Research Article

Application of Multivariate Statistical Analysis Based on the Random Matrix in the Study of Chinese Cultural Symbols

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In today’s diversified development of contemporary culture, how Chinese traditional culture and contemporary graphic design can be perfectly integrated into contemporary design and how to reflect their unique cultural symbols in contemporary design is a major issue that designers and researchers must face. This paper takes Chinese cultural symbols as the research object and adopts a multivariate statistical model based on a random matrix. By means of factor analysis and cluster analysis, the number of dimensions of multivariate data is minimized while ensuring minimal information loss to improve the efficiency of the analysis. This paper takes Chinese cultural symbols as the core and adopts a multivariate statistical method based on the random matrix for factor analysis and cluster analysis, in an attempt to establish a complete and scientific evaluation index system, which provides a reliable tool for the study of Chinese cultural symbols.

1. Introduction

Chinese elements is a symbol that can represent the characteristics and spirit of China, as well as the dignity of the nation [1]. We can see that the creation, development, and evolution of Chinese symbols are closely related to the inheritance of culture, and to a certain extent, the survival experience and change of mentality of Chinese people. There are also many kinds of Chinese elements, but in general, they can be divided into traditional Chinese spiritual culture and Chinese material culture. The fundamental difference between the two is that the former is an intangible spiritual concept [2], while the latter is a material cultural symbol. These intangible symbols of traditional Chinese culture contain traditional Chinese moral concepts, the habits of the Chinese people, traditional Chinese morality, and traditional Chinese values and ideology. Specific manifestations of traditional Chinese culture include ancient Chinese architecture, Chinese paper-cutting, and Chinese Peking Opera face painting. We can categorize Chinese traditional culture to China, but we can never see Chinese elements as Chinese tradition because Chinese elements also contain Chinese modern civilization [3].

In today’s world, the concept of “nation and world” is increasingly recognized, and China, with its long-standing cultural heritage and fast-developing market economy, is taking its place on the international stage. China’s economic, political, and cultural development has left a great impression on the world with its style and characteristics. Just as Chinese people are spread all over the world, Chinese symbols are gradually penetrating into all walks of life. Chinese elemental symbols are not only a symbol of ancient China but also an influence on the West [4–7].

1.1. Chinese Traditional Culture Occupies a Pivotal Position in Human Society. In today’s world, there are more than two thousand nationalities living together, each with the same character traits, each with their own spirituality, and each with their own unique national culture. Each country in the world has its own unique national culture, and it is these colorful national cultures that give them their distinctive national characteristics and have a profound influence on their emergence and development. The profound cultural heritage of China is a culture that every Chinese is proud of,
and it is an invincible and powerful force for the Chinese people. Since ancient times, China has been a multi-ethnic country. For thousands of years, China’s excellent culture has not only intermingled among various ethnic groups but also absorbed in its interactions with countries and peoples around the world, which makes China’s culture both pluralistic and capable of absorbing the essence of cultures around the world. This has made an important contribution to China’s national and social development, as well as to the development of countries and peoples around the world. Between traditional Chinese culture and world culture, we should not underestimate the strength of both sides and should strive to develop modern civilization while passing on the fine Chinese tradition. To achieve a perfect combination of the globalization of Chinese civilization and the Chinese characteristics of world civilization [8–10].

1.2. The Role of Chinese Independent Brand and Chinese Cultural Symbol Design in Promoting Economic Development. The symbols of Chinese elements, which nurture the spirit of Chinese culture, will become a banner for Chinese brands to go global and establish national self-confidence, while Chinese symbols will also shoulder the heavy responsibility of integrating into the world, influencing the world, and changing the world. With the continuous development of China’s economy, the world’s civilization is inseparable from China’s culture, therefore, the influence of “Chinese elements” in the international arena cannot be ignored. Chinese national companies and Chinese brands are an important part of Chinese cultural symbols, and the marketing of Chinese symbols is found all over the world. Chinese symbols are unconsciously influencing international fashion trends. At the same time, with the influence of international brands, Chinese traditional cultural symbols are being promoted more and more smoothly in the world, which is a win-win situation for both the Chinese cultural industry and the company’s development.

