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Study on the Public Perception Characteristics of Intangible Cultural Heritage in China from the Perspective of Social Media

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Abstract

Exploring public awareness, participation, and emotional inclination toward intangible cultural heritage (ICH) clarifies public attitudes and demands toward traditional culture, providing a crucial basis for targeted ICH protection and inheritance. Based on ICH text big data collected from China's mainstream social media platform Weibo, this study improves the TF-IDF algorithm, integrates LDA topic analysis for semantic feature mining, and trains a new sentiment analysis model to explore public emotional attitudes and their formation mechanisms. The study is geographically limited to China and covers the entire year of 2023. The results show that: (1) Public ICH perception is multi-dimensional, with close attention to crafts like paper-cutting and traditional Chinese medicine; action-oriented terms reflect dynamic inheritance demands. Public discussions focus on three dimensions: ICH inheritance and development (39%), introduction and promotion (45%), and public experience and participation (16%), with the latter accounting for a low proportion. (2) Public sentiment toward ICH is predominantly positive, with all regions scoring above 0.730 (full score = 1), and Zhejiang (0.751) and Jiangsu (0.750) ranking significantly higher. (3) Spatial econometric analysis reveals marked regional differences in ICH sentiment distribution, mainly affected by three key factors—the number of ICH projects, the number of inheritors, and regional GDP—with regression coefficients of 0.699, 0.632, and 0.458 ($p < 0.01$). This finding provides a basis for formulating targeted ICH protection strategies.

Keywords: intangible cultural heritage (ICH); social media; public perception; theme mining; GIS

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1. Introduction

As a key element of humanity's traditional heritage and collective wisdom, intangible cultural heritage (ICH) holds profound value in sustaining historical traditions, national identity, and cultural cohesion [1]. The Opinions on Further Strengthening the Protection of Intangible Cultural Heritage, released in August 2021 by the General Offices of the CPC Central Committee and the State Council, highlighted the critical role of ICH as both a living legacy of China's uninterrupted civilization and a key pillar for sustaining national cohesion. It outlined the necessity of safeguarding, transmitting, and leveraging this heritage effectively [2]. The sustainability of ICH fundamentally relies on public awareness, active participation, and emotional investment, which collectively shape social recognition, inheritance intention, and the vitality of long-term transmission.

Currently, research on intangible cultural heritage (ICH) in China falls into two main categories. The first category consists of basic and applied research on ICH grounded

in folklore, sociology, and tourism studies. This type of research draws on theories and methodologies from folklore, sociology, and tourism studies as its core foundation, focusing on the fundamental theories and practical applications of ICH. Its core research content encompasses three major dimensions. In the conceptual and theoretical dimension, scholars focus on fundamental issues such as the definition of ICH, classification criteria, and the construction of a disciplinary framework [3–5]. They provide localized interpretations of the ICH concept within the context of China's indigenous culture and explore the disciplinary positioning and research framework of ICH studies [6]; In the dimension of characteristics and value research, methods such as ethnographic surveys and case studies are employed to explore the cultural characteristics, spiritual value, historical value, and contemporary value of ICH, emphasizing its central role in maintaining cultural diversity and fostering national identity [7]; in the dimension of transmission and preservation research, the focus is on analyzing the survival challenges faced by ICH bearers and the issue of intergenerational transmission gaps, while exploring pathways for its preservation [8]. From a tourism studies perspective, related research also focuses on models of integration between ICH and the tourism industry, proposing sustainable development strategies for ICH tourism [9–11]. Such studies primarily rely on qualitative analysis or small-scale surveys, emphasizing theoretical interpretation and empirical summarization. While they can deeply analyze the internal logic of ICH transmission, they struggle to systematically depict the authentic attitudes of the public on a large scale, across entire regions, and in a dynamic context.

