

## Investigative analysis of Hongshan culture pattern design proposed through creative product design



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### ABSTRACT

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Throughout the long history of China, the Hongshan culture stands out as an outstanding and distinctive traditional culture. As a treasure of Chinese art, how to effectively inherit and promote Hongshan culture pottery is a topic worthy of our study. This research purpose to delve into the most representative and unique design features of Hongshan culture, the requirements and ideas of different groups for the application of Hongshan culture pottery patterns in cultural creative products, and explore how to ingeniously integrate these features into the design of cultural creative products. On methodology, using the method of questionnaire survey to analyze the feasibility of applying Hongshan culture pottery pattern elements in cultural creative products, detailed questionnaires are formulated and distributed to respondents via the internet, aiming to obtain extensive participation and diverse perspectives. On findings, data analysis using SPSS software is conducted to reveal common design preferences, resonances, and potential innovative directions among respondents, providing practical and feasible suggestions for the field of creative product design. The practical implications of this study is not only enriches the cultural resources of the current cultural creative market but also helps to promote the dissemination of traditional culture, injecting new vitality into Hongshan culture pottery, and presenting it anew to the public.

**Contribution/ Originality:** This research of the study aims to deeply explore the most representative and unique design features of Hongshan culture pottery patterns, The research is unique in that explore the opinions of different people's requirements and ideas for the application of Hongshan culture pottery patterns in cultural creative products, and explore how to skillfully integrate these features into the design of cultural creative products.

### 1. INTRODUCTION

What is the finest characteristic design of Hongshan culture that fit into creative product design? It is the focus of academic and creative industries. This research of the study aims to deeply explore the most representative and unique design features of Hongshan culture pottery patterns, different people's requirements and ideas for the application of Hongshan culture pottery patterns in cultural creative products, and explore how to skillfully integrate these features into the design of cultural creative products. In order to understand the public's views and opinions on this issue more comprehensively, the questionnaire method is adopted as the research method. By developing detailed questionnaires and distributing them to respondents online, we strive to obtain broad

participation and diverse perspectives. The questionnaire covers a series of questions about the design characteristics of Hongshan culture pottery patterns, aiming to explore the respondents' perceptions, appreciation and potential use of these design elements. The resulting data was analyzed using SPSS software to reveal design preferences, consensus points and possible innovation directions prevalent among respondents. This in-depth data analysis will provide us with insights that will help answer research questions and provide practical recommendations for the field of creative product design.

## 2. LITERATURE REVIEW

### 2.1. Pottery Patterns of Hongshan Culture

Hongshan culture has a long history. Hongshan pottery pattern occupies an important position in the history of Chinese civilization because of its unique aesthetic characteristics and high artistic value. The aesthetic study of Hongshan pottery pattern can not only provide some theoretical reference for the study of ancient history, but also provide some practical reference for the development of modern aesthetics and current art design, so it has strong theoretical and practical significance.

The pattern of Hongshan painted pottery is the crystallization of beauty with high unity of material and spirit created by Hongshan ancestors in the Neolithic Age. It is a unique artistic phenomenon in the aesthetic field. The pattern of Hongshan painted pottery has been one of the hot spots for scholars to study. Chinese and foreign scholars have put forward different views on the classification and characteristics of the pattern of Hongshan painted pottery. The earliest reference to Hongshan painted pottery is Liang Siyong's *Archaeological Essays* (Liang, 1959). Mr Su Bingqi books of the new origin of Chinese civilization (Su, 2019) and "Chinese archaeological roots a Chinese descendants of the dragon" (Su, 1994) two books, and archaeologists Guo Dashun works of Hongshan culture research (Guo, 2005) both from the perspective of archaeology and history, Hongshan culture pottery were studied, Guo Dashun firstly gives a comprehensive introduction to the discovery and research process of Hongshan culture. The study of Hongshan culture in the book starts with the analysis of the relics of important sites of Hongshan culture, and on this basis, the stages of Hongshan culture, the primitive religious beliefs of Hongshan culture, Hongshan culture jade and pottery, Hongshan culture tombs, Hongshan culture settlements, Hongshan culture. Then it analyzes the status of Hongshan civilization and its relationship with the origin of civilization. It summarizes the types and uses of pottery in each period of Hongshan culture, but does not mention its patterns. In Zhang Mingchuan's *Atlas of Chinese Painted Pottery*, he studied the pottery patterns of Hongshan culture from the aspects of types and distribution. It is believed that the pattern drawing of Hongshan cultural painted pottery is more rigorous, and it is good at using oblique lines and arcs, so that the pattern has both curved changes and hook back echoes. The pattern bands, often composed of different patterns, are arranged in multiple layers on the upper belly of the pottery, with repeated patterns to enhance the decorative effect, and the pattern structure is unique (Zhang, 2005). Lu Sixian studied the aesthetic connotation of patterns from the perspective of totemic historical materials and religion in his article "A Study of Patterns on Painted Pottery in Xiajiadian Lower Culture" (Lu, 2002). Zhao Yongxin's *Research on the Application of Hongshan Painted Pottery Patterns in Mongolian Furniture Decoration Design* classifies and summarizes the typical patterns of Hongshan painted pottery patterns, and innovatively summarizes, abstracts, simplifies, decomposes and reconstructs the patterns of Hongshan painted pottery patterns and exaggerates and beautifies them (Zhao, 2013). Bai Yalike's "The Aesthetic Study of the Decorated Pottery of Hongshan Culture" proposed the beauty of the form of the decorated pottery of Hongshan culture so as to carry out aesthetic research, and compared it with the decorated pottery of other regions of the same period, starting from the characteristics, types, evolution rules and distribution characteristics of the decorated pottery of Hongshan culture, to find out its contained unique aesthetic value (Bai, 2007) She also pointed out in the article "Discussing the Evolution of Painted Pottery Patterns of the Hongshan Culture" that there were many kinds of painted pottery patterns of the Hongshan culture, which could be classified

