Visualization Research of Sichuan Liquor Brand Personality Traits Based On Big Data Analysis

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Abstract. This paper applies the research results of visual analysis to the field of brand personality research. Taking seven e-commerce platform products representing Sichuan liquor as the research object, the combination of social network analysis and co-word analysis is used to quantify high-frequency characteristics, revealing Sichuan liquor brand personality shaping propositions, and helping enterprises further differentiate their brand personality.

Keywords: Big Data, Sichuan Liquor Brand, Brand Personality, Social Network Analysis, Co-Word Analysis.

1. Introduction
Brand personality has always been a hot topic in the field of marketing theory and practice. Enterprises convey a specific brand image through brand strategy and advertising information to show brand personality. Consumers will make their own subjective evaluation of this information, and then form the brand personality in their minds [1]. Brand personality can create emotional value for consumers, enhance purchase desire, and bring customer loyalty to the enterprise.

With the intensification of product homogeneity, the shaping of brand personality can make Sichuan liquor companies unique and different. It is of great significance for brand construction of Sichuan liquor companies to shape the personification of brands and realize brand differentiation. With the help of co-word analysis, social network analysis, this paper focuses on the e-commerce platforms of representative Sichuan liquor companies to capture personalized words of products, explore brand personality propositions, and provide reference for shaping the brand personality of Sichuan liquor.

2. Brand Personality
Aaker believes that brand personality is a collection of personality traits related to the brand, and puts forward brand personality dimensions, which mainly include five dimensions: sincerity, exciting, competence, sophistication, and ruggedness [2] and has been widely recognized and applied in western academic circles. In China, scholars mainly research brand personality based on Chinese localization [3-5]. The personality dimensions of localized brands, such as benevolence, wisdom, bravery, exciting and elegance, proposed by Huang Shengbing are widely used [6]. Based on the related brand personality dimensions, this paper will analyze the brand personality propositions of
Sichuan liquor companies on the e-commerce platform, and put forward suggestions to shape the unique Sichuan liquor brand personality.

3. Research Methods

Social network analysis (SNA) is a research method that reflects the social relationship between nodes by building the interaction model between them [7]. It has become a multidisciplinary approach with applications in sociology, the information sciences, psychological and other fields [8]. Based on the social network analysis method, this paper uses ucinet6.0 to visualize the high-frequency characteristic words of brand personality.

Co-word analysis is a kind of content analysis. The main principle is to count the number of times that a group of words appears in the same document, and to cluster these words, so as to reflect the relationship between these words [9]. In this paper, the co-word analysis method is used to quantify Sichuan liquor brand personality words, and accurately identify the brand personality.

4. Research Design

4.1. Data Source

Based on the “2019 China’s 500 Most Valuable Brands List” published by the World Brand Lab, this paper selects seven Sichuan liquor brands on the list as the research objects, which are WULIANGYE, Lang, LUZHOU LAOJIAO, SHEDE, JNC, TUO PAI and SHUIJINGFANG.

In order to ensure the authenticity and objectivity of the research data, this paper selects a total of 275 products of seven Sichuan liquor brands as valid samples based on the official flagship store of the e-commerce platform, and extracts words reflecting the personality of the product brand in the details page as analysis data. Referring to the brand personality dimension developed by Aaker and Shengbing Huang, this paper will replace the extracted descriptive words with brand personality trait words.

4.2. Extract High-Frequency Trait Words

This paper introduces the word frequency statistics of SATI3.2. After descending, the paper finds 234 character words, combined words with similar meanings, and finally gets 204 words. There are 78 characteristic words with a frequency of 1. According to Donohue proposed formula for dividing critical values between high-frequency words and low-frequency words [10], this paper calculates that the threshold of high frequency words is 12, that is, the first 39 trait words with frequency greater than or equal to 12 are high frequency words, as shown in Table 1.

| Serial number | Characteristic words | Frequency |
|---------------|----------------------|-----------|
| 1             | Mild                 | 140       |
| 2             | Mature               | 108       |
| ...           | ...                  | ...       |
| 38            | Healthy              | 12        |
| 39            | Decent               | 12        |

4.3. Construct Dissimilarity Matrix

This paper uses SATI 3.2 to count the number of different trait words appearing in the same product description, generating a co-word symmetry matrix of 39*39. To eliminate the influence of frequency disparity on the statistical results in the co-word matrix, the equivalence coefficient is used to transform the co-word matrix into a similar matrix, and the sum of the matrix elements with -1 is used as the values of the different matrix elements to generate the dissimilarity matrix, as shown in Table 2.

| Mild | Mature | ... | Straightforward | Sweet | Persistent |
|------|--------|-----|-----------------|-------|------------|
|      |        |     |                 |       |            |
5. Results and Discussion

5.1. Social Network Map Analysis
In order to accurately describe the relationship between high-frequency trait words, this paper introduces the trait word co-word matrix into Ucinet6.0, as well as uses NetDraw software for visual processing to obtain a high-frequency trait word social network map, as shown in Figure 1.

