



RESEARCH ARTICLE

The Enlightenment of Bai Ethnic Residential Architecture Art Decoration on Modern Design under the Background of Multimedia Art

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ABSTRACT

The surrounding screen art in Dali Bai ethnic residential architecture can be regarded as a brilliant gem in China's architectural art, reflecting the distinctive ethnic characteristics of the local area and people's reverence for a better life. Studying the Bai ethnic surrounding screen is of great significance for traditional architectural culture. The aim of this study is to explore the inspiration of Bai ethnic residential architectural art decoration on modern design in the context of multimedia art. The Bai ethnic residential architecture is renowned for its unique cultural traditions and artistic style, and the artistic decorative elements in it may provide valuable inspiration in the field of contemporary design. By leveraging the tourism platform of a certain city, representative cultural elements of Bai ethnic residential architecture, such as decorative symbols, can be applied to the design of tourism cultural and creative products. This can not only enhance the cultural taste of tourism products, create a rich cultural atmosphere for the city, but also spread the Bai ethnic residential architectural culture, allowing the traditional culture of Dali to develop and inherit through inheritance and development. The results showed that the number of respondents who could accurately select Dali Matou Wall was the highest, with 430 people, accounting for 77.06% of the total sample size; Next are the flower windows outside the Dali buildings, with 394 people, accounting for 70.61% of the total sample size; Next is the gate tower in Dali, with 336 people choosing this option, accounting for 60.22% of the total number of people; Then there is the courtyard in Dali, which symbolizes "Four Waters Returning to the Hall", with 45.88% of the people choosing this option; Finally, there is the unique decorative symbol Screen wall in Dali. Only 25.45% of the total number of people can choose this option, indicating that tourists in a certain city have a lower awareness of Screen wall. In summary, the multimedia art decoration of Bai ethnic residential buildings provides rich inspiration for modern design, and provides useful references for designers to inject more cultural heritage and artistic emotions into the creative process. Through in-depth research and innovative application, we can expect to see the perfect integration of Bai traditional culture and multimedia art in modern design, injecting new vitality into the field of design.

1 INTRODUCTION

Since the reform and opening up, especially in the more than 20 years since joining the WTO, the Chinese economy has entered a fast lane of rapid development, and the living standards of the people have greatly improved. Coupled with the increasingly frequent and close

cultural exchanges with foreign countries, especially the West, the values and aesthetic orientation of the Chinese people have been constantly evolving. The development of China's construction industry, like other industries, is also gradually evolving with the development and changes of social economy, political system, culture, and aesthetics. It has also undergone a process of germination, development, and gradual maturity (Olga et al., 2020). For a long time, traditional Chinese architecture has been the mainstream model of Chinese architecture, widely present in various forms of architecture in China. With the implementation of China's reform and opening up policy in 1978, the process of modernization in China accelerated, especially after China's accession to the WTO. China has increasingly integrated with other countries around the world in the fields of economy, politics, and culture. China's construction industry has truly entered a track of rapid development, and is fully influenced by foreign architectural ideas in terms of form, materials, technology, culture, and other aspects. For over 30 years, driven by the economy and urbanization process, China's construction industry has flourished and has become one of the pillar industries in China. The rapidly developing construction industry has brought qualitative changes and improvements to people's lifestyles, and has brought earth shaking changes to our living environment. The rise of cities, spacious roads, and beautiful new countryside have all witnessed the great achievements of China's construction industry, completely changing the face of China and updating the world's perspective on China. However, while enjoying a high-quality life, we are also increasingly aware of the increasingly obvious similarities, indifference, extremism, and lack of national cultural identity brought about by industrialization and standardization concepts in the field of contemporary Chinese architecture (Zhang, Lu, 2021). The development of China's construction industry has gone through two extreme processes, namely the slow and unchanging development before 1978 and the rapid and explosive development after the reform and opening up.

In contemporary society, design, as a comprehensive discipline of art and engineering, is increasingly influenced and inspired by multimedia art. The emergence of multimedia art has brought broader creative space and diverse forms of expression to design. In this context, various cultural and traditional artistic elements have become important sources of design inspiration. This study focuses on the artistic decoration of Bai ethnic residential architecture, attempting to explore its implications for modern design in depth. The architecture of Bai ethnic dwellings has attracted much attention due to its unique cultural traditions and artistic design. The artistic decorative elements in its architecture, such as murals, carvings, embroidery, etc., carry rich cultural connotations and showcase the unique understanding of nature, history, and life of the Bai people. These decorations are not only embellishments on the surface of buildings, but also a continuation and inheritance of culture, presenting a unique charm of the integration of multimedia art and traditional culture. In the era of multimedia art, designers pursue breakthroughs in traditional creative methods and seek innovative and profound design inspiration. The artistic decoration of Bai ethnic residential buildings provides a rich creative treasure trove for the design field due to their diversity, richness, and cultural connotations. This study aims to explore the design philosophy and aesthetic concepts contained in Bai ethnic residential architecture through in-depth analysis, in order to inject more humanistic elements into modern design and promote the diversified development of design. Through the integration and collision of multimedia art and Bai ethnic architectural decoration, we are expected to discover a new design paradigm that can not only retain the unique charm of traditional culture, but also adapt to the pursuit of innovation and diversity in contemporary society (Khan et al., 2021). Therefore, this study will deeply analyze the artistic decoration of Bai ethnic residential architecture from multiple perspectives, explore its inspiration for modern design, and provide designers with new creative ideas and design concepts (Aisse, 2019; Pane et al., 2021).

