products on the Taobao website, and the other is the cultural and creative products that won in the competition. Eight samples were selected for the questionnaire, four commercial products and four award-winning products. The commercial products were selected from the Taobao website, and the selection criteria were as follows: 1. The products should be commonly used in daily

life; 2. The design inspiration should have Chinese cultural connotation or regional cultural connotation; 3. The sales of the selected products should be more than 1000 pieces.

The criteria for the selection of the winning products are similar: 1. The products commonly used in life are selected; 2. The design inspiration of the products should have Chinese cultural connotation or regional cultural connotation; 3. The products should have won awards in well-known competitions and achieved the ranking. (See Table 1)

2.4 Research tools

In recent decades, many scholars have proposed different models for testing emotional design. For example, Green and Jordan[18] argued that using the attractiveness of products to design pleasant products can make them seem more useful, thus proposing that product design must satisfy people's four pleasant feelings: conscious pleasure, social pleasure, physical pleasure, and psychological pleasure; Norman[19] argued that emotional design has three levels: the instinctive level, the behavioral level, and the reflective level. Khalid and Helander[20] argue that the success of a product in the market may depend on its beauty appeal, the pleasure it creates and the satisfaction it brings to the user, and that consumer needs for a product are divided into three main parts: overall impression, functional requirements and stylistic requirements, where both overall impression and stylistic requirements are related to feelings and emotions.

Hassenzahl, Amic G and Hirschman, E.C.[21-23] argued that the relationship between product beauty perception and usability is measured by the attributes of usability (utility), hedonicity (stimulation and recognition), goodness (satisfaction) and beauty. McCarthy & Wright[24] view emotion as the process by which products and services enable people to experience them, encompassing the entire experience, the senses, emotions and the broad social and cultural context and real-time usage scenarios. Anderson[25] proposed levels of product design that are practical, reliable, usable, convenient, enjoyable and meaningful. Jagtap[26] proposed product form attributes and emotional scales, arguing that product form is important in determining consumer response and product success, and that it triggers certain characteristics and emotions to help designers design their products.

From the above, it can be seen that the emotional design of a product is related to factors such as creativity, beauty, pleasure, engineering and sophistication. However, in addition to the emotional appeals of creativity and beauty, consumers usually make rational purchase decisions based on a comparison of product benefits and cost effectiveness[27]. Good product design not only captures consumers' attention and communicates with them, but also increases their willingness to buy through the experience of using it[28]. The emotional design of a product is the focus of consumer preferences and purchase intentions. Therefore, the paper lists and analyzes the emotional design models proposed by different scholars and uses them to form a preliminary scale of emotional evaluation with creativity, beauty, pleasure and engineering, and refinement as the main features (see Tables 2 and 3).

Table 2

Relevant patterns of emotional design

Scholars	Design Patterns	Measurement Elements
Green&Jordan [2002]	Pleasure experience factors	Social pleasure, Conscious pleasure, Psychological pleasure, Physical pleasure,
Norman[2004]	Emotional design factors	Instinctual level, Behavioral level, Reflective level
Khalid&Helander [2004]	Consumer demand scale	Overall impression, Functional needs, Shape needs
Hassenzahl [2004]	Usability, Hedonicity and Feeling Scale	usability (utility), hedonicity (stimulation and recognition), Kindness (satisfaction) and beauty
McCarthy&Wright [2004]	Emotional Model	Experience, Sensory, Emotion, Society and cultural environment
Anderson[2011]	Product Design Consideration Levels	Practical, Reliable, Easy to use, Convenient, Enjoyable and meaningful
Jagtap[2017]	Product styling attributes and mood scale	Innovation, beauty, harmony, elegance, joy, delight, satisfaction, interest, surprise, vitality, charm, calm, entertainment, happiness, practicality, convenience, high quality

Table 3
Structure of the first Delphi expert questionnaire

Measurement Elements	Sub-items	Evaluation Reference Source
Originality	C1 The product materials are original	Hassenzahl,2004;
	C2 The product is original or innovative	Norman,2004;
	C3The product makes people feel special	Jagtap,2017;
	C4 The product is novel	
Function	F1 The product is practical	Hassenzahl,2004;
	F2 The product is safe to operate	Norman,2004;
	F3 The product is easy to use	Jagtap,2017
beauty	A1 The product has a fashionable taste	Demirbilek&Sener,2003
	A2 The product ratio is reasonable	Hassenzahl,2004;
	A3The colors of The product are used properly	Norman,2004;
	A4 The product has detailed design	Jagtap,2017;
	A5 The product surface or surface design is exquisite	
Pleasure	P1 The product evokes people's life memories	Green&Jordan,2002
	P2 The product is attractive and enjoyable	Hassenzahl,2004;
	P3The product makes people feel satisfied	Norman,2004;Jagtap,2017
Purchase Intention	P1. Would you buy this product	Jabocy&Chesnut,1978;
	PP2. Will you buy the similar products you like when you see them	Keller,2001;
	P3. Would you buy this product if someone recommends it	Fandos&Flavian,2006
Degree of Preference	PR1. How much you like this product	