![Figure 1. Social network map of high-frequency trait words](image)

In the social network map, dots represent high-frequency trait word nodes. The larger the nodes are, the greater the role they play in the whole feature word network, and the stronger the ability to control other nodes. The solid line represents the relationship between nodes. The thicker the line, the more times the two features appear together.

From the analysis of node size, “mature”, “mild”, and “ancient” close to the center of the network map and have larger dots, which form the core of Sichuan liquor brand personality and are the focus of brand personality shaping; words include “warm”, “decent”, “exemplary”, which are located on the edge of the graph and have smaller dots, and they are relatively distant from other nodes. Therefore, these characteristics do not fully represent the brand personality.

From the analysis of the thickness of the solid line, with “mild” as the center, the thickest and closest connection with “sweet”, “honourable”, “mature”, and “straightforward” indicates the highest frequency and strongest connection. The combination is universal and representative for describing the personality of Sichuan liquor brand.

5.2. Point Centrality Analysis
This paper uses Ucinet6.0 to calculate the centrality of Sichuan liquor brand personality vocabulary through the Network-Centrality-Degree path, as shown in Table 3.

| Serial number | Characteristic words | Degree | NrmDegree |
|---------------|----------------------|--------|-----------|
| 1             | Mild                 | 579.000| 23.086    |

Table 3. Analysis results of Sichuan liquor brand personality degree centrality liquor (part)
### Table 4. Sichuan liquor representative brand personality classification table

| Category          | Characteristic words                                                            |
|-------------------|----------------------------------------------------------------------------------|
| Harmony           | Mild, Sweet, Harmonious, Mature, Pure                                             |
| Morality          | Straightforward, Elegant, Kind, Delicate, Persistent, Distinctive, Exemplary,   |
|                   | Rustic                                                                          |
| Wisdom            | Literate, Wise, Stylish, Artistic, Reliable, Warm                                 |
| Ancient           | Secluded, Quaint, Ingenious, Connotative, Ancient, Inherited, Conventional,      |
|                   | Classical                                                                       |
| Elegance          | Honourable, Imposing, Noble, High-quality, Solemn, Decent                        |
| Unsophistic       | Auspicious, Gentle, Healthy, Integrity, Ecological, Natural                     |

The first category includes five brand personality trait words. These words generally used to describe the taste of alcohol and liquor products and mellow taste, therefore the first category is named “harmony”.

The second category includes eight brand personality words. This type of words is used for describe people’s good conduct and noble morality, which reflects the role of Sichuan liquor companies in the industry. The leadership role can be named “morality”.

The third category includes six brand personality words. These can be used to describe people’s internal temperament and external image formed in the learning and practice of the day after tomorrow, reflecting the rich wisdom of Sichuan liquor brand and the characteristics of the brand representative group, which is named “wisdom” in this study.

The fourth category is composed of eight brand personality words. It reflects the production tradition and development history of Sichuan liquor companies, and shows that Sichuan liquor brands have deep heritage, so it is named the word “ancient” in ancient Chinese.

The fifth category includes six brand personality words. These words can be used to describe elegant style and noble status, reflecting the elegant and well-known Sichuan liquor brand, so this class is named “elegance”.

The sixth category includes six brand personality words. They are used to describe the unworldly and undecorated nature of Sichuan liquor brand, so the paper uses “unsophisticated” to name this class.

### 6. Research Conclusions and Suggestions

The research conclusions of this paper are as follows. First, the vocabulary of Sichuan liquor brand can be divided into six categories: “harmony”, “morality”, “wisdom”, “ancient”, “unsophisticated” and “elegance”. Which reflecting the connotation and characteristics of Sichuan liquor products in color, aroma, taste, production raw materials, production technology and packaging. Secondly, the focus of Sichuan liquor brand personality proposition are two categories: “harmony” and “elegance”, which include imposing, honourable, ancient, conventional, quaint, pure, harmonious, mild, sweet and so on. These focus on product quality, brand social characteristics and historical culture.
Based on the above conclusions, this article puts forward two suggestions for the personality construction of Sichuan liquor brand. First of all, the existing e-commerce platform products can better express Sichuan liquor brand personality proposition. Enterprises should pay attention to the key characteristics of brand personality propositions, create differentiated product personality, express unique brand personality, and realize the differentiation of Sichuan liquor brand. Secondly, the enterprises should deeply dig into the brand personality from the perspective of consumers, so as to help consumers refine and summarize brand characteristics, guide consumers to form brand personality expectations, and build brand loyalty.

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