into two categories: natural patterns and geometric patterns. The main reason why the coloured pottery decoration is so diversified during the Hongshan culture period is that it has accepted the advanced agricultural culture of Yangshao in the south of China's Yanshan Mountain in Hebei and Henan areas. In the late Hongshan Culture, the subjects of painted pottery decoration were basically witch paintings. The evolution of economic forms and the continuous maturation and development of religion created the art of ornamentation of the Red Mountain Culture in all its forms and colours (Bai, 2008). Translated with [www.DeepL.com/Translator](http://www.DeepL.com/Translator) (free version) In The Application of the Patterns of Hongshan Painted Pottery, Wu Dong analyzed the patterns of Hongshan Painted pottery from an artistic point of view and applied them to the design of cultural products, starting a precedent in the application design of the patterns of Hongshan Painted pottery (Wu, 2015). Yang Hu's Several Problems on the Hongshan Culture (Yang, 1986) and Zhu Yanping's Collection of Archaeological Culture (Zhu, 1993) first explained the characteristics of The Times of the painted pottery patterns of Hongshan, but they only used patterns to verify the division of periods without detailed patterns. Suo Xiufen and Li Shaobing's Research on Hongshan Culture made a clear and detailed discussion on each period of Hongshan painted pottery and further outlined the morphological characteristics and patterns of each period (Suo & Li, 2011). In the book Ancient Charm -- Outline of Chinese Painted Pottery Art by Cheng Jincheng, the naming, classification, and classification of the patterns of Red Mountain painted pottery as well as the research results in the aspects of religious and aesthetic significance are introduced, which provides a reference for the basic research on the application of Red Mountain painted pottery patterns in cultural creative products in this paper (Cheng, 2001). Analysis Table of the Characteristics and Evolution Law of the Painted Pottery Patterns of Hongshan Culture points out the evolution process of the painted pottery patterns of Hongshan Culture, from the beginning to the peak and then to the decline, which provides a certain reference for the discussion on the formation and change of the painted pottery patterns of Hongshan Culture. Yan Shuqin, in the paper "The Application of Traditional Abstract Ornamentation in Modern Cultural and Creative Design -- Taking Liaoning Hongshan Cultural Painted Pottery as an example", starts with the abstract ornamentation of Hongshan Cultural traditional painted pottery, and analyzes the cultural meaning contained in it and the clever thinking of composition. Through the analysis of the historical evolution of traditional abstract patterns of Hongshan culture, the application of them in modern cultural and creative design is explored (Yan, 2023). In his article Neolithic Times, Yin Da analyzed Hongshan pottery and believed that it contained pottery features of Neolithic microstone culture in the north of the Great Wall of China and Yangshao Culture in the south of the Great Wall of China. It was caused by the mutual influence of two Neolithic cultures in the north and south of the Great Wall of China (Yin, 1954).

## 2.2. Cultural and Creative Product Design

Study of cultural and creative product design aspects, Peters K in the Negotiating the 'Place' and 'Placement' of Banal Tourist Souvenirs in the Home, it is believed that cultural and creative product are items that consumers can recall their past experiences at home and buy in the market (Peters, 2011). Beverly Gordon in the Souvenir: Messenger of the extraordinary, divided cultural and creative product are into five categories for analysis and considered as special items for conveying information (Gordon, 1986). In the Product and Process Orientations to Tourism Shopping, Yu H, Littrell M A in the Product and process orientations to tourism shopping, analyzed that the Product characteristics of handicrafts in the cultural and creative product had A positive impact on the tourist experience. In other words, the more prominent the creative design features of product are and the stronger the regional cultural characteristics are, the stronger the tourists' desire to buy them will be (Yu & Littrell, 2003). Turner L W and Reisinger Y in the Shopping satisfaction for domestic tourists, argued that quality and cheap cultural and creative product, products with proper specifications and well-designed packaging, and product uniqueness are the three most important attributes. In the Current Situation Analysis and Design Research of Regional Cultural and Creative Product Design (Li, 2021) the author analyzed the lack of

cultural connotation, design innovation and other problems in the past cultural and creative product design. The current cultural and creative product design not only has profound regional cultural connotation, but also gives consideration to innovative design, the combination of technology and design, practicality and innovation.

In *The Attributes and Characteristics of Cultural and Creative Products* (Wei, 2010) Wei believes that cultural and creative products refer to products from the field of cultural and creative industry, and their cultural and creative content and external carriers are interdependent and inseparable. Cultural creative products generally take cultural creative ideas as the core, and are the products that designers materialize the content they understand spiritually, and create cultural products with cultural connotation, symbolic significance, aesthetic education function and other spiritual values. Therefore, the cultural creative product design explored in this research should be based on culture, and the material or non-material with cultural connotation should be recreated and redesigned to form creative products with modern significance.

### 3. METHODOLOGY

This research collected data through the distribution of online questionnaires. Following data processing, statistical analysis was conducted using SPSS software, The methods employed include descriptive statistics, correlation analysis, and classification summary analysis. Subsequently, meaningful analytical results were obtained.

The questionnaire consists of three sections. The first section pertains to personal information, the second section focuses on respondents' understanding and design suggestions regarding the Hongshan Culture pottery patterns, and the third section relates to respondents' preferences regarding the Hongshan Culture pottery patterns. The first section includes gender, age, and occupation. The second section covers the level of understanding of the Hongshan Culture pottery patterns, purpose of visiting Hongshan Culture sites, pricing, purchase history of cultural creative products, and subjective suggestions on the design and application of Hongshan Culture pottery patterns in cultural creative products. The third section comprises four scales: design feature preferences, design color preferences, design category preferences, and purposes preferences of purchase and usage. The Likert five-point scale is used for scoring, where 1 represents strongly disagree and 5 represents strongly agree. A higher score indicates greater agreement. This research utilized the "Questionnaire star" platform to distribute electronic survey questionnaires to participants' smartphones or computers, facilitating their responses and ensuring convenient and prompt data collection. Once the questionnaire was configured, electronic survey questionnaires were disseminated via online delivery and QR code scanning for completion. A total of 570 questionnaires were collected in this study. After excluding 14 invalid responses, a final sample of 556 valid questionnaires was obtained, resulting in an effective response rate of 97.54%.