The second category comprises studies on the spatiotemporal characteristics of ICH based on geography. These studies rely on geographical theories and methods, such as spatial analysis and spatiotemporal modeling, to examine the patterns of spatiotemporal distribution, evolutionary characteristics, and influencing factors of ICH projects [12,13]. In the spatial dimension, scholars frequently employ GIS methods such as kernel density analysis, spatial autocorrelation, and hotspot analysis to visualize and quantitatively analyze the spatial distribution patterns of national and provincial-level ICH projects, exploring the influence of factors such as natural geographical environment, population distribution, economic levels, transportation conditions, and historical and cultural spheres on the spatial patterns of ICH [14]. In the temporal dimension, research focuses on the historical evolution of ICH, integrating contexts such as dynastic changes, social transformations, and shifts in cultural policies to trace the spatio-temporal diffusion pathways, structural transformation characteristics, and driving mechanisms of ICH, and to analyze the driving mechanisms and transmission trajectories of its spatio-temporal evolution [15]. While such research clearly reveals the patterns of physical spatial differentiation in ICH, its analysis primarily relies on official statistical data regarding ICH sites. Essentially, it depicts the objective spatial distribution of ICH, making it difficult to capture the public's subjective emotional responses, cognitive focus, and attitudinal preferences.

At the international level, research on the protection of intangible cultural heritage, as a global issue, began earlier abroad. After long-term development, it has formed a relatively mature protection system and research paradigm, with overall research conducted across multiple dimensions and yielding abundant results. Overseas ICH research is characterized by multidisciplinary integration and primarily focuses on the following research directions: First, the definition and theoretical refinement of the concept of ICH, where scholars clarify the definition, scope, and essence of ICH from different perspectives [16,17]; second, the reflection on and research into strategies for ICH preservation, which involves critical analysis and discussion of implementation barriers and shortcomings in conventions, along with the proposal of targeted solutions [18–20]; and third, research on the digital preservation of ICH. As laws and regulations related to ICH in various countries have been refined, digital preservation has become a key research focus, with scholars actively exploring the

application of various technologies in ICH preservation [21,22]. In recent years, the use of social media data to analyze intangible cultural heritage has attracted significant attention, offering new insights into how people interact with and perceive heritage sites [23]. For example, various social media platforms such as Twitter, Foursquare and Instagram have demonstrated their value in capturing the public's interactions with and emotional expressions regarding cultural heritage [24,25]. These platforms emphasize the connection between heritage and collective memory and can enhance a sense of community identity and belonging through the sharing of experiences [26]. Although the international research landscape is diverse, it remains primarily focused on macro-level policies, conservation models, and technological applications, with relatively limited exploration of micro-level individual perceptions and large-scale public attitudes.

Overall, domestic and international ICH research has established a multidisciplinary research framework, providing important theoretical and practical support for the protection and transmission of ICH. However, existing research largely focuses on ICH itself and the macro-level, traditional theories and qualitative studies emphasize conceptual analysis, while geospatial analysis concentrates on physical distribution. Both types of research struggle to capture the public's emotional responses and subjective perceptions, lacking attention to the public's perspective, and are particularly weak in "demand-side" research such as public perception and emotional feedback. This not only prevents an accurate understanding of public needs and constrains the living transmission of ICH but also renders the ICH research system incomplete. Based on this, this study takes "public perception" as its entry point. Relying on text data from social media platforms and combining methods such as text mining and sentiment analysis, it systematically explores the characteristics and regional variations in public perception regarding ICH, thereby providing more targeted practical guidance for the protection and dissemination of ICH.