The paper explores and analyzes the relevant literature to form a preliminary questionnaire, and then explores the relationship between emotional design influencing consumer purchase intention and preference. In this paper, the results of previous literature review were coded and analyzed, and then the kj method was used to classify and name the 4 major metric elements and 15 subelements in the first round of Delphi expert questionnaire. Experts' opinions were conducted to select and evaluate the metric elements with high consensus, and the meaning descriptions of the subelements were revised according to the experts' suggestions. Through the repeated operation of the third round of expert opinions, the convergence of opinions was realized, and the measurement factors and sub-factors of creative product design were established. Finally, the product's ability to convey cultural connotation, the product's impressive appearance, and the product's fashionable taste are classified as the pleasure factor; the product's perfect proportion, the product's sense of design, and the product's pleasing appearance are classified as the beauty factor; the product's creativity, the product's storytelling, and the product's creative use of materials are classified as the creativity factor; the product's delicate workmanship, the product's exquisite structure, and the product's delicate workmanship, the product's exquisite structure, the product's sharp shape are summarized as the exquisite factors; the product's excellent

production technology, the product's sturdy and durable, the product's good operability are summarized as the engineering factor. And according to the purchase heart process, the purchase intention is divided into three levels: purchasing the product, purchasing similar products, and recommending others to purchase. Then, according to the evaluation level and model structure, the evaluation scale of emotional design factors affecting consumers' willingness to purchase and preference is developed. The questionnaire has a total of 19 assessment points with 6 major elements. Each point is mainly derived from the preliminary literature, and the elements involved in the article are constructed based on relevant theories. The feasibility of the questionnaire is tested by confirmatory factor analysis (CFA) in the later stage. The questionnaire scale is shown in Table 4.

Table 4
Formation scale after three rounds of Delphi method

Measurement Elements	Secondary Elements
Pleasure	J1. The product conveys cultural connotations
	J2. The product is impressive
	J3. The product has a sense of fashion
beautys	B1. The product has good proportions
	B2. The product has a sense of design
	B3. The product has a pleasant appearance
Originality	C1. The product is novel and unique
	C2. The product is storytelling
	C3. Creative use of product materials
Exquisite	D1. Product workmanship is very fine
	D2. Product structure is good
	D3. Product shape is sharp
Ergonomics	E1. Well-made products
	E2. Durable products
	E3. Good operability of the product
Purchase Intention	P1. Would you buy this product
	P2. Will you buy similar products you like
	P3. Would you buy this product if someone recommended
Degree of Preference	PR1. How much do you like this product

2.5 Selection and measurement of experimental subjects

Designers need to develop scales to assess whether design concepts are effectively communicated to consumers [29], and in Lindstrom and Seybold's [30] study, it is noted that the influence of young children on their parents' purchases has reached alarming levels. Since the article study focuses on a comparison study between award-winning products and

high-volume products, exploring the differences between professional and non-professional populations in terms of their emotional perceptions of the products. Therefore, the research subjects are mainly non-art college students, who are also potential consumers of the selected products. Since the research purpose of the article is mainly based on the influence of purchasing decisions and does not involve the product brand, it deliberately avoids brand awareness when choosing products, so as to be more in line with the consumption level of college students.

The article questionnaires were distributed through the "Questionnaire Star" online questionnaire. After the students agreed, the questionnaires were filled out on the Internet. In the end, 254 questionnaires were received, and 176 valid questionnaires were finally screened. Among them, 58 are males and 118 are females, aged between 18-24 years old.

The questionnaire is composed of images, textual descriptions and multiple-choice items, and the basic information of the test taker includes gender, age, nationality and other options. The scale is chosen in the form of a Likert-type 5-point scale, with "totally disagree" representing a score of 1, "partially disagree" representing a score of 2, "average" representing a score of 3, "partially agree" representing a score of 4, and "totally agree" representing a score of 5. There are 19 evaluation questions. After the test results are collected, 176 valid questionnaires are collected after eliminating those that take too little time and those with mostly consistent and unchanged options. According to related theory[31-32], the longer the scale is, the higher the sample requirement is. The sample size should be more than 5 times of the variables, and the overall sample size is greater than 100, the analysis results have the requirement of reliability, and the sample size of the article has met the requirement.

Then, the study analyzes the structural equation model after statistics. Through questionnaires, data are analyzed by using SPSS and Amos, forming a test scale by summarizing and analyzing the previous study and testing the feasibility of the scale by using validating factor analysis. And finally, the structural model analysis and research hypothesis validation are used to determine the model path diagram of this study.

3. Results And Validation

3.1 Multifactor scale validation and analysis

3.1.1 Analysis of validating factors

A total of 176 valid questionnaires are obtained, and in order to observe the relationship between the variables and the latent variables, the article uses validating factors to analyze the convergent and differential validity of the award-winning and high-volume merchandise models (see Figure 3).