### 4. RESULTS

#### 4.1. Reliability and Validity Test

The questionnaire underwent a Cronbach's Alpha reliability test. The statistical results, as shown in [Table 1](#), reveal the Cronbach's  $\alpha$  coefficients for each dimension as follows: the Cronbach's  $\alpha$  coefficient for design feature preference factors is 0.729, for design color preference factors is 0.777, for design category preference factors is 0.677, and for purchase purpose factors is 0.622. All scales of the questionnaire exceed 0.6, indicating acceptable data reliability quality suitable for further analysis.

**Table 1.** Reliability analysis.

Dimension partitioning	Number	Cronbach's $\alpha$
Design feature preference	6	0.729
Design color preferences	2	0.777
Design category preferences	4	0.677
Purpose of purchase	5	0.622

Validity analysis of the scale was conducted using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The results of the analysis are presented in Table 2. The KMO measure for the scale was 0.842, which exceeds 0.6, indicating good sampling adequacy. Additionally, Bartlett's test of sphericity yielded a p-value of less than 0.001, suggesting the presence of interrelated factors among variables and supporting the suitability of the data for factor analysis.

Table 2. KMO and Bartlett ball test results of the scale.

KMO		0.842
Bartlett sphericity test	Approximate chi-square	7674.114
	<i>df</i>	136
	<i>p</i> -value	0***
<p>Note: The "****" in the table indicates that the <i>p</i>-value of the test is compliance with the requirements.</p>		

#### 4.2. Analysis of General Survey Results

##### 4.2.1. Description of Demographic Characteristics of the Sample Population

From Table 3 and Figure 1, it can be observed that in terms of gender distribution, there are more females in the sample, accounting for 60.43%, while males constitute 39.57% of the respondents. Looking at the age distribution, the majority fall within the age groups of 20-40 years and 40-60 years, accounting for 42.27% and 34.17%, respectively. The next significant groups are respondents under 20 years old and those above 60 years old, accounting for 11.87% and 11.69%, respectively. This age distribution suggests that the surveyed respondents are mainly middle-aged and young adults, indicating the survey's ability to reflect the participation of different age groups in society, thus demonstrating its representativeness. In terms of occupation, respondents in administrative positions, administrative staff, company employee constitute the largest proportion at 48.02%. Following them are freelancers and others, accounting for 20.32%, students at 16.37%, Self-employed, business owner at 11.15%, and researchers at 4.14%. This indicates that the surveyed respondents are individuals with certain occupational status and income. Moreover, it is evident that the majority of respondents are employed individuals rather than students or researchers. The relatively high proportion of freelancers and others may be attributed to the current emphasis on entrepreneurship and freelance work in society. Additionally, the significant proportion of Self-employed, business owner suggests a noticeable trend towards individual entrepreneurship in the current economic environment. Overall, the distribution of demographic characteristics is relatively balanced, allowing for further analysis.

Table 3. Overview of factors characterizing the demographics of the sample.

Variable	Option	Frequency	Percentage (%)
Gender	Male	220	39.57
	Female	336	60.43
Age	Below 20 years old	66	11.87
	20-40 years old	235	42.27
	41-60 years old	190	34.17
	60 years old and above	65	11.69
Occupation	Student	91	16.37
	Administrative staff, company employee	267	48.02
	Researcher	23	4.14
	Self-employed/Business owner	62	11.15
	Freelancers and others	113	20.32
Total		556	100