With the rapid development of the internet, social media has become a vital platform for people to access information, express opinions, and share their lives. Characterized by rapid information dissemination, strong interactivity, and broad reach, social media has broken through the temporal and spatial limitations of traditional communication methods, enabling ICH to reach audiences across different regions, age groups, and cultural backgrounds more efficiently. In recent years, an increasing amount of ICH has been showcased and disseminated through social media platforms such as Weibo. Public awareness and interest in ICH have continued to rise. Netizens use social media to express their views, opinions, and emotions regarding these events, generating a vast amount of public sentiment data. This provides a new avenue for researching the public's perception of ICH. Against this backdrop and utilizing such data, this paper employs web crawling technology to collect Weibo posts and comments related to ICH. By refining the traditional TF-IDF algorithm and integrating it with the LDA topic analysis method, we construct a convergent analytical framework to deeply mine keywords and thematic information from ICH-related texts. Additionally, we train and generate an optimized sentiment analysis model using a corpus specific to the ICH field to accurately capture the public's genuine emotional attitudes toward ICH. This study aims to gain a deeper understanding of the public's level of awareness, areas of focus, and emotional attitudes toward ICH, in order to more accurately identify public needs and expectations regarding ICH. This will facilitate the formulation of more effective protection and transmission strategies and provide a scientific basis for the development of the ICH cultural industry.

2. Data Collection and Preprocessing

2.1. Intangible Cultural Heritage Data

The China Intangible Cultural Heritage Network has published five batches of the National List of Intangible Cultural Heritage Representative Projects. This study scraped ICH data (including both the official and expanded lists), identified a total of 3610 ICH items, and obtained the geographic coordinates of the protection units for these items from Baidu Maps as point-based foundational data. Through address resolution and spatial matching, precise latitude and longitude coordinates corresponding to each ICH item were derived, thereby completing the conversion of ICH items from textual information to spatial point features. This process generated point-based vector data suitable for spatial analysis. Using the 1:4 million national vector map from the National Basic Geographic Information System database as the base map, a spatial distribution map of national-level intangible cultural heritage was created (as shown in Figure 1). This map visually illustrates the clustering patterns and regional variations in ICH resources across the country. Additionally, an ICH database was established to provide a data foundation for subsequent research on the spatial distribution characteristics, regional differences, and public perception of ICH on social media.

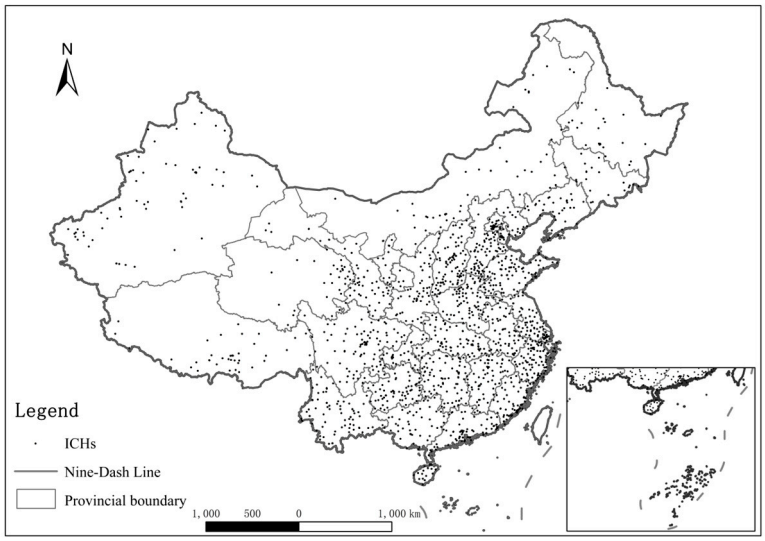


Figure 1. Spatial distribution of intangible cultural heritage at the national level.