2 LITERATURE REVIEW

Yang,C believe that driven by China's economic development, the development of information technology is in the ascendant, and the derivative digital media technology has also been popularized. As a product of the times, digital media art is in the stage of vigorous

development. Digital media art is full of diversified development trends and has been deeply implemented and respected in the popular integrated design (Yang, 2020). Thi, N. D. is studying the application of topological geometry in the process of architectural conceptual design, and combining it with modern digital technology to find new architectural spaces and forms that are dynamic and easy to adapt to the environment and background. Design/Methodology/Methods This paper adopts the method of studying the existing topological geometry and architectural design theory literature, including design thinking, architectural design methods and architectural composition, analyzes and compares them with architectural practice, and proposes new topological design tools and methods (Thi, Thuy, 2022). Samhour, M proposed an automatic multi category damage detection technology based on convolutional neural network (CNN) model of image classification and feature extraction, which is used to detect the damage of historical buildings, such as erosion, material loss, stone color change and damage. This study chooses the city of "Al Sort" in Jordan as a case study. The best model shows that the average damage detection accuracy is 95% (Samhour et al., 2022).

Based on a systematic study of Dali's history and culture, natural conditions and social culture, this article, starting from the perspective of semiotics, specifically classifies and analyzes the composition of Dali architectural decorative symbols, and then deconstructs and reorganizes them, trying to take their "form", pass on their "spirit" and extend their "meaning", so as to fully explore their deep cultural connotation and spiritual thoughts.

3 RESEARCH METHODS

3.1 Multimedia art background

There are many forms of expression of multimedia art, and the common point is that users change the sound, light, image, shape, meaning of the work through direct interaction with the work, and promote the transformation of the work in different ways. Multimedia art is not only interactive, but also connected. Connectivity means that multimedia art connects people all over the world. People at each information terminal are connected with others and works through the network (Chen et al., 2021). It can be said that interactivity and connectivity are the more prominent characteristics of multimedia art. The digitalization, modularization, automation, changeability and translatable coding of modern multimedia technology provide the possibility for the connection and interaction between machine and human. Multimedia artists make the human-computer dialogue barrier-free by coding, arranging and combining, using the control of the program, the mutability of digital technology and the preset of the program. One of the biggest differences between modern multimedia art and traditional art lies in the transformation of interactive function, which has laid the era advantage of modern multimedia art (Figure 1).

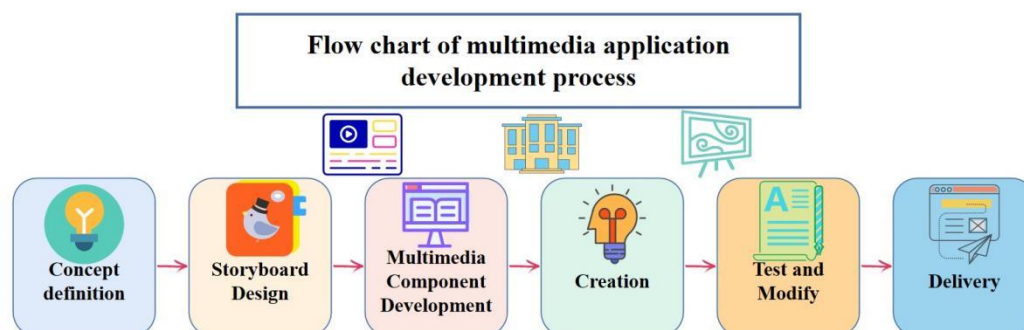


Figure 1 Flowchart of multimedia application development process

3.2 Production Technology of Surrounding Screens in Dali Bai Ethnic Residential Buildings

(1) Inlay

Marble, which has strong waterproof and sunscreen properties, is sturdy and earthquake resistant, and comes with its own patterns and colors, is a frequently used decorative element in Bai ethnic dwellings. In the surrounding screen, there is always the presence of marble. Usually, marble is embedded in the center of the screen, or in a circular or quadrilateral shape, using the original color of marble to add a rustic texture to the screen. Although the marble used in the screen may appear to be cut into regular shapes, the actual process is far from that, at least it needs to go through processes such as washing and polishing. In addition to embedding marble in the center of the screen and the upper frame of the screen, it is also common to use inlay techniques to embed porcelain in the screen frame of Bai ethnic residential buildings, which can enhance the cultural atmosphere of the screen (Lewis et al., 2019; Belli, 2020).

(2) Clay sculpture

Ceramic sculpture, gray sculpture, clay sculpture, and carving are commonly used decorative techniques in Dali Bai ethnic dwellings. Among them, the difficulty of clay sculpture is relatively more complex, and the layers of steps such as composition, framing, clay sculpture, air drying, and painting all test the craftsman's skills. The craftsman first needs to draw a pattern, using bamboo or wood to create a complete skeleton, and then using the prepared soil to design various images. After the soil dries, the prepared paint is used for coloring. Clay sculpture makes the image in the screen more realistic, with bright colors, enhancing the decorative effect of the screen (Luo et al., 2020).