Standardized estimates from validated factor analysis are as follows: product pleasure factor for award-winning and best-selling products ranged between 0.88-0.94, product beauty factor ranged between 0.80-0.94, product creativity factor ranged between 0.91-0.93, product sophistication factor ranged between 0.85-0.94, and product engineering factor ranged between 0.85-0.96. The purchase intention ranged from 0.90-0.95, and the valuation after standardization of each factor was higher than 0.7, indicating that the measurement system met the criteria (see Tables 5 and 6).

In the factor loading list, the composite reliability (CR) for each element of both ranges from 0.9141 to 0.9751, and the average variance extracted (AVE) ranges from 0.7809-0.9288. Both are above the values of 0.60 and 0.50 suggested by Bagozzi (1988), proving the internal consistency of the model (see Table 5 and Table 6).

Table 5
Factor Loading of Award-winning products

Path			Estimate	AVE	CR
1J3	<--	Pleasure	0.939	0.873	0.9537
1J2	<--	Pleasure	0.936		
1J1	<--	Pleasure	0.928		
1B3	<--	Beauty	0.797	0.7809	0.9141
1B2	<--	Beauty	0.921		
1B1	<--	Beauty	0.927		
1C3	<--	Originality	0.93	0.8649	0.9505
1C2	<--	Originality	0.933		
1C1	<--	Originality	0.927		
1D3	<--	Exquisite	0.935	0.8304	0.9361
1D2	<--	Exquisite	0.943		
1D1	<--	Exquisite	0.853		
1E3	<--	Ergonomics	0.927	0.8769	0.9553
1E2	<--	Ergonomics	0.925		
1E1	<--	Ergonomics	0.957		
1P1	<--	Degree of purchase	0.954	0.9095	0.9679
1P2	<--	Degree of purchase	0.951		
1P3	<--	Degree of purchase	0.956		

Table 6**Factor loading of Best-selling products**

Path			Estimate	AVE	CR
2J3	<--	Pleasure	0.924	0.8373	0.9391
2J2	<--	Pleasure	0.941		
2J1	<--	Pleasure	0.879		
2B3	<--	Beauty	0.916	0.8411	0.9407
2B2	<--	Beauty	0.9		
2B1	<--	Beauty	0.935		
2C3	<--	Originality	0.927	0.8514	0.945
2C2	<--	Originality	0.909		
2C1	<--	Originality	0.932		
2D3	<--	Exquisite	0.909	0.8459	0.9427
2D2	<--	Exquisite	0.934		
2D1	<--	Exquisite	0.916		
2E3	<--	Ergonomics	0.957	0.8343	0.9378
2E2	<--	Ergonomics	0.853		
2E1	<--	Ergonomics	0.927		
2P1	<--	Degree of purchase	0.948	0.9288	0.9751
2P2	<--	Degree of purchase	0.968		
2P3	<--	Degree of purchase	0.975		

The square root of AVE for each element in the discriminant validity category table ranges from 0.884 to 0.64, which is greater than the number of correlation coefficients for each element, accounting for more than 75% of the overall number of comparisons, and according to correlation theory[33], it proves that the correlation between the elements is low and has strong discriminant validity (see Table 7 and Table 8).

Table 7

Discriminant Validity of Award-winning products

	Pleasure	Beauty	Originality	Exquisite	Ergonomics	purchasing
Pleasure	0.873					
Beauty	0.499***	0.7809				
Originality	0.558***	0.502***	0.8649			
Exquisite	0.551***	0.497***	0.554***	0.8304		
Ergonomics	0.548***	0.492***	0.552***	0.553***	0.8769	
Purchasing	0.421***	0.898	0.446***	0.452***	0.265***	0.9095
AVE Square Root	0.934	0.884	0.930	0.911	0.936	0.954

Table 8

Discriminant Validity of Best-selling products

	Pleasure	Beauty	Originality	Exquisite	Ergonomics	purchasing
Pleasure	0.8373					
Beauty	0.518***	0.8411				
Originality	0.559***	0.5***	0.8514			
Exquisite	0.549***	0.499***	0.547***	0.8459		
Ergonomics	0.541***	0.493***	0.542***	0.542***	0.8343	
Purchasing	0.618***	0.701***	0.367***	0.313***	0.403***	0.9288
AVE Square Root	0.915	0.917	0.923	0.920	0.913	0.964

3.1.2 The analysis and validation of structural equation modeling

The paper uses structural equation modeling to validate the research hypotheses, in which potential and observed variables are observed as a way to analyze the causal relationship between best-selling and award-winning products. Based on the derivation and analysis, the final model of this study consists of 5 components and 19 measured variables. The independent variables are product emotional design (originality, beauty, pleasure, ergonomics, and exquisite), and the latent variables are preference and purchase intention. The results showed that the chi-square and degrees of freedom ratios were 1.49 and 1.978, respectively, and all indicators met the criteria except for the AGFI of the two products and the GFI of the best-selling product, which did not reach 0.9 (within the acceptable range). The above structural model tests are based on the definitions of scholars such as Hair, Black, Babin, Anderson, Tatham, Blunch and Kelly, H.H. [33-35]. The overall indicators of the model are almost at or close to acceptable levels, indicating that the overall structural model of the study has a good fit between the theoretical structure and the empirical data (see Table 9 and Table 10).

