

# Research on the Cultural and Creative Product Design of Huaqing Palace Based on AHP Method

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**Abstract:** By introducing various elements of Tang culture in Huaqing Palace, using AHP method to research and analyze them, discovering and organizing their genes as the most basic component units, classifying Tang culture elements, extracting typical Tang culture elements, establishing an evaluation model tree of Tang culture elements, then quantitatively determining the model tree, and finally analyzing the quantitative results, selecting the most popular three typical Tang culture elements for reasonable analysis, reorganization and creative transformation to design new products, thus proving the operability of Tang cultural elements in modern design.

**Keywords:** Cultural genes, Huaqing Palace, Tang Dynasty culture, Evaluation model tree, Hierarchical analysis method

## 1. Introduction

The design method model adopted in this paper is based on cultural genes to establish an evaluation model tree, extract the more critical design factors, and integrate culture with creative products, so as to design creative products with specific cultural elements, breaking the limited design approach of directly applying cultural elements to products in a rigid way.

## 2. Classification and selection criteria of Tang Dynasty cultural elements

### 2.1. Classification of Tang Dynasty Cultural Elements

Multi-cultural coexistence in Tang Dynasty, in the smooth flow of Silk Road, Tang culture continuously absorbed western culture<sup>[1]</sup> and fused into a culture suitable for its own development, which is a fusion of multi-ethnic characteristics and has high artistic value, among which, Tang architecture, art and pattern elements are the most characteristic, and the types and characteristics of Tang cultural elements are shown in Table 1 below.

**Table 1.** Types and characteristics of Tang cultural elements

Types of Tang cultural elements		Characteristics of Tang cultural elements
Architecture and Fine Arts	Architecture	The building layout is grand in scale, neatly planned, reasonably laid out, dignified and generous
	Mural	Exquisite techniques, diverse ornaments, gorgeous and full of Zen, mainly with Buddhist elements
	Clothing	Large use of floral patterns, sparse and dense, lively and free
	Painting	Mainly landscape, figure and bird and flower paintings
	Calligraphy	Mainly in running and cursive calligraphy, with a flying and floating style
Animal Patterns	Pisces	It represents harmony, prosperity and other auspicious symbols, and is also a sign of success
	Rui animal grape pattern	With a variety of rui beasts and grapes as the main elements, representing good luck
	Dragon pattern	A symbol of power, prestige, and success
Plant patterns	Treasure Phase pattern	Buddhist motifs with the meaning of "treasure" and "immortality"
	Curly grass pattern	Auspicious meaning of longevity and prosperity
Geometric patterns	Lianju pattern	Pairs of birds or beasts, with continuous round or oval beads as the picture
	Kamehameha, Ruyi	Variable shape, clear lines, transparent ground, symmetrical composition, bright and vivid colors

## 2.2. Selection criteria for scoring Tang cultural elements

Through various channels to collect different attributes of perceptual word pairs<sup>[2]</sup>, three extractions were screened, evaluated and scored, and finally 6 groups of antonymic perceptual evaluation word pairs with higher relevance and different attributes in Tang cultural elements were identified, and each group of words was divided into five levels, with different levels representing different sensory intensity, the larger the absolute value of the score towards the two ends, also signifying stronger relevance, and the middle value was 0. The specific word pairs are as follows Table 2 shows.

**Table 2.** Tang cultural element scores for selected perceptual word pairs

Perceptual Phrases	Rating					Perceptual Phrases
Familiar	2	1	0	1	2	Strange
malleable	2	1	0	1	2	Fixed
distinctive	2	1	0	1	2	bleak
Unique	2	1	0	1	2	Usual
Personalized	2	1	0	1	2	Popular
Simple	2	1	0	1	2	elaborate

By conducting a questionnaire survey on different age groups, including 50 men and 50 women, and then ranking the scoring of 100 research subjects, it can be concluded that more than ten kinds of Tang Dynasty architectural ornaments, colors, costume elements, Tang Dynasty murals, Tang Dynasty poetry and calligraphy, Tang Emperor Xuanzong, Yang Yuhuan, ladies, generals, Tang Dynasty animal patterns, plant patterns, geometric patterns<sup>[3-7]</sup> are popular among the general public.