(3) Paintings

Color painting is a common decorative technique in the surrounding screens of Bai ethnic houses, which involves either painting on already carved decorative themes or directly drawing decorative patterns on materials. In architectural decoration paintings, the composition of colored paintings is generally bright and simple, with clear priorities. The background is often composed of natural scenery with fresh colors or rich layers, and the main surface is mostly composed of quiet and elegant gray and dark green. In the surrounding screens of Bai ethnic houses, in order to prevent color fading, it is necessary to lay a foundation for the color paintings. Usually, pre made lime paste is used to make paper pulp and ash, and painting can only be done when it is semi dry, so as to prevent the color from fading easily.

(4) Carving

The traditional stone carvings of the Bai ethnic group in Dali were all completed by local craftsmen themselves, showcasing their superb skills from the initial design of the artwork to the final carving. The stone carving process includes steps such as material selection, land reclamation, and fine grinding. Firstly, consider the texture, color, size, and other factors to select suitable stones based on the placement environment, styling style, and artwork specifications; Secondly, remove the excess part of the stone material until a preliminary outline is obtained, and then chisel out the basic shape of the body and surface; Once again, meticulously carve, identify the undulating structure of the form, and focus on depicting the image; Finally, polish the stone carving to make it more textured. The stone carvings in the surrounding screens of Bai ethnic houses in Dali are mostly auspicious symbols such as lions, dragons, phoenixes, water ripple patterns, cloud patterns, lotus flowers, etc. Due to the need to stabilize the building facade as much as possible and enhance seismic resistance, these types of bricks and stones have a relatively large shape. When carving, the details are relatively weak and cannot be finely carved, but they give people a simple and stable texture.

(5) The wall technology of integrating stone and brick

The Bai ethnic group in Dali gradually developed the stone brick integrated wall technology in order to make the wall more beautiful and sturdy, and this technology was also applied to the surrounding screen. There are a large number of veneer bricks in the Dali area, which are thinner than ordinary wall bricks and have various shapes and corresponding wooden molds.

When building walls, it is required to have a smooth and neat appearance, while the printed bricks used in the screen are even more stringent. The wooden molds should have specific patterns, such as auspicious styles such as blessings, longevity, and plum blossoms, orchids, bamboo, and chrysanthemums. The workmanship of this type of wooden mold must be fine, and there are strict requirements for the humidity and purity of the brick mud. In addition, the firing process of printed bricks also requires the skills of craftsmen. Therefore, the number of printed bricks in the local area is relatively small, and the use of printed bricks can make the decoration of the screen more textured (Luo, Dong, 2021).

3.3 Design and distribution of the questionnaire for domestic tourists in a city

3.3.1 Questionnaire design

Based on the analysis and collation of domestic and foreign data, combined with the development status of tourism commodities in a city, the attributes of tourism commodities that affect tourists' shopping preferences are divided into 16 aspects: color, material, style, price, quality, packaging, brand, service, uniqueness, easy to carry, practicality, local characteristics, cultural connotation, production process, commemorative significance, and suitable for gifts. On this basis, the preliminary design of the questionnaire was carried out. The second part is the survey of the respondents' tourism shopping preferences, which specifically includes the respondents' purchase intention of tourism commodities, the acceptable price of a single tourism commodity, the proportion of tourism shopping expenditure in the total expenditure, the purchase motivation, the purchase place and the preference of the attributes of tourism commodities in the process of tourism. The higher the score, the more important the respondents think this attribute of tourism commodity (Nezam et al., 219). The third part is the survey of the recognition of the decorative symbols of Bai ethnic dwellings architecture.

After the design of this questionnaire, a pre-survey was conducted on 30 tourists in a city. The subjects of the pre-survey were 15 males and 15 females, aged from 15 to 60 years old. Most of them had bachelor's degree and junior college degree, accounting for 48.62%. The monthly income is mostly concentrated in 3000~5000, accounting for 52.38%. The reliability analysis of the Cronbach α coefficient of the attitude scale of tourism commodity attribute preference was conducted by SPSS (Table 1). Reliability, also known as reliability, refers to the consistency and stability of the scores measured by a questionnaire, or the accuracy with which respondents express their opinions. The reliability analysis of the pre-survey questionnaire is the key to controlling the survey error, ensuring the consistency and validity of the questionnaire survey measures (Yin, Lu, 2021). According to the relevant evaluation criteria, Cronbach α value lower than 0.35 in exploratory studies is considered as low reliability and must be rejected. If the reliability is greater than or equal to 0.35 and less than 0.7, it belongs to the general reliability and needs to be further modified. If α reaches 0.7, it is acceptable. If α exceeds 0.8, it indicates that the data has high reliability. According to the verification results, the Cronbach α coefficient was 0.875, indicating that the questionnaire had high reliability.