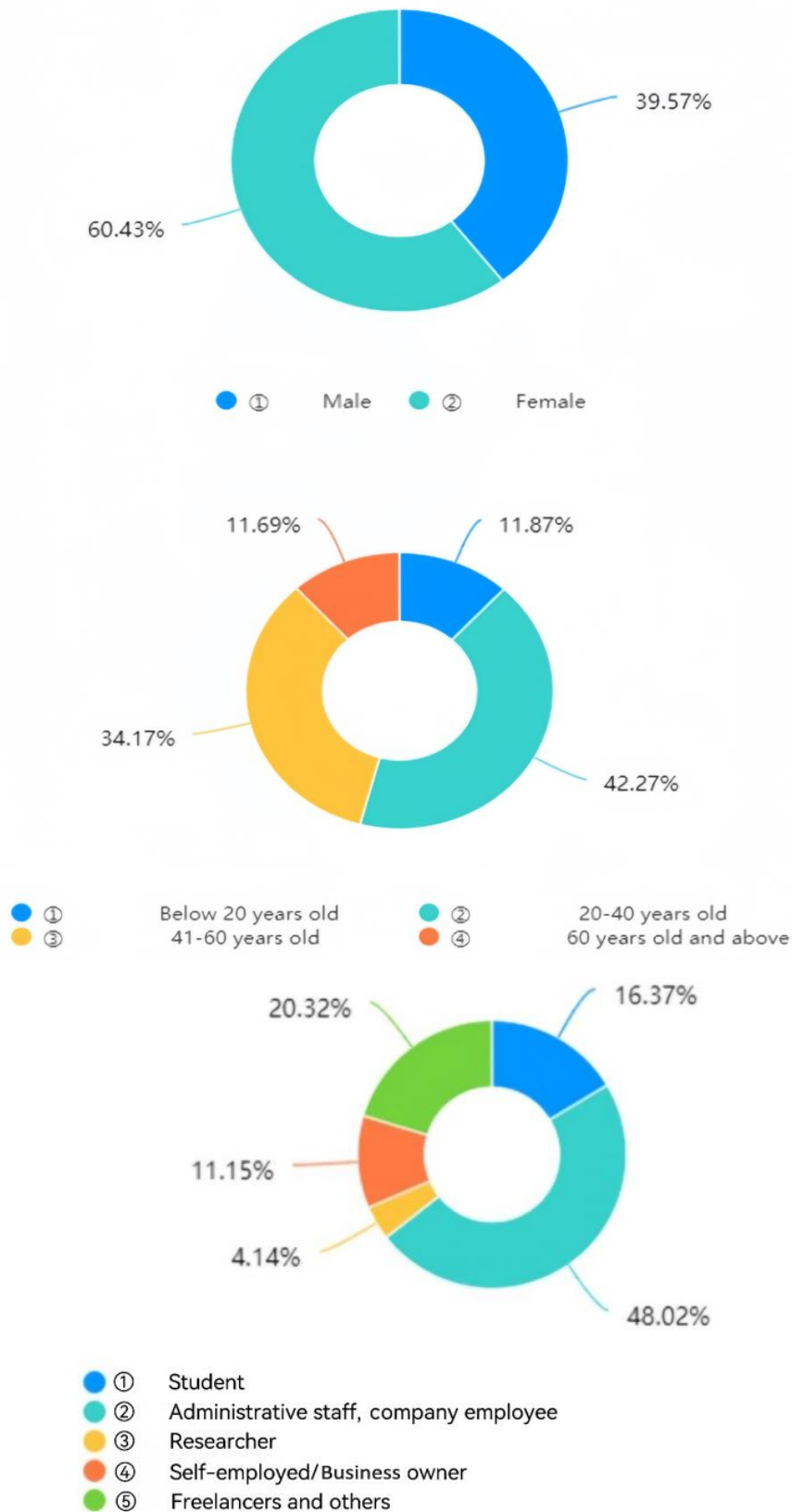


Figure 1. Gender age occupation.

#### 4.2.2. Respondents' Understanding of Hongshan Culture Pottery Patterns

From the perspective of Figure 2, it can be observed that the majority of respondents have don't quite understand of the pottery patterns of the Hongshan culture, accounting for 38.49%. Following this, there are respondents with understanding of some, accounting for 31.29%. Those with know well account for 13.31%, while



those who have known nothing at all account for 12.41%. Respondents who have a very understanding represent 4.50% of the total. These data indicate that the majority of individuals have only a moderate level of understanding of the pottery patterns of the Hongshan culture, with only a small number possessing a deeper understanding. It suggests that public awareness of Hongshan culture pottery patterns is generally limited and requires more education and dissemination to enhance public awareness and understanding of this cultural heritage.

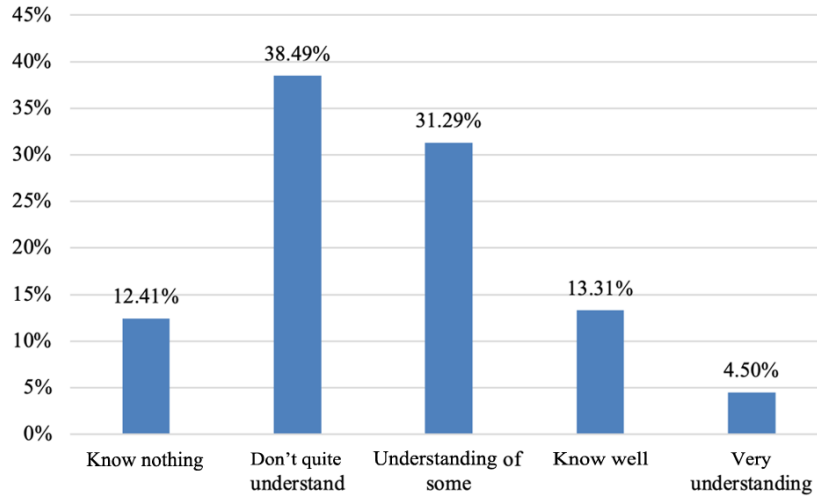


Figure 2. What do you know about the patterns of Hongshan culture pottery?

From the perspective of Figure 3, it can be observed that the vast majority of respondents visit Hongshan cultural sites for tourism and sightseeing purposes, accounting for 72.12%. This indicates that Hongshan cultural sites have a high level of tourist attraction and cultural value, attracting a large number of visitors for sightseeing and exploration. Following this, 10.79% visit friends and relatives, which may reflect the significance of Hongshan cultural sites as important cultural and historical landmarks, attracting people to explore their roots and visit relatives and friends. Respondents visiting Hongshan cultural sites for other purposes account for 10.25%, which may include personal interests, academic research, cultural exchange, etc. Lastly, 6.83% visit for scientific research and investigation purposes, possibly because scientific research requires more specialized knowledge and research background, with a higher entry barrier.

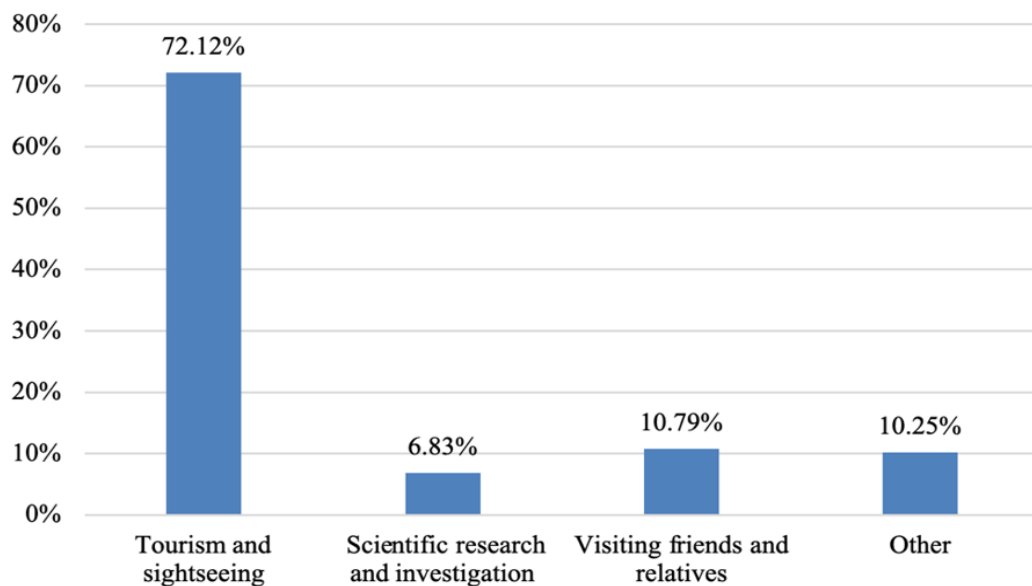


Figure 3. If given the opportunity, what would be the purpose of your visit to the Hongshan culture site?