### 3. Research on Huaqing Palace Cultural Creative Product Design

#### 3.1. Genetic evaluation model tree building

The evaluation model tree is established as follows: first, a model tree framework with a general objective layer A, an evaluation item layer B, an assessment item layer C and an evaluation factor layer D is established. Although there are links between different categories, the sub-categories are all independent and complete. Secondly, based on the cultural genes of Huaqing Palace, the influencing factors affecting the cultural characteristics of Huaqing Palace were proposed as evaluation factors. Finally, the relationships existing among the factors at each level and across levels are analyzed, and the factors within the hierarchy are kept side by side and clearly distinguished. The evaluation model tree of the cultural genes of Huaqing Palace, which is composed according to the above criteria, is shown in Table 3 below.

**Table 3.** Huaqing Palace cultural genetic evaluation model tree

Total target layer A	Huaqing Palace Cultural Genetic Evaluation A														
Evaluation Project Layer B	Material Culture Gene B1						Intangible Cultural Genes B2								
Evaluation Project Layer C	Architectural Culture C1		Costume Culture C2		Mural Culture C3		Pattern Culture C4			Character Culture C5			Art & Culture C6		
Evaluation factor layer D	Architectural ornament D1	Architectural color D2	Costume pattern D3	Costume style D4	Mural subject D5	Mural style D6	Animal pattern D7	Plant pattern D8	Geometric pattern D9	Tang Dynasty Lady D10	Tang General D11	Yang Guifei D12	Li Longji D13	Poetry D14	Calligraphy D15

#### 3.2. Quantitative determination of model tree

After establishing the Huaqing Palace cultural genetic evaluation model tree, the subordinate or independent relationships among the influencing factors at different levels were constructed. The hierarchical analysis method<sup>[8-9]</sup> was used to compare the influence degree of each level factor and to rate the relative importance based on the same upper level factor or the same level factor, the importance rating level is usually 9-point scale, and the relative importance weight of the decision factor was calculated. Fifty users, including 20 graduate students enrolled in

industrial design and 30 visitor volunteers, were selected to make subjective ratings for each of the above layers. By calculating the weight of each evaluation item layer, it can be concluded that the weight value of immaterial culture gene B2 is greater than that of material culture gene B1, the weight value of pattern culture C4 is greater than that of other cultures, the weight value of evaluation factor D7 is the highest, followed by D8, and the weight breakdown of Tang cultural elements is shown in Table 4 below.

**Table 4.** Breakdown of the weights of Tang cultural elements

Evaluation Project Layer B	Weights	Evaluation Project Layer C	Weights	Evaluation factor layer D	Weights	Combined weights	Sort by
B1	0.333	C1	0.049311	D1	0.385891	0.019029	15
				D2	0.614109	0.030282	12
		C2	0.110127	D3	0.424472	0.046746	10
				D4	0.575528	0.063381	9
		C3	0.135927	D5	0.262516	0.035683	11
B2	0.667			D6	0.737484	0.100244	4
		C4	0.317992	D7	0.399184	0.126937	1
				D8	0.396872	0.126202	2
				D9	0.203944	0.064853	8
		C5	0.201099	D10	0.395264	0.079487	5
				D11	0.369808	0.074368	7
				D12	0.105827	0.021282	14
				D13	0.129095	0.025961	13
		C6	0.185551	D14	0.578787	0.107395	3
				D15	0.421207	0.078155	6