2.2. Microblog Data

This study selects Weibo data as its primary data source. Given its relevance to research on public perceptions of intangible cultural heritage, as well as its social representativeness and ease of access, Weibo data can comprehensively reflect the public's genuine emotions, cognitive attitudes, and areas of focus regarding intangible cultural heritage. It provides reliable support for the quantitative analysis of public perceptions of intangible cultural heritage and is suitable for conducting large-scale, systematic empirical research. To focus on the public's overall perception of intangible cultural heritage, this study uses "intangible cultural heritage" as the keyword and employs web crawling technology to collect Weibo data from 1 January 2023 to 31 December 2023. When using crawlers to collect data, the platform's anti-crawling mechanisms often result in duplicate data being captured; therefore, duplicate information was first filtered from the text. This study first used the deduplication function in programming tools to automatically filter out duplicate texts, followed by manual verification of the deduplicated results to ensure data uniqueness. Secondly, the original online texts contained a significant amount of "invalid information," which could interfere with subsequent text analysis and sentiment mining. Therefore,

this study targeted false information and promotional content by combining keyword matching with manual review to screen out and delete texts containing obvious advertising indicators such as "reseller," "snatch purchase," "links," and "50% off." Additionally, for text containing excessive emoticons or formatting errors, regular expression matching was used for identification and filtering. This process cleansed the data, improved its overall quality, and further enhanced its usability and reliability. Furthermore, a custom dictionary and stopword list for intangible cultural heritage topics were established, and the Chinese word segmentation plugin Jieba was used for automatic segmentation. After data preprocessing, a total of 76,591 Weibo posts and 57,448 comments were retained. Each Weibo post and comment contains information such as user ID, username, posting time, location, and content, as shown in Table 1.

Table 1. Example of Microblog Comment Data.

ID	Time	Region	Comment
1503947531	2 January 2023 23:40:00	Bejing	It looks really good, this place is so great, I would love to go and feel it too.
5666429237	12 December 2023 9:09	Fujian Province	How can there be a better way to present it by moving to such a stage and establishing such an intangible cultural heritage museum!
1686308822	1 August 2023 14:21:00	Zhejiang Province	It's so interesting and worthy of being a national intangible cultural heritage.
6077660293	20 January 2023 1:15:00	Guangdong Province	I will go here to hit the card when I have a chance.

3. Methods

3.1. Text Mining Methods

3.1.1. ICH Keyword Extraction Based on an Improved TF-IDF Algorithm

The TF-IDF algorithm, proposed by Salton [27], is a commonly used weighting technique in text mining and information retrieval, primarily employed for text classification and keyword extraction. The term frequency (tf) represents the frequency with which a term appears in a document; the inverse document frequency (idf) reflects the importance of that term within the document dataset [28]. The traditional TF-IDF algorithm considers only the frequency distribution of features, without distinguishing between part-of-speech differences and domain-specific attributes. It is particularly ill-suited for texts on intangible cultural heritage (ICH), which are dense with cultural proper nouns and exhibit strong domain-specific characteristics. This approach tends to downplay the importance of core ICH vocabulary, making it unsuitable for the precise selection of keywords in the ICH domain. To gain a clearer understanding of the public's focus and discussion topics regarding intangible cultural heritage, this paper proposes a weighted TF-IDF method based on part-of-speech classification for keyword extraction from texts in the intangible cultural heritage domain. By categorizing words into four major types—verbs, nouns, adjectives, and ICH-specific terms—and assigning different weights to each category based on TF-IDF, this method assigns the highest weight to ICH-specific terms to highlight their core identifying role in ICH texts; key verbs are assigned the next highest weight to reinforce the expression of core issues such as the transmission and development of ICH and practical actions; common nouns, adjectives, and common verbs are assigned corresponding weights in order of their semantic importance. This approach addresses the limitation of the traditional TF-IDF algorithm—which "measures word importance solely by frequency"—thereby improving the accuracy and semantic relevance of keyword extraction. It provides more reliable

textual feature support for subsequent research, such as LDA topic modeling and sentiment analysis. The specific definitions are as follows:

$$t_{ij} = tf_{ij} \times \log\left(\frac{N}{n_j + 0.1}\right) \times w_{ij}$$

where tf_{ij} denotes the word frequency of word or phrase j in text i, N denotes the total number of texts in the dataset, n_j denotes the total number of texts in the text dataset that contain word j (plus 0.1 to avoid the occurrence of 0 in the denominator), w_{ij} denotes the lexical weight of the word or phrase j, and t_{ij} denotes the weight of the word or phrase j in text i.