2. Introduction to Related Theories

2.1. Random Matrix Theory. This paper presents a new approach to study quantum systems using energy spectral statistics and reveals the influence of the properties and dynamical characteristics on their energy spectral structure. After more than half a century of development, RMT has been widely used in atomic nuclear physics, condensed matter physics, quantum chaos, and disordered mesoscopic systems, such as spectral characteristics of large atoms, energy spectrum characteristics of conducting peaks, metal-insulator transitions in disordered systems, spectral characteristics of quasiperiodic systems, chaotic systems, composite networks, timed multivariable systems (e.g., brain EEG), and stock market fluctuations [11].

RMT uses real symmetric random matrices to represent complex systems whose eigenvalues vary depending on the strength of the correlation of their eigenvalues and the variation of their eigenvalues. The volatility of the strongly correlated eigenvalues obeys the GOE statistics, while the uncorrelated eigenvalues follow the Poisson statistics [12]. All matrix element random distributions are a typical obeying GOE statistics. The nondiagonal elements in the random matrix reflect the correlation of the respective eigenvalues. A value of 0 indicates that there is no correlation between the eigenvalues, while non-zero indicates that there is a link between the eigenvalues and the volatility of the eigenvalues obeys the GOE statistics. When the diagonal cell is 0 and the diagonal cell is non-0, the fluctuations of the eigenvalues obey Poisson statistics because there is no correlation between the eigenvalues.

The eigenvalue density distribution of a solid symmetric matrix is often independent of the details of its distribution, but has eigenvalues $E_i (i = 1, 2, 3, \ldots, N)$ as a function of $N$, which denotes the dimensionality of the matrix. Thus, the eigenvalue interval distribution varies with $E_i$ and with the system characteristics. In order to find the eigenvalue fluctuation function of a real matrix with universal significance [13], RMT expands the eigenvalue spectrum and thus finds the density constant of the eigenvalues. Therefore, the eigenvalues $E_i$ are replaced by the eigenvalues $E_i$, where $E_i = \text{Nav}(E_i)$, Nav is a smooth integral of the eigenvalue density obtained using the cubic spline curve fitting method or local density averaging. Based on the eigenvalue expansion values, the nearest neighbor spacing distributions (NNSDs) function $P(s)$ of the eigenvalues is derived, which is the probability distribution of the intervals of the eigenvalue expansion values. By this method, the probability distribution of eigenvalues can be obtained from the eigenvalue NNSDs. RMT states that a randomly distributed system on a two-dimensional plane follows the GOE statistics and its eigenvalues NNSDs follow the Wigner–Dyson distribution, and a random system on a one-dimensional linear obeys the Poisson statistics and the eigenvalues of NNSDs follow the Poisson distribution.

2.2. Cluster Analysis Theory. Cluster analysis is a multivariate statistical analysis method for classifying samples or index variables. This method objectively classifies sample data or index variables according to the correlation of attribute characteristics without pre-given classification criteria, so that objects in the same class are more homogeneous than other classes and significantly heterogeneous, i.e., there are significant differences between classes and few differences within classes [14].

According to the objectives of cluster analysis, the contents of cluster analysis can be divided into Q-type cluster analysis and R-type cluster analysis, both of which are performed on variables. Q-type clustering refers to the use of the distance or correlation coefficient between samples to cluster samples with greater correlation and distinguish those with a higher degree of similarity, while R-type cluster analysis determines the correlation coefficients between individual variables by calculating their R-type cluster analysis, on the other hand, it determines the categories of variables by calculating the correlation coefficients between them, thus concentrating variables with higher similarity and separating those with greater differences. Based on the
results of R-type cluster analysis, factor analysis can be used to reduce the overall number of variables by selecting some representative ones from several different variables with large correlations, thus reducing the overall number of variables and thus achieving dimensionality reduction [15]. The difference between the two is not significant, only because the factor analysis model with dimensionality reduction thinking is more systematic and convincing than the R-type cluster analysis. Therefore, factor analysis is often used in practical research, while R-type cluster analysis is rare.

2.3. Factor Analysis Theory. Factor analysis is a data streamlining technique based on dimensionality reduction thinking, which uses the correlation coefficient matrix between measured variables to analyze their correlations and extracts a number of mutually unrelated and independent random variables from them to represent the correlations of the variables, thus extending and developing them to some extent. In simple terms, the idea of dimensionality reduction is used to combine the indicators of the original variables to make them independent and uncorrelated, so as to achieve minimum loss.