Table 9

Overall Fitting Coefficients of Award-winning products

x2/df	RMR	GFI	AGFI	PGFI	NFI	RFI	IFI	TLI	CFI	PNFI	PCFI	RMSEA
1.49	0.07	0.9	0.855	0.625	0.966	0.956	0.956	0.985	0.985	0.746	0.763	0.053

Table 10

Overall Fitting Coefficients of Best-selling Products

x2/df	RMR	GFI	AGFI	PGFI	NFI	RFI	IFI	TLI	CFI	PNFI	PCFI	RMSEA
1.978	0.088	0.872	0.816	0.816	0.955	0.942	0.942	0.97	0.97	0.97	0.97	0.075

3.2 Three-factor scale validation and analysis

3.2.1 Validation factor analysis

Validating factor analysis standardized estimates (SFL): the product emotional design factors of the award-winning and best-selling works range from 0.85-0.97, and the valuations after standardization were higher than 0.7, indicating that the measurement system met the criteria. The composite analysis model is shown in Figure 4.

In the factor loadings list, the composite reliability (CR) of each factor of both is 0.9854 and 0.9827, respectively, and the average variance extracted (AVE) is 0.9184 and 0.9046, respectively, which proves that the model is internally consistent (see Tables 11 and Table 12).

Table 11

Factor Loading of Award-winning products

Path			Estimate	AVE	CR
Degree of Preference	<--	Emotional Design	0.949	0.9184	0.9854
Ergonomics	<--	Emotional Design	0.955		
Exquisite	<--	Emotional Design	0.959		
Originality	<--	Emotional Design	0.961		
Beauty	<--	Emotional Design	0.963		
Pleasure	<--	Emotional Design	0.963		

Table 12

Factor Loading of Best-selling products

Path			Estimate	AVE	CR
Degree of Preferenc	<—	Emotional Design	0.932	0.9046	0.9827
Ergonomics	<—	Emotional Design	0.935		
Exquisite	<—	Emotional Design	0.971		
Originality	<—	Emotional Design	0.957		
Beauty	<—	Emotional Design	0.958		
Pleasure	<—	Emotional Design	0.953		

3.2.2 Structural model analysis and validation

From the results, it can be seen that the cardinality to freedom ratios of the award-winning and best-selling products are 2.531 and 4.218, respectively. All the indicators meet the criteria except that the AGFI of both products does not reach 0.9 and the PGFI for reaches 0.5 (within the acceptable range), and the RMSEA of the best-selling product is greater than 0.1. This result proves that the overall indicators of the model are almost at or close to the acceptable level, indicating that the overall structural model of the study has a good fit between the theoretical structure and the empirical data (see Tables 13 and 14).

Table 13

Overall Fitting Coefficient Table of Award-winning Products

x ² /df	RMR	GFI	AGFI	PGFI	NFI	RFI	IFI	TLI	CFI	PNFI	PCFI	RMSEA
2.531	0.038	0.949	0.890	0.441	0.986	0.977	0.992	0.986	0.991	0.610	0.614	0.094

Table 14

Overall Fitting Coefficient Table of Best-selling Products

x ² /df	RMR	GFI	AGFI	PGFI	NFI	RFI	IFI	TLI	CFI	PNFI	PCFI	RMSEA
4.218	0.054	0.928	0.833	0.398	0.978	0.962	0.983	0.971	0.983	0.559	0.562	0.136

3.2.3 Mediation effect

In the mediation effect analysis of award-winning products, the CI of indirect effect affective factor-purchase intention does not contain 0, the indirect effect holds, and Indirect effect/(Z) ≥ 1.96, the indirect effect holds, so the mediation

effect is significant, and the CI of direct effect preference-purchase intention does not contain 0, the direct effect is significant and is partially mediated.

In the analysis of the mediation effect of best-selling products, the CI of indirect effect affective factor-purchase intention does not contain 0, the indirect effect holds, and Indirect effect/(Z) ≥ 1.96 , the indirect effect holds, so the mediation effect is significant, and the CI of direct effect preference-purchase intention does not contain 0, the direct effect is significant and is partially mediated (see Table 15 and Table 16).