3.1.2. Theme Mining

The Latent Dirichlet Distribution Model (LDA model) is a probabilistic topic model that can extract latent topic information from massive textual data, thus revealing the latent topic structure in a large-scale document set or corpus [29]. The basic idea is to represent a document as a mixture of multiple potential topics and represent each topic as a probability distribution of words [30]. LDA topic model uses an unsupervised learning method to mine text information, which is suitable for dealing with large-scale unstructured text data generated by social media.

3.1.3. Sentiment Analysis

SnowNLP is a Bayesian-modeled Chinese NLP tool that performs sentiment analysis through specialized Chinese text processing functions [31]. It uses a sentiment dictionary analysis method to count the number of positive and negative sentiment words appearing in the text to determine the overall sentiment tendency, which is especially suitable for dealing with sentiment analysis of short texts in social media. The method can more accurately understand and interpret the sentiment information embedded in Chinese texts, providing valuable support for in-depth sentiment analysis and decision-making [32], with the following formula:

$$p(C_i|W_1, W_2, W_3, \ldots W_n) = \frac{p(W_1, W_2, W_3, \ldots W_n\,|C_i) \times p(C_i)}{p(W_1, W_2, W_3, \ldots W_n)}, i = 0, 1$$

where the random event C_i denotes the probability of the sample being sentiment positive or negative for class C, and X_n denotes the probability of a feature word X appearing in the test sample. The output is between [0, 1]; the closer the value is to 1, the more positive the sentiment of the comment is.

3.2. Spatial Analysis Methods

3.2.1. Kernel Density Analysis

Kernel Density analysis method is a commonly used non-parametric analysis method in spatial analysis [33], which is mainly used to portray the spatial density characteristics and distribution trend of research objects. Traditional kernel density analysis typically employs a fixed search radius (bandwidth); however, this approach has obvious limitations when dealing with spatially unevenly distributed data. Specifically, high-density regions may lose details due to excessive smoothing, while low-density regions may generate noise due to insufficient smoothing [34]. To solve this problem, this paper introduces the Adaptive Bandwidth Selection method to optimize the results of kernel density analysis.

$$f(x) = \frac{1}{nh^d}\sum_{i=1}^{n} k\left(\frac{x - x_i}{h}\right)$$

where d is the dimension of the point data, k() denotes the computational equation of the kernel function, h is the search radius, i.e., the kernel bandwidth, and $x - x_i$ denotes the distance from the hypothesized point to x_i.

3.2.2. Geographical Detector

Geographical detectors are a statistical method for detecting the spatial dissimilarity of a geographic factor and revealing the driving forces behind it. It has the advantage of detecting both numerical and qualitative data, as well as the interaction of the two factors and the strength, direction, linearity, or not of the interaction [35]. Its expression is:

$$q = \left(N_{\sigma^2} - \sum_{h-1}^{L} N_h \sigma_h^2 \right) / N_{\sigma^2}$$

where N and are the sample size and variance of the non-missing samples, respectively, and are the sample size and variance of the influencing factors of the h category, and L is the number of classifications of the influencing factors of the h category. q takes the range of [0, 1], and the larger the value, the factor indicators have stronger the explanatory power of the factor indicators of the spatial distribution.