From the perspective of Figure 4, it can be observed that the majority of respondents have not purchased cultural creative products, accounting for 58.99%. 41.01% of respondents have purchased cultural creative products. This implies that although cultural creative products have a certain influence in the market, there is still a considerable portion of consumers who have not purchased such products. Possible reasons include a lack of understanding of cultural creative products among consumers, a lack of purchasing channels, or lack of interest in cultural creative products, among others. Measures such as strengthening promotion and education, innovative design, providing convenient purchasing channels, reasonable pricing, and introducing appealing products can promote the sales and market development of cultural creative products.

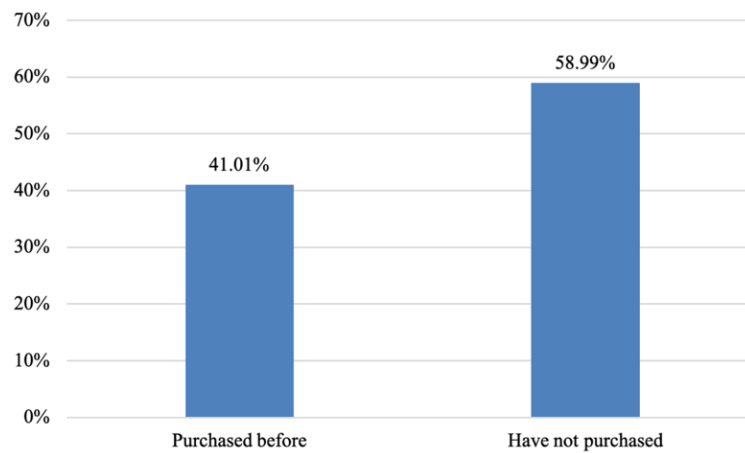


Figure 4. Have you ever purchased cultural and creative products?

From the perspective of Figure 5, it can be observed that the majority of respondents accept cultural creative products priced at below 200-yuan, accounting for 38.49%. The next most preferred price range is between 200- and 500-yuan, accounting for 32.91%. This implies that when formulating pricing strategies for cultural creative products, priority should be given to these price ranges, and product types should be designed accordingly. 19.60% of respondents can accept cultural creative product prices ranging from 500 to 1000 yuan, while only a small proportion of respondents can accept prices above 1000-yuan, accounting for 8.99%. It is necessary to carefully consider the introduction of products in this price range. Therefore, it is essential to develop a competitive pricing strategy for cultural creative products based on an understanding of the demands and competitive landscape of the target market, combined with product costs and profits.

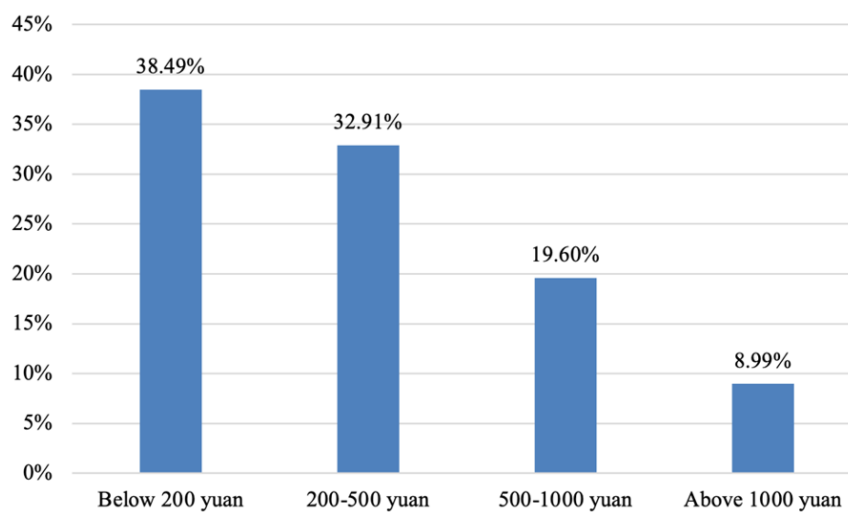


Figure 5. The cultural and creative product price range you are willing to accept?



### 4.2.3. Analysis of Respondents' Preferences for Design Features

#### 4.2.3.1. Importance Analysis of Each Factor

To explore the preferences of respondents regarding various design characteristics in the design of Hongshan culture pottery patterns, this study conducted descriptive statistics on six design characteristic factors. The results from Table 4 indicate that respondents value integration of cultural heritage and innovation the most, with a mean score of 4.406. Following this is the clear and distinctive features, with a mean score of 4.097, followed by the designed to be exquisite patterns, with mean scores of 4.059. The reflects auspicious symbolism and fashionable and uniquely designed have mean scores of 3.849 and 3.820, respectively. Relatively, respondents consider the interestingness of design to be the least important factor, with a mean score of 3.558. Thus, respondents believe that innovation based on preserving traditional culture is crucial, and a good design should intuitively convey product information.