Table 1 Reliability analysis of tourism commodity attribute preference scale

Cronbach's Alpha	N of Items
0.875	16

In addition, through in-depth conversation with the respondents and consultation of the deficiencies or incomprehensibility of the questionnaire, some words in the questionnaire were modified in a more general way, so that the respondents could better understand them and provide guarantee for the correctness of the subsequent analysis and research. It is especially

emphasized that the results of this preliminary survey are not included in the final survey results.

3.3.2 Distributing Questionnaires

The questionnaire survey adopted the method of random sampling and was distributed in the tourist attractions of a city. In terms of sample size, this article hopes to use factor analysis method to analyze the scale data. Factor analysis requires that the sample size N is 5-10 times of the index size of the questionnaire. The index size of this questionnaire is 16, so the sample size should reach 80-160. Then, the following statistical formula (1) is used to infer the sample size from simple random sampling:

$$n = t^2 p(1 - p) / e^2 \quad (1)$$

Finally, a total of 600 questionnaires were distributed. The questionnaire was distributed in two stages. The first stage was in May 2023, and the second stage was from July to August 2023. The domestic tourists who came to were randomly selected from several scenic spots in a city to conduct the questionnaire survey, so as to ensure the breadth of the survey population. In addition, in order to ensure the authenticity and accuracy of the data, the questionnaires were distributed in the rest places of scenic spots and on tour buses to ensure that the respondents could have enough time to fill in. Finally, a total of 584 questionnaires were collected, among which 558 were valid (excluding those with high vacancy rate or all choosing the same option), and the effective rate of the questionnaire was 93%.

4 RESULT ANALYSIS

4.1 Data processing and analysis of the questionnaire

4.1.1 Demographic characteristics analysis of domestic tourists in a city

Through the analysis of the demographic characteristics of domestic tourists in a city, it can be seen that tourists to are mostly concentrated in the group of young and middle-aged people with high education and middle income, which is consistent with the current development of tourism in China. This group of people is characterized by active thinking, independent thinking, high pursuit of life quality, and a certain amount of discretionary income, so they travel relatively more times and have higher requirements for tourism commodities (Yu, 2021). Therefore, the design and development of tourism products in tourism shopping market should focus on showing its own local characteristics, convey the unique regional culture of Dali, and do a good job in marketing for this part of the population.

(1) Gender analysis

From the perspective of gender, the overall gender composition is relatively balanced. As show in table 2, 256 male tourists are interviewed, accounting for 45.88% of the total number surveyed in the questionnaire, while 302 female tourists are interviewed, accounting for 54.12%. The overall distribution is relatively balanced, with slightly more females than males, and the gender distribution of the sample size is reasonable.

Table 2 Sample gender analysis table

Covariance item	classification	Sample size	percentage (%)
Gender	Male	256	45.88
	Female	302	54.12

(2) Age analysis

In terms of age, the interviewed tourists are mainly aged 15-45, accounting for 80.64%. As show in table 3,the proportion of tourists aged 15-25 is the highest (40.86%), the proportion of tourists aged 26-45 is the same (39.78%), followed by tourists aged 46-60 (12.9%), and those aged 61 and above and 14 and below (3.95% and 2.51%), respectively. It can be seen that young and middle-aged people aged 15-45 are the main tourist groups in a city, so it is necessary to pay attention to the shopping preferences of these two groups and do a good job in marketing.

Table 3 Statistical items of sample age analysis table

Covariance item	classification	Sample size	percentage (%)
Age	Age 14 and under	14	2.51
	15 ~ 25 years old	228	40.86
	26~45years old	222	39.78
	46~60years old	72	12.9
	Age 61 and above	22	3.95

(3) Education level

As show in table 4,from the perspective of education level, the survey results show that more than half of the respondents have bachelor's degree and junior college degree or above, accounting for 67.38%, among which the majority are bachelor's degree and junior college degree, accounting for 56.27%, while the tourists with master's degree or above account for 11.11%. The composition of education level is relatively reasonable. The second is high school and technical secondary school tourists, accounting for 20.43%, junior high school and below 12.19%. Most of the tourists in have a college or a bachelor's degree or above, and this part of the population has a stronger demand for culture and a more strict aesthetic requirement. Therefore, the design of tourism commodities should be removed from the tacky, and more pursue local regional characteristics and historical and cultural connotation.

Table 4 Analysis Table of sample education level

Covariance item	classification	Sample size	percentage (%)
degree of education	Junior high school and below	68	12.19
	High school and technical secondary school	114	20.43
	Undergraduate and Junior College	314	56.27
	Postgraduate and above	62	11.11

(4) Income situation

As show in table 5,from the perspective of monthly income, the middle income group with monthly income of 1500 to 5000 is relatively large among the respondents, accounting for about half of the survey number, 52.33%, followed by the group of less than 1500 yuan, accounting for 20.07%, the group of 5000 to 8000 yuan accounted for 15.05%, and the group of 8000 yuan and above accounted for 12.55% (Li et al., 2020).