4. Results

4.1. Public Perception Analysis of ICH

4.1.1. Results of ICH Keyword Extraction Based on an Improved TF-IDF Algorithm

This paper collected approximately 1000 terms related to ICH from ICH-related websites and publicly available ICH terminology databases, covering multiple categories such as traditional crafts, folk activities, performing arts, traditional medicine, sports competitions, oral traditions and expressions, handicrafts, food culture, architectural techniques, and traditional culture. We used the Jieba word segmentation tool to segment Weibo texts and, in combination with part-of-speech tagging tools, classified the words into four major categories: ICH-related terms, nouns, verbs, and adjectives. Among these, ICH-related terms and noun-based keywords point to topics and objects of public interest; verb-based keywords reveal public behavioral tendencies and engagement levels, further subdivided into key verbs and general verbs; while adjective-based keywords express public emotional attitudes. In computational linguistics, words of different parts of speech contribute differently to semantic meaning. ICH-specific terms serve as core anchors for ICH culture and possess far greater explanatory power regarding text semantics than general vocabulary; therefore, they should be assigned a higher weighting coefficient. Key verbs serve as the core carriers of actions in the transmission of ICH culture and the practice of skills; they act as the central hub connecting ICH-specific terms with behavioral logic and are crucial for the public's semantic expression. The association strength between general nouns and ICH themes is lower than that of ICH-specific terms but higher than that of adjectives and general verbs. From the perspectives of information gain and class discrimination probability, ICH domain-specific terms serve as strong discriminative features for determining whether a text belongs to the ICH theme, exhibiting significant domain-specific uniqueness and thematic directionality. To reinforce their core representational role and highlight their domain-specific value, this study sets their weight to twice the baseline value. This configuration aligns with the fundamental principle in feature weighting that strong discriminative features are assigned multiplied weights. Using key verbs as the baseline (1.0), ICH-specific terms are set to 2.0 due to their strong discriminative power; common nouns, adjectives, and common verbs are assigned weights of 0.8, 0.6, and 0.4, respectively, following the statistical pattern of decreasing information gain, thematic distinctiveness, and semantic

contribution. The weight differences exhibit a uniform, stable, and linearly decreasing pattern, consistent with the principle in computational linguistics that feature importance is proportional to weight. These values are used solely to characterize relative differences in importance, are independent of subjective preferences, and possess statistical objectivity and interpretability.

In summary, this study combines domain-specific text weighting theory and part-of-speech semantic function theory from computational linguistics, while also taking into account the cultural expression characteristics of intangible cultural heritage (ICH) texts, to allocate weights to words of different parts of speech, as shown in Table 2. Ultimately, the top 50 keywords ranked by TF-IDF values were extracted from Weibo texts (as shown in Figure 2), with a significant increase in the proportion of ICH proper nouns, effectively reflecting the public's focus on the core content of ICH.

Table 2. TF-IDF weighting table.

Part of Speech	Weight	Example	Weight Allocation Logic
ICH terminology	2	Paper-cutting, embroidery, inheritors	Core terminology, which directly determines the text field
Key verbs	1	Heritage, Protect, Develop	Directly reflecting the state of NRM protection
Common nouns	0.8	Culture, Video, Nation	Generic terminology, not core features
Adjectives	0.6	Excellent, Unique	Preserve modifying information, but not overly intrusive
General verbs	0.4	Perform, Produce, Show	Low importance of general verbs