**Table 4.** Design features preference descriptive statistics for each factor.

Variable	Size	Min.	Max.	Mean	Std.	Median
Integration of cultural heritage and innovation	556	1.000	5.000	4.406	0.650	4.000
Reflects auspicious symbolism	556	1.000	5.000	3.849	1.174	4.000
Designed to be exquisite patterns	556	1.000	5.000	4.059	1.111	4.000
Clear and distinctive features	556	1.000	5.000	4.097	1.051	4.000
Fashionable and uniquely designed	556	1.000	5.000	3.820	1.249	4.000
Interestingness	556	1.000	5.000	3.558	1.360	4.000

#### 4.2.3.2. Correlation Analysis

In order to investigate whether there are correlations among various design characteristic factors, as well as the degree and direction of these correlations, this study utilized correlation analysis to examine the relationships among six design characteristic factors: "Integration of cultural heritage and innovation," "Reflects auspicious symbolism," "Designed to be exquisite patterns," "Clear and distinctive features," "Fashionable and uniquely designed," and "Interestingness." The Pearson correlation coefficient was employed to indicate the strength of these relationships. The Pearson correlation coefficient is a value between -1 and 1, used to represent the linear relationship between two variables. A value close to 1 indicates a strong positive correlation, a value close to -1 indicates a strong negative correlation, while a value close to 0 indicates no correlation. Specific analyses reveal:

From Table 5, except it is evident that there is no correlation between the designed to be exquisite patterns and the clear and distinctive features, as well as the interestingness. However, significant correlations ( $P < 0.01$ ) exist among all other factors, with correlation coefficient values ranging between 0.179 and 0.619. This indicates a positive correlation among these factors, suggesting that respondents believe that the design of Hongshan culture pottery patterns should incorporate elements of traditional culture while embodying modern innovation. Additionally, it should intuitively convey product information, exhibit exquisite details and aesthetic overall effects, incorporate auspicious meanings to enhance the cultural connotation and attractiveness of the product, and keep up with contemporary trends in fashion. In summary, the design of Hongshan culture pottery patterns should consider multiple factors to achieve the best design effect. This requires not only the consideration of traditional cultural heritage and innovation but also contemporary aesthetics and market demands.

Table 5. Correlation analysis.

Variable	Integration of cultural heritage and innovation	Reflects auspicious symbolism	Designed to be exquisite patterns	Clear and distinctive features	Fashionable and uniquely designed	Interestingness
Integration of cultural heritage and innovation	1					
Reflects auspicious symbolism	0.329**	1				
Designed to be exquisite patterns	0.234**	0.619**	1			
Clear and distinctive features	0.328**	0.332**	0.393**	1		
Fashionable and uniquely designed	0.366**	0.254**	0.039	0.584**	1	
Interestingness	0.334**	0.283**	0.058	0.179**	0.554**	1

Note: \*\* p<0.01.

#### 4.2.4. Analysis of Respondents' Color Preference in Design

##### 4.2.4.1. Descriptive Statistics

To explore the preferences of respondents regarding the color scheme in the design of Hongshan culture pottery patterns, this study conducted descriptive statistics on two design color factors. The results of the analysis are presented in Table 6. The results revealed that respondents prefer colors that are match the cultural themes, with a mean score of 4.095, while bright and visually impactful colors had a mean score of 3.957. This indicates that in the design of Hongshan culture pottery patterns, colors should be closely related to the cultural theme, reflecting its cultural characteristics and connotations. This color scheme can be achieved by incorporating colors and textures associated with Hongshan culture, thus better expressing and conveying the uniqueness and charm of Hongshan culture. Additionally, bright and visually impactful colors are also among the factors that respondents value. This color scheme can be realized by using bright and visually impactful colors, as well as strong contrasting colors, to enhance the attractiveness and visual effects of the patterns. Therefore, designers can create Hongshan culture pottery patterns that are attractive and distinctive by combining respondents' preferences with cultural themes and modern aesthetic concepts, and tailoring the design color scheme accordingly to different audience groups.

**Table 6.** Descriptive analysis of each factor of design color preference.

Variable	Size	Min.	Max.	Mean	Std.	Median
Colors that match the cultural themes	556	1.000	5.000	4.095	1.199	5.000
Bright and visually impactful colors	556	1.000	5.000	3.957	1.243	4.000

#### 4.2.5. Analysis of Respondents' Preferences for Product Categories

##### 4.2.5.1. Descriptive Statistics

To explore respondents' preferences for product categories in Hongshan culture pottery pattern design, this study conducted descriptive statistics on the following four product category factors. The results of the analysis are presented in Table 7. The results indicate that respondents prefer clothing and daily accessories products the most, with a mean score of 4.043. This suggests that they find applying Hongshan culture pottery patterns to clothing and daily accessories products highly attractive. These products can serve as a combination of decoration and practicality, showcasing the characteristics and charm of Hongshan culture. Following this is daily necessities, with a mean score of 3.671, indicating that respondents believe applying Hongshan culture pottery pattern design to daily necessities such as tableware and tea sets can enhance the artistic and cultural significance of these items, enhancing the user experience. Stationery products received a mean score of 3.644, indicating that respondents believe applying Hongshan culture pottery pattern design to stationery items such as notebooks and pens can enhance the cultural significance and aesthetic appeal of these items. Home decoration products received a mean score of 3.604, suggesting that while applying Hongshan culture pottery pattern design to home decoration may not be particularly popular, there is still some market potential. Therefore, designers can choose suitable product categories for development and promotion based on market demand and consumer preferences.