Table 5 Sample monthly income analysis table

Covariance item	classification	Sample size	percentage (%)
Monthly income	1,500 yuan and below	112	20.07
	1500~3000yuan	128	22.94
	3000~5000yuan	164	29.39
	5000~8000yuan	84	15.05
	8000yuan and above	70	12.55

4.2 Analysis of shopping preferences of domestic tourists in a city

4.2.1 Purchase intention analysis

As show in table 6,the survey results show that in the process of tourism, 228 respondents are willing to buy tourism commodities, accounting for 40.86%, 70 respondents are not willing to buy tourism commodities, accounting for 12.54%, and nearly half of the respondents say that it depends on the situation, 260 people, accounting for 46.6%. According to the above data, only a small number of tourists are not willing to buy tourism commodities in the process of tourism to. Most tourists are willing or have the intention to buy tourism commodities, but the tourism commodities in may not meet the expectations of tourists, so nearly half of them are hesitant (Lai, Yang, 2021).

Table 6 Sample purchase intention analysis table

Covariance item	classification	Sample size	percentage (%)
Purchase intention	Willing	228	40.86
	Unwilling	70	12.54
	It depends	260	46.60

Due to the differences in demographic characteristics such as gender, age, education level and income, there may be some differences in the purchase intention of different tourists. Therefore, this study uses SPSS to conduct cross-contingency table chi-square test on purchase intention and these four demographic characteristics to test the correlation between purchase intention and them.The results in Table 7 show that the number of grids with expected frequency less than 5 is 0, indicating that the result of chi-square test is valid. Moreover, the P value of two-sided approximate probability is greater than 0.05, indicating that the null hypothesis of no correlation between the two cannot be rejected, that is to say, purchase intention is not correlated with gender. The results in Table 8 show that the two-sided approximate probability P values are all greater than 0.05, accepting the null hypothesis that there is no correlation between purchase intention and tourists' age, education level and monthly income.

Table 7 Chi-square test results of purchase intention and gender

		gender
Purchase intention	Pearson	.948a
	Chi-Square	
	Asymp. Sig	.624
	(2-sided)	

Note: a. There are 0 cells (0.0%) with the expected frequency less than 5. The minimum expected frequency is 16.02.

Table 8 Likelihood ratio chi-square test results of purchase intention and three demographic characteristics

		Age	degree of education	Monthly income
Purchase intention	Likelihood	4.828	6.436	11.129
	Ratio			
	Asymp. Sig.	.777	.377	.196
	(2-sided)			

4.2.2 Accept price analysis of individual items

Tourists' ability to bear commodity prices is one of the important factors affecting the design, development, production and marketing of tourist commodities. This questionnaire investigates the price of a single tourist commodity that tourists can afford in a city, as shown in table 9. To a certain extent, it reflects that tourism commodities should be closer to the public and should not be set too high when making market price positioning. However, this does not mean that tourists will choose to buy commodities when the price is low and the cost performance is low.

Table 9 Sample acceptable price analysis of a single item

Covariance item	classification	Sample size	percentage (%)
Single item price accepted	Under 50 yuan	134	24.01
	50-100yuan	220	39.43
	100-300yuan	136	24.37
	300-500yuan	44	7.89
	above 500 yuan	24	4.3

The price of a single item that tourists can accept is correlated with gender, age, education level and monthly income. Since gender and education level are qualitative variables, Spearman rank correlation coefficient was used to analyze the relationship between them and the price of a single commodity that tourists can accept. However, monthly income and age are quantitative variables. In order to ensure more accurate results, Pearson correlation coefficient is used for correlation analysis. The results (Table 10) show that the Spearman correlation coefficient between the price of a single tourism commodity acceptable to tourists and gender is -0.157, and the two-sided significance value of no correlation between them is $0.013 < 0.05$, indicating that there is a correlation between them at the significance level of 0.05, and it is a weak negative correlation (Huang, Wu, 2019). The Pearson correlation coefficient between age, the price of a single tourist commodity that tourists can accept and gender is 0.194, and the two-sided significance value of uncorrelated between them is $0.002 < 0.01$, indicating that they are correlated at the significance level of 0.01, and the correlation is weak and positive. The Spearman rank correlation coefficient between the education level and the single tourism commodity that tourists can accept is -0.267, and the significance value of uncorrelation between them is $0.000 < 0.01$, indicating that they are correlated at the significance level of 0.01, and the correlation is weak and negative. However, the Pearson correlation coefficient between monthly income and the single tourism commodity that tourists can accept is 0.357, and the uncorrelated significant coefficient between them is 0.000, indicating that they are correlated at the significance level of 0.01, and the correlation is low and positive.