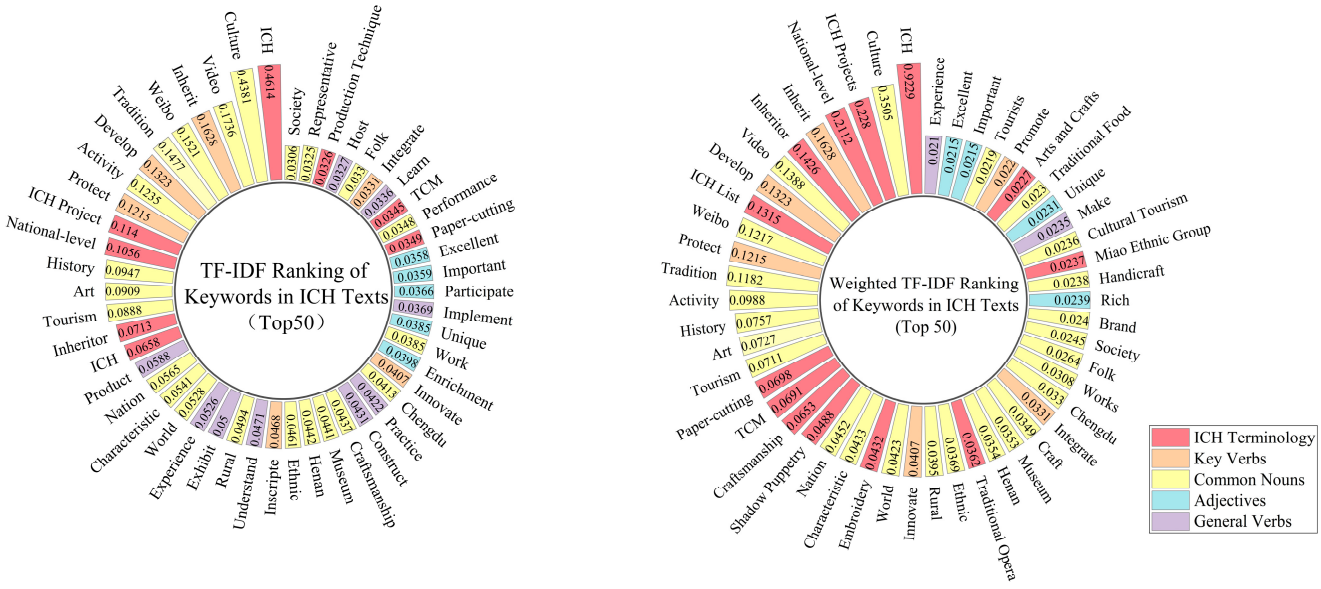


Figure 2. TF-IDF result map. (**a**) shows the TF-IDF ranking distribution of the Top 50 keywords in ICH texts; (**b**) presents the weighted TF-IDF distribution of the Top 50 keywords in ICH texts after introducing part-of-speech weights. Different colors correspond to the part-of-speech categories of keywords.

By comparing the TF-IDF ranking results before and after applying weighting to keywords in ICH texts (as shown in Figure 2), it is clear that the weighting algorithm exhibits significant structural differences in its ability to filter and highlight core information. After weighting, the distinctive characteristics of terms specific to the ICH field became particularly evident. Specific craft and project names with strong ICH attributes—such

as “paper-cutting,” “traditional Chinese medicine,” “traditional crafts,” and “shadow puppetry”—specific craft names and project titles with strong ICH attributes—not only saw a significant rise in their rankings but also saw a substantial increase in their proportion within the Top 50 keywords. This indicates that the weighting algorithm effectively filtered out interference from general-purpose corpora and precisely identified the core carriers and material manifestations of ICH culture. At the same time, the weight of key action verbs was further strengthened; terms such as “innovation,” “integration,” and “promotion” became more prominent in the weighted rankings, intuitively reflecting the public’s high level of attention to the pathways of ICH transmission and development, as well as methods of cultural revitalization, when discussing ICH. Overall, the TF-IDF weighted algorithm, through differentiated weight allocation, has enhanced its ability to capture core concepts, key behaviors, and specific domains of ICH, thereby optimizing the accuracy of keyword extraction from ICH-related texts. This approach makes the keyword results more focused on the intrinsic characteristics of ICH and the public’s core concerns, enabling a more precise and objective reflection of the public’s perceptions, priorities, and value orientations regarding ICH culture within the Weibo domain. It lays a more solid foundation for subsequent analyses of ICH dissemination characteristics and thematic exploration.