**Table 7.** Design a descriptive analysis of each factor of category preference.

Variable	Size	Min.	Max.	Mean	Std.	Median
Clothing and daily accessories products	556	1.000	5.000	4.043	1.122	4.000
Stationery	556	1.000	5.000	3.644	1.267	4.000
Daily necessities	556	1.000	5.000	3.671	1.251	4.000
Home decoration	556	1.000	5.000	3.604	1.431	4.000

#### 4.2.6. Analysis of Purchasing Purposes Among Respondents

##### 4.2.6.1. Descriptive Statistics

To explore the purposes of purchasing cultural and creative products among respondents, this study conducted descriptive statistics on the following five purpose factors. The results of the analysis are presented in Table 8. The results revealed that the primary purpose of purchasing cultural and creative products among respondents is for commemorative significance, with a mean score of 4.162. This is followed by daily use, with a mean score of 4.144. Some respondents also purchase cultural and creative products for the purpose of gift-giving, with a mean score of 3.817. The purpose of fashion accessories has a mean score of 3.772, and finally, the purpose of home decoration has a mean score of 3.435. It can be observed that respondents have various purposes for purchasing cultural and creative products, with a greater inclination towards using these products for daily use or commemorative significance rather than as decorative items.

Table 8. Descriptive analysis of purchase purpose factors.

Variable	Size	Min.	Max.	Mean	Std.	Median
Daily use	556	1.000	5.000	4.144	0.903	4.000
Commemorative significance	556	1.000	5.000	4.162	0.739	4.000
Gift-giving	556	1.000	5.000	3.817	1.146	4.000
Home decoration	556	1.000	5.000	3.435	1.436	4.000
Fashion accessories	556	1.000	5.000	3.772	1.336	4.000

#### 4.2.7. Analysis of Cultural and Creative Product Design Preferences of Different Age Groups

This part analyzes the product design preferences across different age groups. From Table 9, it can be observed that groups below 20 years old tend to interestingness in product design. They are likely interested in innovative elements and unique design styles that capture their attention and stimulate their interest. The age group of 20-40 emphasizes the clear and distinctive features. They are inclined towards designs that can intuitively convey product features, functions, and usability, typically characterized by simplicity, clarity, and ease of understanding and memorization. In the age group of 41-60, there is a greater emphasis on the exquisite patterns in design. They may favor designs with meticulous details, excellent craftsmanship, and visually stunning effects, which can showcase product quality and unique aesthetics. Respondents aged 60 and above show a preference for auspicious meanings in product design. They are likely to prioritize the symbolism and significance associated with products, as well as the blessings and auspicious imagery they can bring, typically related to traditional culture and beliefs, meeting their expectations for meaning and blessings.

In terms of color preferences in product design, respondents below 20 years old and 60 years old and above tend to prefer colors that match the cultural themes. Those below 20 years old are typically in a learning phase and have a stronger sense of identification and belonging to culture, history, and tradition. They may gravitate towards colors that express their cultural background and values. 60 years old and above usually have rich life experiences and cultural insights, leading them to prioritize colors that resonate with their cultural background and values. Respondents aged 20-40 and 41-60 show a preference for bright and visually impactful colors. As individuals in these age groups are often in the stage of career development, they require attention-grabbing products to enhance productivity and attract attention in their professional and personal lives. Bright, visually striking colors are effective in capturing people's attention, aligning with their needs in both work and life.

In terms of product category preferences in product design, respondents below 20 years old tend to prefer stationery designs. Individuals in this age group are typically students, and they have higher demands for learning and growth. Therefore, they prioritize products designed for study and utility. Stationery products such as pens, notebooks, and folders meet their needs for learning and daily record-keeping. Respondents aged 20-40 and 41-60 both prefer designs for clothing and daily accessories products. Individuals in these age groups usually place more

emphasis on their appearance and the quality of daily life. They prefer to choose products that relate to their image and lifestyle. Clothing and daily accessories products such as T-shirts, hats, and scarves can showcase their personality and taste. Respondents 60 years old and above prefer designs for daily necessities and home decorations. Individuals in this age group prioritize the practicality and convenience of daily life. Therefore, they prefer to select products closely related to their daily lives. Household items such as cups, bowls, and utensils meet their basic daily living needs.

In terms of purchasing purposes, respondents below 20 years old primarily purchase products for daily use. Individuals in this age group are typically students, and they purchase products mainly to meet their daily life and study needs, such as buying stationery, household items. Respondents aged 20-40 mainly purchase products for Commemorative significance and fashion accessories. Individuals in this age group usually place more emphasis on their life experiences, memories, and daily functional needs. They may purchase products to commemorate a special day or event, such as buying souvenirs, travel mementos. Respondents aged 41-60 mainly purchase products for gift-giving and fashion accessories. Individuals in this age group prioritize interpersonal relationships and social activities. They may purchase products to give to others as gifts or for daily fashion accessories, such as buying gifts, souvenirs. Respondents 60 years old and above purchase products primarily for daily use and home decoration. Individuals in this age group typically prioritize the practicality and convenience of life. They purchase products mainly to meet their daily living needs, such as buying household items, home decorations.

Table 9. Age and each factor classification summary analysis table.

Variable	Age			
	Below 20 years old	20-40 years old	41-60 years old	60 years old and above
Integration of cultural heritage and innovation	4.409	4.464	4.405	4.200
Reflects auspicious symbolism	2.606	3.889	3.889	4.846
Designed to be exquisite patterns	2.455	3.991	4.632	4.262
Clear and distinctive features	2.697	4.587	4.274	3.231
Fashionable and uniquely designed	3.500	4.323	3.653	2.815
interestingness	4.879	3.600	3.384	2.569
Colors that match the cultural themes	4.576	3.945	3.868	4.815
Bright and visually impactful colors	2.227	4.328	4.484	2.831
Clothing and daily accessories products	2.545	4.383	4.521	2.938
Stationery	4.682	3.647	3.611	2.677
Daily necessities	2.470	3.706	3.663	4.785
Home decoration	1.955	3.740	3.616	4.754
Daily use	4.697	3.902	4.042	4.754
Commemorative significance	3.939	4.183	4.216	4.154
Gift-giving	2.682	3.864	4.416	3.046
Home decoration	1.727	3.553	3.458	4.677
Fashion accessories	1.727	4.166	4.368	2.677