Principal component analysis and factor analysis are two methods for dealing with multivariate information, and although both can achieve simplification of data, there are major differences between them. Principal component analysis emphasizes the variation of the model on the data by simply changing the linear combination of variables to make the original variables simple and error-free and is mainly used to represent indicators without any practical value. The role of factor analysis is to explain the relationship of the original variables and focus on the correlation between them, so as to find the intrinsic correlation of the variables and the potential common factors to fit the construction of the data; however, the model contains an error that is expressed from the linear combination of the extracted common factors and a random specific factor. Therefore, factor analysis is much more practical in the application domain, sometimes even including the principal components directly.

3. Application Method Design

3.1. Model Framework Design. Culture is the blood of a nation, the source of its cohesion and creativity. With the acceleration of the global economic integration process, the globalization of culture has also spread. Symbols are the carriers of culture, while culture is the object of symbols, and the two influence each other, thus reflecting the intrinsic and extrinsic values of culture. Cultural symbols are the cultural carriers of a country; they are the symbols and literal places of existence and activity of each nation’s culture. Cultural symbols can represent the unique culture of a region, a nation, and a country.

3.1.1. Framework Overview. The model used in this application of multivariate statistical analysis based on a random matrix in the study of Chinese cultural symbols is constructed by combining cluster analysis and factor analysis with a random matrix in multivariate statistical analysis. The model diagram is shown in Figure 1 below.

3.1.2. Model Implementation Process. The process of implementing this model is to first form the feature data using factor analysis combined with the factor data generated from the random matrix, and then process and filter the data for clustering using cluster analysis. The flow chart is shown in Figure 2.

4. Indicator Program

This paper analyzes six aspects of Chinese cultural symbols: first, character symbols, mainly historical character symbols, modern character symbols, and mythological character symbols; second, object symbols, mainly object symbols, tool symbols, invention symbols, and transportation symbols; third, landscape symbols, mainly containing natural landscape symbols and human landscape symbols; fourth, concept symbols, mainly containing literature/art/sports symbols, religious belief symbols, ideological symbols, and totem symbols; fifth, folklore symbols, mainly include age and seasonal, ritual symbols, dress symbols, food symbols, and dialect symbols; sixth, other symbols, including operational definitions such as activity symbols, exhibition symbols, and organizational symbols.

4.1. Factor Analysis Design of Random Matrix Weights. In this paper, a multivariate statistical analysis of Chinese cultural symbols was conducted using the random matrix weight factor analysis method, which groups the original variables by different initial variables and expresses them as a non-measured random variable, resulting in higher correlation and lower correlation between groups, which is the basis of factor analysis. Thus, the common factor drawn from the random matrix weight factor analysis method can be expressed as a linear combination of all variables, with each factor independent of each other, thus avoiding the covariance between the original variables [16].

Factor analysis was performed according to the following procedure:

1. Factor loading array: Although there are several solution methods such as principal component method, least squares method, and great likelihood method, the difference of different starting points leads to the difference of calculation results, therefore, this paper will briefly introduce the principal component method which is commonly used in the principal component method.

First, the calculation of factor loadings: In factor analysis, factor loadings are an important bridge to establish the initial and public factors. In this model, the factor loadings \( a_{ij} \) represent the relationship between the \( i \)th variable \( X_i \) and the \( j \)th public factor \( F_j \), that is, the ratio of \( X_i \) and \( F_j \) represent the relationship between \( X_i \) and \( F_j \) [17]. Therefore, the
The correlation between the observed variables is estimated by factor loadings, and the correlation coefficients obtained from the original information and the correlation obtained from the variables derived from the factor model are generally consistent, then the model is a good fit to the observed information and the resulting factor solutions are more appropriate.

Second, the covariance of the variables is calculated: It is represented by the influence value of the contribution of the \( m \) common factors to the initial variable \( X_i \) extracted, and thus can be used to measure the validity of the factor analysis.

(2) Factor rotation: Because factor loading reflects the correlation between the extracted common factor and the variables, it is difficult to interpret the names of the common factors that if each variable has the same magnitude of loading on a particular common factor. For this reason, factor rotation is used according to the non-uniqueness obtained when calculating factor loading, so that the structure of the rotated factor loading array is simplified and the interpretation of the common factors is more reasonable. Turning the squared values of the factor loadings \( a_{ij} \) in the loading array in the direction of 0 in favor of 1, either by making the corresponding axes of the factors turn to each other perpendicularly or by performing oblique rotation, eventually leading to larger values of the loadings, with lower loadings less treated as factor rotation [18]. What changes before the rotation is the factor loadings, while what remains the same is the commonality of the variables, i.e., the contribution of the common factor to \( X_i \), so that after the rotation, a common factor with practical explanatory meaning can be obtained.