Table 15
Analysis of the Mediation Effect of Award-winning products

	Point estimate	Product of coefficients		Bootstrap5000time95%CI			
		SE	Z	Bias corrected		percentile	
				Lower	Upper	Lower	Upper
Emotional Factors-Purchase Intention	0.245	0.108	2.269	0.103	0.528	0.106	0.53
Degree of Preference-Purchase Intention	0.694	0.116	5.983	0.488	0.947	0.483	0.938
Emotional Factors-Degree of Preference	1.023	0.031	33	0.963	1.087	0.963	1.086

Table 16
Analysis of the Mediation Effect of Best-selling products

	Point estimate	Product of coefficients		Bootstrap5000time95%CI			
		SE	Z	Bias corrected		percentile	
				Lower	Upper	Lower	Upper
Emotional Factors-Purchase Intention	0.436	0.073	5.973	0.298	0.585	0.29	0.575
Degree of Preference-Purchase Intention	0.619	0.077	8.039	0.468	0.772	0.476	0.777
Emotional Factors-Degree of Preference	1.054	0.031	34	0.998	1.118	0.998	1.118

4. Analysis Of Verification Results

Based on the results of the analysis, in the three-factor model in Figure 4, it is demonstrated that the emotional design factor has an effect on both award-winning and best-selling products in Chinese cultural and creative products, and there is a correlation between the emotional design of the product, the degree of preference, and purchase intention. The mediating effect analysis proves that the degree of preference has a mediating effect on both best-selling and award-winning products, and the emotional design of the product influences people's preference and further influences people's purchase. However, in the multi-factor model, award-winning products and best-selling products, have different effects on the general consumers, and in this structural model, neither the creative factors of the product can directly affect the purchase intention and the degree of preference. beauty factors likewise do not directly affect purchase intention and

preference; nor do product sophistication factors affect purchase intention and preference levels. However, the engineering factor of award-winning products affects people's preference into, and the pleasure factor affects people's purchase, but this does not exist in the best-selling model, indicating that there is a difference between best-selling and award-winning products.

From the two structural models in this paper, it can be found that the path coefficients of the variables of creativity, beautys, engineering, and sophistication on product emotional design in real life and each factor loadings exceed 0.85 or more, which shows that these factors constitute product emotional design. Although a single factor cannot directly affect consumers' preferences and purchase intentions, they are all necessary factors for product emotional design items, and need to be combined with each other to directly affect consumers' preferences and purchase intentions. However, in the emotional design of the products judged by the competition, lay people will have the willingness to buy because of the pleasure factor and the preference because of the engineering factor, which means that the design guidelines of professionals will influence the preference or willingness to buy of the general consumers because of some outstanding features.

By examining the structural model diagram (see Figure 4) and observing the standardized regression coefficients (factor loadings) of each factor facet of product emotional design with its measurement variables, it can be found that the five facets within emotional design in the best-selling product are highest in sophistication, second in creativity, followed by beautys and last in engineering, while in the winning product the scores are consistent for sophistication, creativity and beautys and slightly lower for engineering. In the analysis for each facet, it can be found that each element has high factor loadings, with 0.94 for the winning entries of the pleasure facet (the impressive product with a sense of fashion) and 0.94 for the best-selling product (the impressive product); 0.96 for the winning entries of the Engineering facet (the product well made technically) and 0.96 for the best-selling product (the product with good operability); 0.93 for the winning beauty composition (the product with perfect ratio) and 0.94 for the best-selling product (the product with perfect ratio); 0.93 for the winning creative composition (the product with creativity, story, and creative use of product materials) and 0.93 for the best-selling product (the product with creativity, and creative use of product materials); 0.95 for the winning exquisite composition (the product with delicate workmanship) and 0.93 for the best-selling product (the product with delicate structure). These are the highest loadings for the composition factor, which is an influential variable and a factor that can be taken into account in order to influence consumers' preferences and purchase intentions in product emotional design. However, there is a clear difference between award-winning and best-selling products, indicating that professionals and non-professionals tend to agree on the overall recognition of emotional design, but there are differences in cognitive focus(see Table 17-20).

Table 17
Structural Model Analysis of Award-winning products

Variable Parameter			Standardized Path Coefficient	C.R.	P	Test Result
Emotional Design	<---	Degree of Preference	0.95	28.795	***	Established
Degree of Preference	<---	Purchase Intention	0.32	4.230	***	Established
Emotional Design	<---	Purchase Intention	0.65	8.285	***	Established

Table 18

Structural Model Analysis of Best-selling products

Variable Parameter			Standardized Path Coefficient	C.R.	P	Test Result
Emotional Design	<--	Degree of Preference	0.93	24.085	***	Established
Degree of Preference	<--	Purchase Intention	0.42	7.073	***	Established
Emotional Design	<--	Purchase Intention	0.56	9.052	***	Established

Table 19

Structural Model Analysis of Award-winning products

Variable Parameter			Standardized Path Coefficient	C.R.	P	Test Result
Degree of Preference	<-- -	Pleasure	0.22	0.619	0.536	Invalid
Degree of Preference	<-- -	Beauty	0.28	0.495	0.62	Invalid
Degree of Preference	<-- -	Originality	-0.14	-0.448	0.654	Invalid
Degree of Preference	<-- -	Exquisite	0.05	0.143	0.887	Invalid
Degree of Preference	<-- -	Ergonomics	0.56	2.581	0.01	Invalid
Degree of purchase	<-- -	Degree of Preference	0.31	2.863	0.004	Established
Degree of purchase	<-- -	Ergonomics	0.14	0.545	0.586	Invalid
Degree of purchase	<-- -	Exquisite	0.23	0.534	0.593	Invalid
Degree of purchase	<-- -	Originality	-0.19	-0.442	0.659	Invalid
Degree of purchase	<-- -	Beauty	-0.45	-0.65	0.516	Invalid
Degree of purchase	<-- -	Pleasure	0.96	2.408	0.016	Invalid