Table 10 Correlation Analysis of receiving individual commodity price and four demographic characteristics(N=558)

		age	Monthly income		gender	degree of education
Accept the price of each	Pearson Correlation	.194**	.357**	Correlation	-.157	-.267**
				Coefficient		

item	Sig.	.002	.000	Sig.	.013	.000
	(2-tailed)			(2-tailed)		

Note: ** indicates significance at 0.01 confidence level, * indicates significant correlation at 0.05 confidence level, same as below

Further analysis was made on the price distribution of a single tourism commodity acceptable to people of different genders, ages, educational backgrounds and monthly incomes. The results (Table 11) showed that:

Table 11 Sample can accept a single commodity price distribution table

Demographic Characteristics		Less than 50 yuan	50100 yuan	100300 yuan	300500 yuan	more than 500yuan	Total	
Gender	Male	52	84	76	24	20	256	
		20.31%	32.81%	29.69%	9.38%	7.81%	100%	
	Female	82	136	60	20	4	302	
		27.15%	45.03%	19.87%	6.62%	1.32%	100%	
Age	Age 14 and under	10	4	0	0	0	14	
		71.43%	28.57%				100%	
	15~25 years old	82	104	32	8	2	228	
		35.96%	45.61%	14.04%	3.51%	0.88%	100%	
	26~45 years old	36	92	80	8	6	222	
		16.22%	41.44%	36.04%	3.60%	2.70%	100%	
	46~60 years old	6	16	16	22	12	72	
		8.33%	22.22%	22.22%	30.56%	16.67%	100%	
	Age 61 and above	0	4	8	6	4	22	
			18.18%	36.36%	27.27%	18.18%	100%	
	degree of education	Junior high school and below	12	18	22	10	6	68
			17.65%	26.47%	32.35%	14.71%	8.82%	100%
High school and technical secondary school		20	52	28	6	8	114	
		17.54%	45.61%	24.56%	5.26%	7.02%	100%	
Undergraduate and Junior College		76	124	78	28	8	314	
		24.20%	39.49%	24.84%	8.92%	2.55%	100%	
Postgraduate and above		26	26	8	0	2	62	
		41.94%	41.94%	12.90%		3.23%	100%	
Monthly income		1500 yuan and below	54	36	22	0	0	112
			48.21%	32.14%	19.64%			100%

1500~3000 yuan	24	76	20	8	0	128
	18.75%	59.38%	15.63%	6.25%		100%
3000~5000 yuan	32	62	50	16	4	164
	19.51%	37.80%	30.49%	9.76%	2.44%	100%
5000~8000 yuan	20	28	24	6	6	84
	23.81%	33.33%	28.57%	7.14%	7.14%	100%
8000 yuan and above	4	18	20	14	14	70
	5.71%	25.71%	28.57%	20%	20%	100%

(1) In terms of gender, compared with men, women are significantly more likely to accept a single commodity with a price below 100 yuan. When a single commodity reaches more than 500 yuan, men are the majority of people who can accept it.

(2) In terms of age, it can be seen from the previous data that 80.64% of tourists in a city are aged 15-45. Among them, the price of a single product that young people aged 15 to 25 can accept is mostly under 100 yuan. Accounting for 80.57% of its total number; However, the price of goods accepted by the young and middle-aged people aged 26-45 is mainly in the range of 50-300 yuan, accounting for 77.48% of the total number of them. Among them, 41.44% are 50-100 yuan, and 36.04% are 100-300 yuan.

(3) In terms of educational level, most of the commodity prices that can be accepted by graduates or above are less than 100 yuan, accounting for 83.88% of the total number; Undergraduate and junior college students were mostly concentrated under 300 yuan, accounting for 88.53%, and distributed evenly in these three price ranges. High school and technical secondary school people can accept the price of a single commodity in the range of 50 to 100 yuan, accounting for 45.61%.

(4) In terms of income level, the price of a single commodity that can be accepted by people with a monthly income of less than 1,500 yuan is concentrated at less than 300 yuan; People with a monthly income of 1500-3000 yuan chose the commodity price of 50-100 yuan, accounting for 59.38% of the total number of people. Monthly income in 3000~5000 yuan people also choose 50~300 yuan; However, for people with a monthly income of 8000 yuan or more, almost all of them choose a price of more than 50 yuan, and even 40% choose a price of more than 300 yuan. It can be seen that this group of people can relatively accept high-end products (Gojnik, 2019).

4.2.3 Preference analysis of tourist shopping places

Before purchasing tourist commodities, tourists always consider the place of purchase first. Moreover, most tourists hope to buy tourist commodities in the place of origin or with commemorative significance, so that the purchased commodities will be more memorable. Therefore, tourist places have become one of the important factors affecting tourists' shopping. Considering that tourists will have a variety of choices, this question is set as multiple choices. As shown in table 12, The results of the questionnaire show that the respondents choose to buy tourism products in the characteristic Bai ethnic dwellings architectural commercial street, accounting for 81.53% of the total number of people, which may be related to the characteristic 5A scenic spot of a city's old street; Tourist attractions followed, accounting for 45.38% of the total sample size; Then large shopping centers, accounting for 40.56% of the total; The number of people who chose other shopping malls, airports or stations, shops designated by travel agencies, and hotels was lower, with 9.64 percent, 9.24 percent, 8.84 percent, and 4.02 percent, respectively. The reasons may be related to the inability of these places to give tourists a sense of trust in the marketing of tourism products.