(3) Factor scores: After the factor analysis model is established, in order to examine the characteristics and correlations of each sample, the scores of each sample can be obtained by calculating the common factor of each sample to derive the variability among the samples.

The algorithmic procedure for random matrix weighted detection is as follows.

In this paper, a random matrix-based approach is proposed to make the study of Chinese cultural symbols more representative. In this paper, the GSV of the singular value detection algorithm of Gaussian random matrix is factorized and identified.

The specific implementation process of the GSV algorithm is as follows:
4.2. Symbolic Clustering Analysis Design. The clustering algorithm proposed in this paper uses K-means clustering, which is also called dynamic clustering. Although both types of clustering are based on the distance, the difference between them is that systematic clustering can generate different classification results according to certain classes, while dynamic clustering can only cluster according to certain classes [19–21]. Therefore, when there are many sample points and the clustering operation is slow, using systematic clustering is a troublesome task, but at this time, dynamic clustering becomes more convenient and practical.

The basic idea of dynamic clustering method is as follows: first, a number of samples are randomly selected from a large number of samples as the initial aggregation points, then the distance between the remaining samples and the aggregation points is calculated to arrive at the smallest set point, then the samples are clustered in a class, then the center of each class is calculated, and then the next clustering is performed, and so on, until the new clustering result is exactly the same as the last one, or the news.

5. Application of Experimental Analysis

5.1. Data Preparation. This paper takes Chinese cultural symbols as the research object and selects representative newspapers as samples. People’s Daily is the most authoritative and authoritative Chinese newspaper in China and the central organ of the Communist Party of China; Beijing Weekly is the first domestic current affairs magazine since the founding of the new China and an important foreign propaganda publication of the central organ, selling well in North America, Europe, and Southeast Asia in more than 100 countries and regions; China Today is the comprehensive monthly news magazine with the most languages in China at present, with 10 print editions. According to the information of China Foreign Language Press, the foreign language versions are available in English, French, German, Russian, and Japanese.

These four foreign newspapers can not only provide readers with authoritative explanations of cross-strait issues, Chinese issues, and international issues, especially international issues involving China, but also have a wide distribution and considerable influence abroad. The article analyzes the English monthly magazines such as People’s Daily, Overseas Edition, Beijing Weekly, China Today, and China Pictorial [22].

Compared with words, the visual stimulation of images is more attention-grabbing, and the information it can convey is no less than that of words, especially in the age of images, its intuitiveness and interest make it occupy a pivotal position in information exchange and communication. For this reason, this paper chooses the photo of the front page of People’s Daily, and the English cover photos of China Today, Beijing Weekly, and China Pictorial.

5.2. Reliability Test. Reliability refers to the stability or reliability of test results, which usually reflects that a test can be repeated to obtain the same results under the same conditions, that is, the consistency between the measured values obtained twice when a test is applied to the same group of objects. The higher the consistency and stability of the measurements, the higher the reliability, and conversely, the lower the reliability.

To verify the reliability of this research scheme, this paper uses Holsti’s reciprocity formula to monitor the coders’ interaction reliability with $K = 2M/(N_1 + N_2)$ as the criterion.

First, a partial sample of People’s Daily from January 1, 2019, to April 30, 2021, was selected as the reliability monitoring sample (about 10%) in this paper. Second, the coders were trained on the definition and classification of Chinese cultural symbols, the understanding of coding procedures, and the filling out of forms to discover differences and unify their understanding in a timely manner and to become familiar with the coding procedures after training and practice. On this basis, the coders coded the sampled Chinese cultural symbols, the classification of Chinese cultural symbols, and the selection of Chinese cultural symbols by foreign newspapers in terms of their periodicity and regionality.

It was found that the reliability factor of Chinese cultural symbols in the sample images was 0.99; the classification of Chinese cultural symbols had a reliability factor of 0.97; and the periodicity and regional selectivity of newspapers on Chinese cultural symbols were both higher than 0.99. The reliability of all the above indicators is above 0.9, and in general, the credibility of this research proposal is good.