Table 20
Structural Model Analysis of of Best-selling products

Variable Parameter		Standardized Path Coefficient	C.R.	P	Test Result	
Degree of Preference	<-- -	Pleasure	-0.26	-0.49	0.624	Invalid
Degree of Preference	<-- -	Beauty	2.75	0.507	0.612	Invalid
Degree of Preference	<-- -	Originality	1.26	0.452	0.651	Invalid
Degree of Preference	<-- -	Exquisite	0.96	0.762	0.446	Invalid
Degree of Preference	<-- -	Ergonomics	-1.47	-0.455	0.649	Invalid
Degree of purchase	<-- -	Degree of Preference	0.48	3.616	***	Established
Degree of purchase	<-- -	Ergonomics	-0.4	-0.113	0.91	Invalid
Degree of purchase	<-- -	Exquisite	0.36	1.213	0.225	Invalid
Degree of purchase	<-- -	Originality	-2.6	-0.008	0.994	Invalid
Degree of purchase	<-- -	Beauty	0.3	0.491	0.623	Invalid
Degree of purchase	<-- -	Pleasure	-0.1	-0.157	0.875	Invalid

5. Conclusion And Suggestion

The Chinese manufacturing industry has always had superb and sophisticated production technology and rich manufacturing experience. However, in this era of constant change, consumer ideas and needs must be taken into account in order to make this industry unique, brandable and sustainable. All of these need to be explored through the study of relevant models, and their application in teaching and related industries. Based on literature research, theoretical model construction and analysis, this paper begins with literature exploration and designs a structural model to validate consumers' emotional conceptions of award-winning and best-selling cultural and creative products. The results of the study can be used in the emotional design of future products. The conclusions are summarized as follows:

1. The paper analyzes and validates the structural equation model constructed by using the product emotion design questionnaire as the research object, and verifies the feasibility of the emotion design model. The model is based on emotional design, from the multidimensional nature of emotion, to find out the influencing factors of product design, to build a representative index system, and to analyze the "emotional design evaluation scale" of new product design development for scientific decision making, in order to evaluate the emotional design of products, which can be used for design education and value-added product design in related industries. It can be used for design education and value-added product design in related industries.

2. The paper analyzes the influence of the emotional design of award-winning products and best-selling goods on the purchase intention of non-designed people, and found that the emotional design of award-winning products has a greater influence on the purchase desire, but overall, there is little difference between the two. The results show that the rating guidelines of professional designers can have a significant impact on the purchase motivation and preference of the non-professional consumer population by stimulating people's purchase intention through one factor of emotional design, but in real consumption, people's purchase behavior is more complex, and they decide the purchase behavior through the overall emotional experience formed by the interaction of several factors. This finding suggests that emotions can be used as a piece of heuristic information for decision-making when people are faced with complex decision-making tasks, so positive emotions, happy feelings and preferences all contribute to increased purchase intentions.

3. Based on the structural equation model in this paper, it can be found that the emotional design of the product (0.65 and 0.54) influences purchase intention, which is higher than the influence of preference (0.32 and 0.42) on purchase intention. Emotional design has a mediating effect between preference and purchase intention, and affective design influences people's preference for cultural and creative products and thus purchase intention. Although other single factors in emotional design do not directly affect consumers' preferences and purchase intentions, the emotional design of a product will ultimately affect people's preferences through interaction. Therefore, when designing creative products, more consideration should be given to the delicate and creative elements of emotional design. And in the actual design, we can consider more factors of product D2. good product structure, C3 creative use of product materials, C1. novelty and uniqueness of the product.

With the diversification of China's industrial field and the maturity of production technology, there is a demand for product design. The paper uses localized and Chinese characteristic connotations, and through emotional design standards and design models, it can help China's cultural and creative industry to shape an industrial brand image with a unique style. At the same time, integrating the focus of today's cultural and creative product design into future teaching can be helpful to cultivate design talents that are more in line with the current market needs. Through this research, we can see that various design concepts and methods have challenged traditional industrial practices. Only by providing high-quality cultural product designs for related industries can the industry visibility and competitiveness of enterprises be improved. Currently, this research only surveys college students studying in China. Because the subject matter of the product is the same as the Chinese cultural background, most of the testees have a similar understanding of the cultural connotation conveyed by the product. The following research will be able to expand the investigation of different ethnic groups and product varieties, and make more in-depth discussions on the emotional design of product brand image, the internationalization of local styles, and market acceptance.

Declarations

Availability of data and materials:

Data obtained by questionnaire.