Thus, this part reveals the differences of people of different ages in product design feature preference, product design color preference, product design category preference and purchase purpose. These findings have important guiding significance for the designers of cultural and creative products, they should choose the appropriate product design scheme according to the age and needs of the target consumers, so as to better meet the market demand.

h) Finally, regarding the open-ended question "Do you have any suggestions for the design and application of Hongshan culture pottery patterns in cultural and creative products?" Respondents provided various suggestions for the design and application of Hongshan culture pottery patterns in cultural and creative products. These suggestions can be summarized as follows: ① Novelty in pattern design: It is crucial for the patterns to be innovative, as finding interesting ways to integrate traditional pottery patterns with modern aesthetics is important. ② Preservation of cultural elements: Preserving the original cultural elements is more important than

excessive innovation. ③ Distinctive patterns: Designing unique patterns, such as observing pottery patterns from a child's perspective, is a good approach. ④ Clear and distinctive features in pattern design: Patterns should not only showcase Hongshan culture pottery designs but also allow people to easily understand and appreciate all patterns. ⑤ Vibrant colors in fashion and accessories: Clothing and accessories cultural and creative products are the most easily accepted by everyone, but must not be very traditional color, must be bright colors, fashion trends, and cultural elements are best at a glance, very intuitive presentation on the clothing, so that not only to meet the needs of people wearing fashion, but also very intuitive cultural elements spread out. ⑥ Fun and interesting stationery products: There are interesting stationery, similar to notebooks, pens, both commemorative significances, the use of daily life is also very high. It must be an interesting design, not a simple pattern repetition. ⑦ Clear cultural attributes: It can show cultural attributes at a glance, bright colors are not only easy for everyone to remember and more in line with modern aesthetic, clothing category of cultural and creative products will make people use more, the real can be achieved in line with cultural inheritance, but also let people in the daily life of the real use, rather than just tourist attractions or museums bought pieces, just placed at home. ⑧ Exquisite cultural creative products: Whether for daily wear or gifting, products should be exquisitely designed with unique colors. Scarves are suggested as an excellent carrier for cultural creative products due to their versatility. ⑨ Auspicious pattern designs: Design patterns have auspicious meaning is very important, need to be used in daily life, and also have decorative significance of cultural creative products, should also be in the preservation of the beauty of the pattern itself on the basis of redesign, don't always pursue modern design and lose the beauty of the pattern itself.

As shown in Figure 6, Respondents generally believe that combining tradition and modernity, highlighting characteristics and portability, reflecting broad and profound and heritage value, highlighting national characteristics, vigorously promoting and inheriting, innovative design, and designing more tourism products for the market and audience. These suggestions help to better design and apply the pottery patterns of Hongshan culture in cultural and creative products, so as to promote the inheritance and development of Hongshan culture.



Figure 6. Viewpoint vocabulary.



## 5. DISCUSSION

Based on research, the finest characteristic design of Hongshan culture that fit into creative product design can be summarized as follows:

For below 20 years old, their preferences regarding the design and application of Hongshan culture pottery patterns in cultural and creative products tend to prioritize interestingness and fashionable and uniquely designed. They lean towards colors that match the Hongshan cultural themes. Additionally, they show a preference for stationery products among the categories of cultural and creative products, and their purchasing intent is primarily geared towards daily usage. Therefore, for this age group, Hongshan culture pottery patterns should be designed with novelty and uniqueness in mind while maintaining traditional cultural color schemes. These patterns should be applied to stationery products that are practical for daily use.

For 20-40 years old, their preferences regarding the design and application of Hongshan culture pottery patterns in cultural and creative products tend to clear and distinctive features and fashionable and uniquely designed. They prefer bright and visually impactful colors. Among the categories of cultural and creative products, they lean towards clothing and daily accessories. Their purchasing purpose is primarily driven by commemorative significance and fashion accessories. Therefore, for this age group, Hongshan culture pottery patterns should be designed to be clear, distinctive, and fashionable, unique, using bright and visually impactful colors. These patterns should be applied to clothing and daily accessories cultural and creative products that are suitable for daily wear and possess commemorative significance, such as T-shirts and hats.

For 41-60 years old, their preferences regarding the design and application of Hongshan culture pottery patterns in cultural and creative products lean towards designed to be exquisite patterns. They prefer color schemes that are bright and visually impactful. Among the categories of cultural and creative products, they gravitate towards clothing and daily accessories. Their purchasing purpose is primarily driven by gift-giving and fashion accessories. Therefore, for this age group, Hongshan culture pottery patterns should be designed to be exquisitely detailed, utilizing bright and visually impactful colors. These patterns should be applied to clothing and daily accessories cultural and creative products that are suitable for daily wear and possess a sense of sophistication suitable for gift-giving, such as exquisite silk scarves.

For 60 years old and above, their preferences regarding the design and application of Hongshan culture pottery patterns in cultural and creative products lean towards patterns with reflects auspicious symbolism. They prefer colors that match the Hongshan cultural themes. Among the categories of cultural and creative products, they gravitate towards daily necessities and home decorations. Their purchasing purpose is primarily driven by daily use and home decoration. Therefore, for this age group, Hongshan culture pottery patterns should be designed with auspicious meanings, while use traditional cultural color schemes. These patterns should be applied to cultural and creative products suitable for daily use and home decoration, such as tableware sets, tea sets, and decorative plates.

## 6. CONCLUSION

Researcher delve into the most representative and unique design characteristic of Hongshan culture pottery patterns, as well as the application demands and thoughts of different demographics regarding these features in cultural creative product design. Through the analysis of data, we have summarized recommendations for creative product design that best encapsulate the distinctive characteristics of Hongshan culture. These design features encompass preferences across different age groups, pattern design characteristics, color preferences, product category preferences, and purchasing purpose. For design suggestions are proposed to meet the needs and preferences of various age groups for cultural creative products. The findings of this investigation serve as crucial references for the design and application of Hongshan culture pottery patterns in cultural creative products, thereby fostering the inheritance and development of Hongshan culture.



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