5.3. Application of Random Matrix Weight Factor Analysis

5.3.1. Normalizing the Processing of Raw Data and the Calculation of the Correlation Coefficient Matrix. Since the units of measurement of each index in the raw data are different, direct analysis of them affects the determination of the results. The correlation coefficient matrix was derived from this information through the standardized information in SPSS to determine the degree of correlation between the variables, and the correlation coefficient matrix was discretized (see Figure 3).
They have advantages in other areas and that the future development of Chinese cultural symbols will be more urgent. Other symbols, on the other hand, are the opposite; they are superior in intuition and deficient in other aspects.

5.4. Application of Symbolic Clustering Analysis. Using the above factor analysis, the 1028 symbols could be clustered using the K-means method using the five main factors as variables. In this study, the sample was divided into five categories according to the results of the factor analysis, as shown in Table 4.

By analyzing the number of cases in each group, 1028 Chinese cultural symbols were obtained, and a total of 3162 were generated. Among them, 325 characters, accounting for 31.99% of the total; 1604 characters, accounting for 50.73%; 125 symbols in total, accounting for 12.30%, occurred 460 times with a frequency of 14.55%; 271 landscape symbols, accounting for 26.67% of the Chinese cultural symbols, occurred 393 times with a frequency of 12.43%; 107 conceptual symbols, accounting for 10.53%, occurred 399
### Table 1: Total variance values of the original variables explained by the factors.

<table>
<thead>
<tr>
<th>Factor number</th>
<th>Eigenvalue</th>
<th>Variance contribution rate</th>
<th>Cumulative variance contribution</th>
<th>Initial solution</th>
<th>Eigenvalue</th>
<th>Variance contribution rate</th>
<th>Cumulative variance contribution</th>
<th>Initial factor solution</th>
<th>Eigenvalue</th>
<th>Variance contribution rate</th>
<th>Cumulative variance contribution</th>
<th>Final factor solution</th>
<th>Cumulative variance contribution rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.94</td>
<td>49.49</td>
<td>49.49</td>
<td>1.20</td>
<td>1.20</td>
<td>9.97</td>
<td>9.97</td>
<td>1.05</td>
<td>1.05</td>
<td>8.76</td>
<td>8.76</td>
<td>0.90</td>
<td>7.49</td>
</tr>
</tbody>
</table>

### Table 2: Factor score coefficient matrix.

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z score (X1)</td>
<td>−0.113</td>
<td>0.112</td>
<td>−0.193</td>
<td>0.489</td>
<td>0.062</td>
</tr>
<tr>
<td>Z score (X2)</td>
<td>−0.028</td>
<td>−0.195</td>
<td>−0.015</td>
<td>0.653</td>
<td>−0.109</td>
</tr>
<tr>
<td>Z score (X3)</td>
<td>0.372</td>
<td>0.085</td>
<td>−0.407</td>
<td>−0.245</td>
<td>0.407</td>
</tr>
<tr>
<td>Z score (X4)</td>
<td>0.688</td>
<td>−0.315</td>
<td>−0.105</td>
<td>0.016</td>
<td>−0.106</td>
</tr>
<tr>
<td>Z score (X5)</td>
<td>0.188</td>
<td>0.227</td>
<td>0.056</td>
<td>0.078</td>
<td>−0.260</td>
</tr>
<tr>
<td>Z score (X6)</td>
<td>0.090</td>
<td>0.200</td>
<td>0.089</td>
<td>−0.042</td>
<td>−0.055</td>
</tr>
<tr>
<td>Z score (X7)</td>
<td>−0.260</td>
<td>0.715</td>
<td>−0.148</td>
<td>−0.078</td>
<td>−0.006</td>
</tr>
<tr>
<td>Z score (X8)</td>
<td>0.113</td>
<td>0.131</td>
<td>0.408</td>
<td>−0.036</td>
<td>−0.355</td>
</tr>
<tr>
<td>Z score (X9)</td>
<td>−0.049</td>
<td>0.059</td>
<td>0.348</td>
<td>0.026</td>
<td>−0.096</td>
</tr>
<tr>
<td>Z score (X10)</td>
<td>−0.194</td>
<td>−0.208</td>
<td>0.702</td>
<td>−0.112</td>
<td>−0.013</td>
</tr>
<tr>
<td>Z score (X11)</td>
<td>−0.263</td>
<td>−0.077</td>
<td>0.019</td>
<td>0.013</td>
<td>0.614</td>
</tr>
<tr>
<td>Z score (X12)</td>
<td>0.062</td>
<td>−0.136</td>
<td>−0.163</td>
<td>−0.022</td>
<td>0.563</td>
</tr>
</tbody>
</table>