Competing interests:

The authors declare that they have no competing interests.

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Authors' Contributions:

Wang conducted the collection and research, Yu and Chen designed the questionnaire, and Yu, Feng and Kong participated in the analysis of the synthesis, data analysis and model construction. All authors read and approved the final manuscript.

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Table

Table 1 is available in the Supplementary Files section

Figures

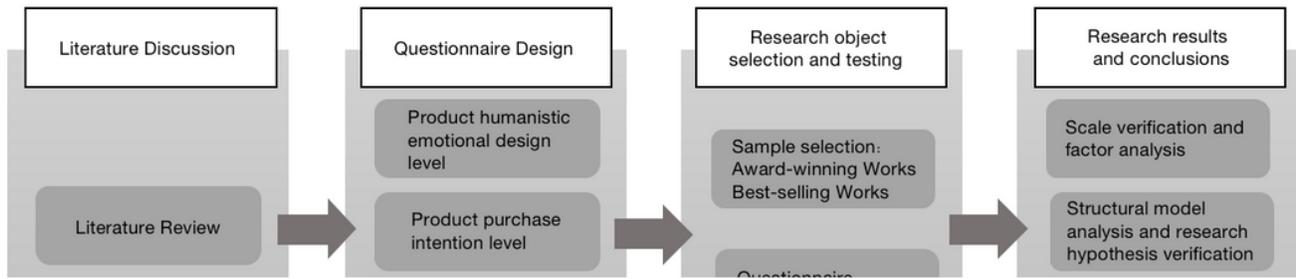


Figure 1

Research process

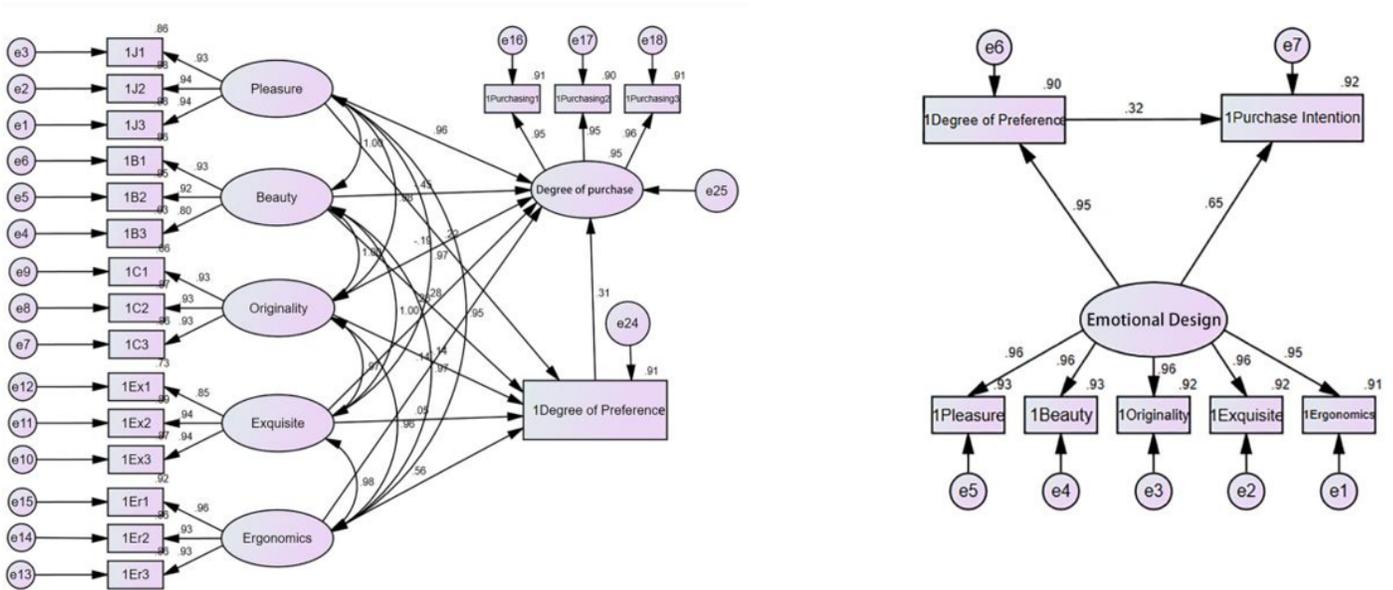


Figure 2

Conceptual model

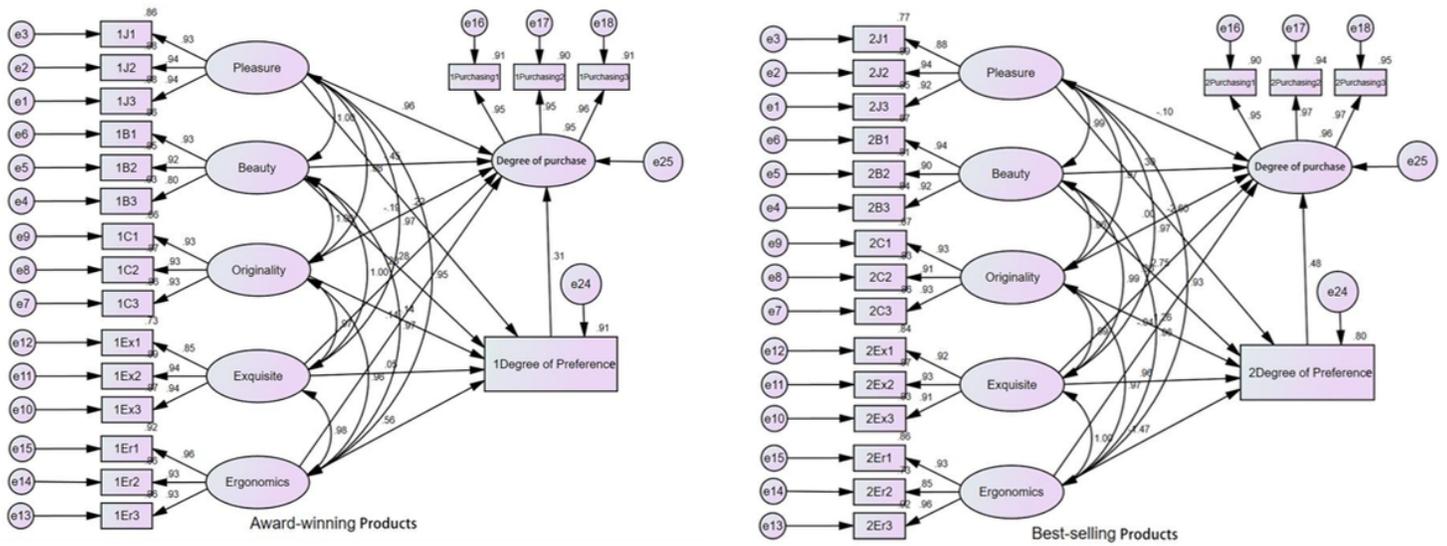


Figure 3

Award-winning products and Best-selling products drawings model

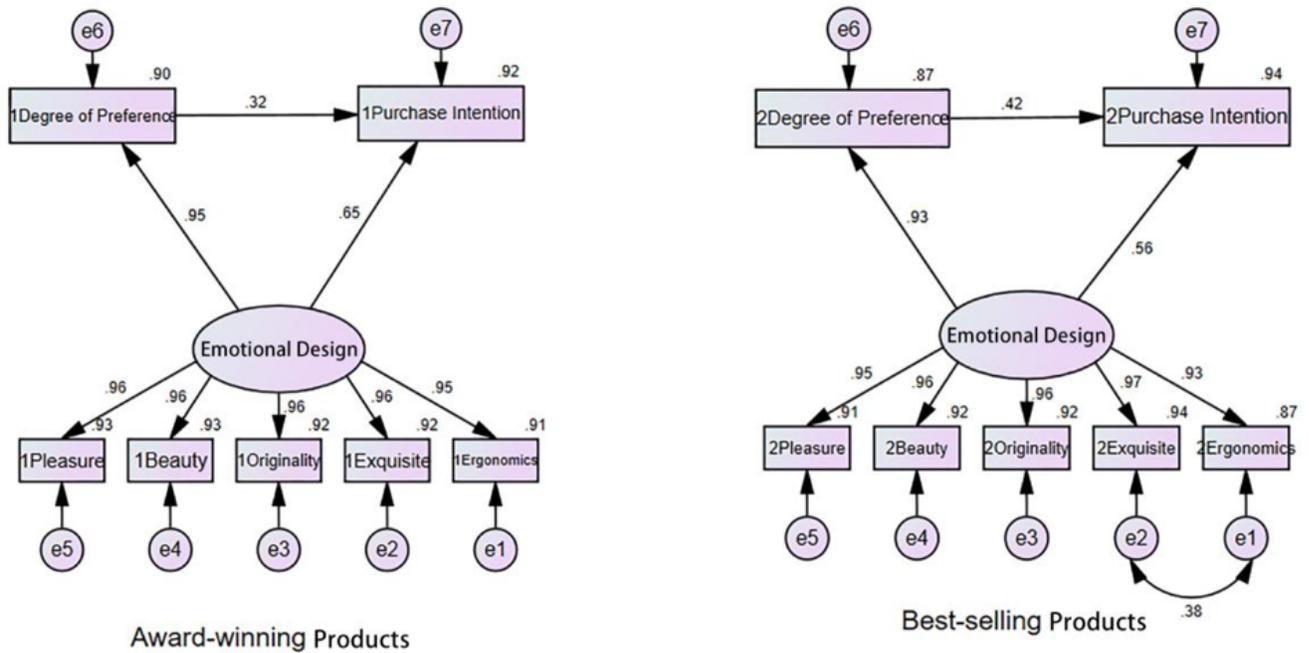


Figure 4

Three-factor analysis model

Supplementary Files

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