### 3.3. Analysis of quantitative results

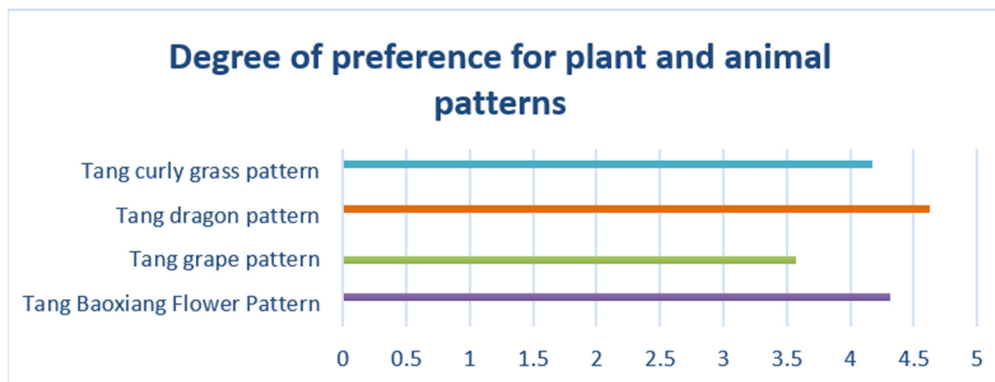
The root of product design after the quantitative assessment result,  $B1 < B2$  in stratum B, indicates that the immaterial culture gene is the basic gene of Huaqinggong culture and the superior gene for design element acquisition. Future design practice activities should take the lower factor in the immaterial culture gene as the preferred option. In the C stratum, the pattern culture gene C4 has the greatest weight, which indicates that the cultural locality of Huaqinggong is more prominent and special, and better reflects the historical and cultural connotation of Huaqinggong. Among the 15 evaluation factors finalized by stratum D, the weight of stratum D is shown in the above table 4 sorting, and the largest weight is animal pattern D7 and plant pattern D8, which indicates that pattern culture can attract more tourists and people are more impressed. They can be taken as the representative cultural genes of Huaqing Palace, and the cultural advantages of D7 should be highlighted in the process of discovering design elements, and the historical process should be perfectly combined to design more storytelling and interesting cultural and creative products.

## 4. Design application of cultural

### 4.1. Design Analysis

Huaqing Palace has many cultural elements of the Tang Dynasty and should be designed with more attractive and aesthetic elements to make consumers' desire to buy stronger. Increase the integration of culture and products through symbolic links, and feel a certain semantic

association inherent in the product visually and tactilely. According to the research in the previous article, a questionnaire on consumer's love of Tang Dynasty patterns was designed, and the most representative plant and animal patterns were selected. A 5-point Likert scale (1=strongly dislike, 5=strongly like) was used to evaluate the preference level of the classic Tang Dynasty motifs under the list of provincial cultural relics protection units within Xi'an. A total of 30 questionnaires were set up, of which 27 were valid, and the data were analyzed to obtain the mean value of each pattern preference, and the preference degree of each pattern is shown in Figure 1 below.



**Figure 1** Degree of pattern preference







According to the above data, the Tang dragon pattern, the Tang po-hsiang pattern and the Tang scrolling grass pattern, which have a high preference, were selected as the original cultural materials. The following figure shows the sample drawings of Tang dragon pattern, Tang po-hsiang flower pattern and Tang scrolling grass pattern, from which the elements were extracted and then designed by<sup>[10]</sup>.

#### 4.2. Huaqing Palace Cultural and Creative Products Display

Tang dragon pattern double dragon ring, brooch with treasure flower pattern and curly grass pattern earrings, three small pieces in total. The consumer group is positioned at the age of 18 to 35, with a personalized style, generous and elegant, while not losing fun. It can be naturally associated with the culture of Tang Dynasty in the process of use, and at the same time, we hope that the public can pay attention to and protect the traditional culture.

The integration of culture and design can improve the added value of products. And it can form the unique personality of the product by organically integrating between meeting the functional requirements of the product and stimulating the identity of the consumers. Taking the culture of Huaqing Palace as the research object, we complete the classification of cultural elements of Tang Dynasty and draw a genealogy map. Establish a genetic evaluation model of creative products based on the culture of Huaqing Palace, and finally select the Tang Dynasty cultural design factors with higher weight to carry out the design. As a carrier to inherit and promote Huaqing culture, the data generated by the creative products can also provide some help and inspiration to the design of other creative products. The before-and-after display of the development and design of Tang cultural elements is shown in Table 5 below.

**Table 5.** Before and after display of the development and design of Tang cultural elements

Tang Elements	Tang dragon pattern	Tang Baoxiang Flower Pattern	Tang curly grass pattern
Pre-development design			
Name after development and design	Double Dragon Ring with Tang Dragon Pattern	Tang Baoxiang flower brooch	Tang curly grass pattern earrings
Post-development design sample drawings			

## 5. Conclusion

The Tang Dynasty culture is not only complete and huge, but also highly developed and open, and its characteristics of being close to real life and not rigidly adhering to the ancient system make the design can be greatly applied in it. The design of Huaqingchi Culture and Creativity mainly collates, analyzes, dismantles and reconstructs the pattern elements in the Tang Dynasty culture and transforms them creatively, so as to design a series of cultural and creative products that can be accepted and favored by consumers. The products retain the original Tang Dynasty culture and unique aesthetics while having their market value.

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