### Table 3: Factor scores, composite scores.

<table>
<thead>
<tr>
<th>Data set number</th>
<th>FAC1-1</th>
<th>FAC2-1</th>
<th>FAC3-1</th>
<th>FAC4-1</th>
<th>FAC5-1</th>
<th>F</th>
<th>Overall ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.45</td>
<td>0.86</td>
<td>1.23</td>
<td>1.45</td>
<td>0.85</td>
<td>0.77</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>−1.95</td>
<td>−0.63</td>
<td>−0.33</td>
<td>−0.18</td>
<td>0.33</td>
<td>−0.49</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>−0.54</td>
<td>−0.72</td>
<td>−0.6</td>
<td>−0.23</td>
<td>1.26</td>
<td>−0.16</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>0.4</td>
<td>−1.39</td>
<td>−0.87</td>
<td>1.54</td>
<td>−0.03</td>
<td>−0.08</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>0.78</td>
<td>−0.5</td>
<td>−0.24</td>
<td>−0.05</td>
<td>1.98</td>
<td>0.31</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>−1.1</td>
<td>0.4</td>
<td>−0.64</td>
<td>−1.59</td>
<td>−1.13</td>
<td>−0.65</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>−2.14</td>
<td>0.02</td>
<td>2.02</td>
<td>1.73</td>
<td>1.02</td>
<td>0.37</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>0.71</td>
<td>−0.8</td>
<td>−0.26</td>
<td>−0.55</td>
<td>0.73</td>
<td>−0.02</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>0.12</td>
<td>−1.1</td>
<td>0.27</td>
<td>1.6</td>
<td>−0.91</td>
<td>−0.01</td>
<td>4</td>
</tr>
</tbody>
</table>

### Table 4: Clustering results.

<table>
<thead>
<tr>
<th>Types of Chinese cultural symbols</th>
<th>Number</th>
<th>Number of cases as a percentage (%)</th>
<th>Frequency</th>
<th>Frequency share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clustering 1-character symbols</td>
<td>325</td>
<td>31.99</td>
<td>1604</td>
<td>50.73</td>
</tr>
<tr>
<td>Cluster 2-object symbols</td>
<td>125</td>
<td>12.30</td>
<td>460</td>
<td>14.55</td>
</tr>
<tr>
<td>Cluster 3-landscape symbols</td>
<td>271</td>
<td>26.67</td>
<td>393</td>
<td>12.43</td>
</tr>
<tr>
<td>Cluster 4-conceptual symbols</td>
<td>107</td>
<td>10.53</td>
<td>399</td>
<td>12.62</td>
</tr>
<tr>
<td>Cluster 5-folklore symbols</td>
<td>61</td>
<td>6.00</td>
<td>144</td>
<td>4.55</td>
</tr>
<tr>
<td>Other symbols</td>
<td>127</td>
<td>12.50</td>
<td>162</td>
<td>5.12</td>
</tr>
<tr>
<td>Total</td>
<td>1016</td>
<td>100</td>
<td>3162</td>
<td>100</td>
</tr>
</tbody>
</table>
times with a frequency of 12.62%; 73 folk symbols, accounting for 6.00% of the total symbols, occurred 144 times with a frequency of 4.55%; 127 other symbols, accounting for 12.50%, occurred 162 times with a frequency of 5.12%.

6. Conclusion

Cultural symbols are abstract cultural signs. Cultural symbols can not only strengthen national consensus and cultural identity but also achieve cross-cultural communication and soft power effect through the representation of a national or personal image. The article scrutinizes the experimental data on Chinese cultural symbols. On the basis of the data, the performance status and characteristics of Chinese cultural symbols are analyzed, and the reasons for their performance and possible influencing factors are briefly discussed. Through the study of Chinese cultural symbols, this study finds that the messages shown in these experimental data are characterized by multiple types and categories, and the K-means method is used to classify them into five major categories, with corresponding explanations for the different types.

Data Availability

The dataset used in this paper are available from the corresponding author upon request.

Conflicts of Interest

The author declares that they have no conflicts of interest regarding this work.

References