Table 12 Analysis Table of places for sample purchasing tourism commodities

Covariance item	classification	Sample size	percentage (%)
places to buy tourist goods	Tourist Attractions	254	45.38
	Characteristic Bai ethnic dwellings architecture Commercial Street	454	81.53
	Designated shops by travel agencies	50	8.84
	Hotel shopping mall	22	4.02
	Large shopping mall	226	40.56
	Airport or station	52	9.24
	Other	54	9.64

The chi-square test was conducted to test whether there were differences in the choice of tourist attractions, commercial streets with characteristic Bai ethnic dwellings architecture and large shopping centers with gender, age, education level and monthly income. The results show (Table 13) that the P value between age and tourist attractions is $0 < 0.01$, and the number of column links is 0.312, indicating that there is a low correlation between age and tourists' choice of tourist attractions as places to buy at a significant level of 0.01. The P values of education level, tourist attractions, characteristic Bai ethnic dwellings buildings and commercial streets are 0, less than 0.01. The column correlations are 0.274 and 0.289 respectively, both less than 0.3, indicating that there is a weak correlation between education level and them at the significance level of 0.01 (Zhang, 2019).

Table 13 Cross-contingency table analysis of places to purchase tourist goods and four demographic characteristics

		Tourist attractions	Characteristic Bai ethnic dwellings architecture commercial street	Large shopping center
Gender	Contingency	.045	.103	.045
	Coefficient			
	Sig.	.485	.105	.476
Age	Contingency	.312**	.189	.16
	Coefficient			
	Sig.	0	.068	.123
degree of education	Contingency	.274**	.289**	.153
	Coefficient			
	Sig.	0	0	.115
Monthly income	Contingency	.210*	0.12	.197
	Coefficient			
	Sig.	.022	.458	.041

Further analysis on the choice of tourist attractions as shopping places for tourists of different ages shows that (as shown in Figure 2), all tourists aged 61 and above choose tourist attractions as shopping places. The second is 15-25 year old tourists, only 63.10% of the total number of this age group; However, the number of tourists aged 46-60 who choose tourist attractions as shopping places accounts for the least proportion of the total number of tourists in this age group, only 15.8%, indicating that this part of the population has relatively low trust in shopping places in tourist attractions.

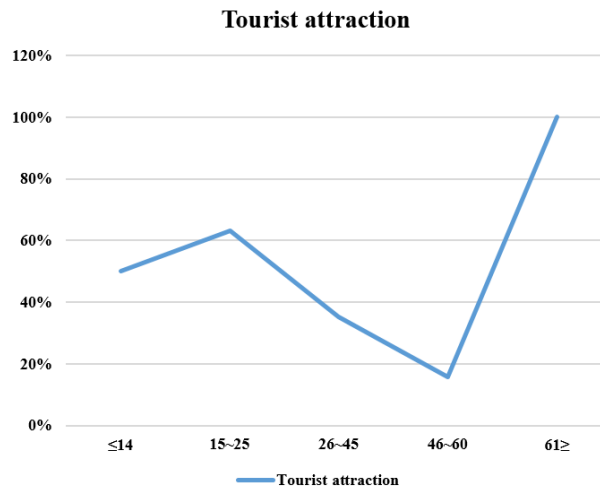


Figure 2 Proportion distribution of samples of different ages in the choice of tourist places

An analysis of the education level, tourist attractions and characteristic Bai ethnic dwellings architectural commercial streets as two types of shopping places shows (Figure 3) that in the selection of shopping places in tourist attractions, the proportion of the number of tourists with different education levels in the total number of educated people increases with their education levels. The proportion of junior high school and below choices is the least, and the proportion of postgraduate and above choices is the most. In the aspect of characteristic Bai ethnic dwellings architecture commercial street, it is generally high, except for high school and technical secondary school tourists choose the proportion of the total number of people with this degree is relatively small, only 60.60%. The proportion of tourists with other education levels is above 80%. The proportion of undergraduate and junior college tourists even reached 90.5%.

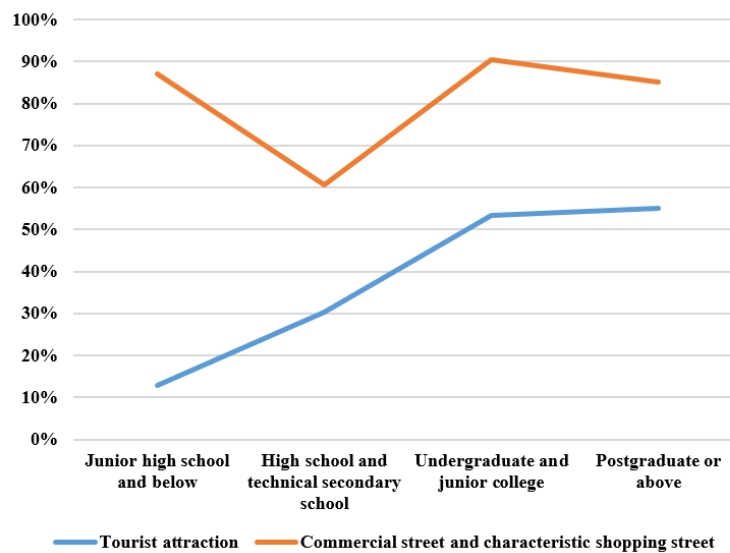


Figure 3 Proportion distribution of samples with different educational levels in the choice of tourist places

Further analysis of income, tourist attractions and large shopping centers (Figure 4) shows that compared with other income groups, 63.3% of people with a monthly income of less than 1500 yuan choose tourist attractions to buy tourist goods. The proportion of tourists earning more than 8,000 yuan per month was the least, at 25 percent.

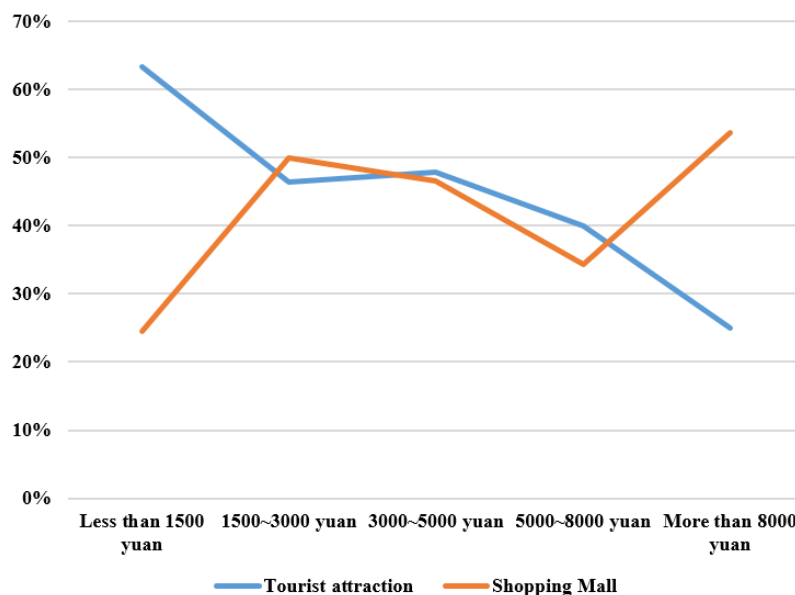


Figure 4 Proportion distribution of samples with different income levels in the choice of tourist places

4.3 A survey on the cognition of domestic tourists on the decoration symbols of Bai ethnic dwellings buildings in a certain city

In order to determine the level of recognition among tourists towards the decorative symbols of Bai ethnic residential buildings, this questionnaire selected elements such as horse head walls, "screen walls," door heads, and wooden carvings, and compared them with other architectural genres. These five symbols are mixed and superimposed by image symbols, indicative symbols and symbolic symbols, and it is impossible to tell which category they belong to definitively, just the number of components. Results Table 14 shows that the number of respondents who can accurately select Dali Horsehead wall is the largest, 430, accounting for 77.06% of the total sample size; The second is the flower window outside Dali buildings, with 394 people, accounting for 70.61% of the total sample size; Then came wood carving in Dali. 336 people chose this option, accounting for 60.22% of the total number; The second is the courtyard in Dali, which symbolizes "four waters return to the hall", with 45.88% of the total number of people choosing this option. Finally, there is the unique decoration symbol Screen wall in Dali. Only 25.45% of the total number of people can choose this option, indicating that tourists in a city have a low awareness of Screen wall.

Table 14 Survey results of sample recognition of Dali architectural decoration symbols

	horsehead walls	"Business" word door	doorstep	wood carving	Flower window
sample size	430	142	256	336	394
Percentage	77.06%	25.45%	45.88%	60.22%	70.61%

5 CONCLUSIONS

The artistic decoration of Bai ethnic residential buildings has brought profound inspiration to modern design in the context of multimedia art. Through the exploration of this study, we are able to glimpse the positive impact of this traditional cultural element on modern design, and draw many beneficial experiences and inspirations from it. The focus of this questionnaire is to study tourists' shopping preferences and related influencing factors in the process of tourism in a city, fully understand their expectations for tourism commodities in a city, and determine their cognitive degree of Bai ethnic dwellings architectural decoration symbols, so as to provide market data for the design of tourism commodities below.

From the perspective of demographic characteristics, domestic tourists in a city are mainly concentrated in the young and middle-aged people aged 15-45, with bachelor's degree or college degree or above, and with high education and middle and high income, with a monthly income of 1500-5000.

(2) In terms of the purchasing power of tourism commodities, tourists in a certain city basically have the intention to buy tourism commodities, but their consumption level is only maintained in the middle and low level, and most of them spend less than 20% of their total travel expenses on shopping during their trip to . Moreover, the price of a single tourism commodity they can accept is mostly concentrated below 300 yuan. Among them, for the young and middle-aged people with high education and middle and high income, the price is mostly concentrated in 50 to 300 yuan. Therefore, the market positioning of the product should be considered in the design.

(3) In terms of purchasing motivation, tourism commodities can be divided into three types according to the purchasing motivation of tourists. The vast majority of tourists are more inclined to buy tourism souvenirs, followed by tourism food, and finally daily necessities. And among these tourists, those with a college degree or above are more likely to buy souvenirs.

Overall, the artistic decoration of Bai ethnic residential buildings provides rich inspiration and inspiration for modern design. By combining traditional culture with multimedia art, designers have the potential to create works that are more profound and fashionable. This trend of cross-cultural integration in design will lead to a more open design field and drive innovation to new heights. Therefore, we encourage designers to deeply explore and apply the artistic decorative elements of Bai ethnic residential architecture in their creations, in order to enrich and enhance the quality of modern design.

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