4.1.2. Public Perception Analysis Based on LDA Topic Mining

This paper performs LDA modeling and topic analysis on processed Weibo text, utilizing the pyLDAvis module for visualization. In the pyLDAvis visualization results, the degree of topic overlap serves as the core criterion for measuring topic distinctiveness. This study conducted multiple rounds of validation on model results with different numbers of topics: when K was set to 4 or higher, the visualization results showed significant spatial overlap between the newly added topics and the original ones, failing to form independent and distinct topic dimensions, and resulting in a significant decline in topic distinctiveness; However, when K = 3, the three themes exhibited a discrete distribution in the visualization, with no significant overlap, resulting in optimal theme distinctiveness. Additionally, considering the convenience of subsequent analysis, the ICH-related Weibo posts were categorized into three core themes. Therefore, the final determination was to set the number of core themes at three, which were summarized as the three primary themes: ICH Inheritance and Development, ICH Introduction and Promotion, and Public Experience and Participation (as shown in Figure 3).

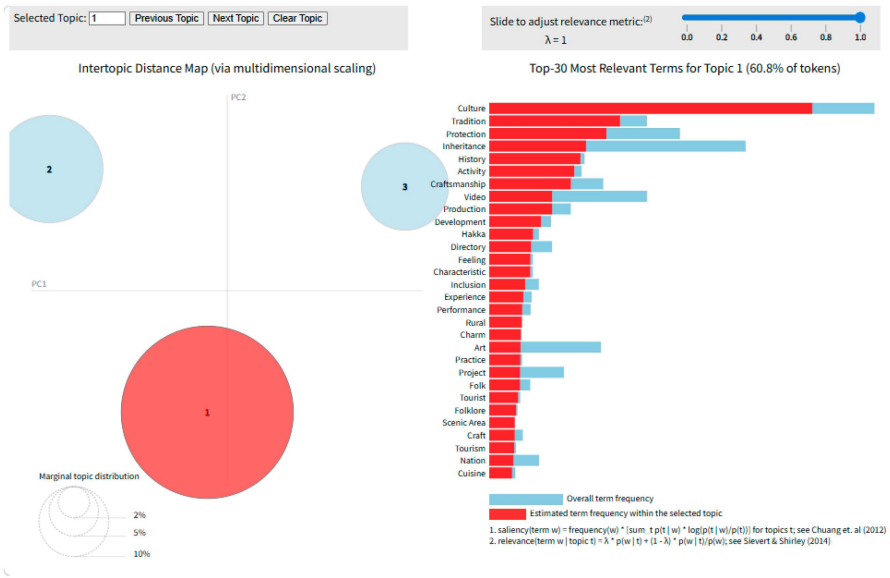


Figure 3. Examples of Exploring Intangible Cultural Heritage Themes.

To further refine the thematic structure and accurately capture the content hierarchy of blog posts on intangible cultural heritage, this paper dissects and summarizes each of the three core themes identified by the LDA model. The specific procedure relies primarily on the output results from the LDA visualization tool pyLDAvis: in the pyLDAvis interface, when no theme is selected, the feature word bar chart on the right appears blue, representing the frequency of that feature word across the entire corpus; after selecting a specific theme, the feature words are reordered based on their frequency within that theme, and the bar chart simultaneously turns red. Building on this, the term-topic relevance is adjusted by modifying the λ parameter ($0 \leq \lambda \leq 1$) in pyLDAvis: when λ approaches 0, the visualization prioritizes unique, high-discriminatory-power terms specific to that topic, better aligning with the topic's core essence; when λ approaches 1, it prioritizes high-frequency, general-purpose terms. Through iterative tuning of the λ parameter, this study identified the most distinctive core feature terms for each topic, thereby preliminarily delineating several subcategories. For topic bubbles in the model output that exhibited high semantic overlap and blurred boundaries, manual review was employed to consolidate them, ultimately forming a hierarchical topic structure of "3 core topics + 19 secondary topics," as shown in Table 3.

Table 3. Thematic trait words.

Primary Theme	Secondary Theme	Core Feature Word
ICH inheritance and development	National cultural development	Miao, Li, Tujia, ethnic, drums, carrying, innovative, heritage, self-confidence, precipitation, dialect, passing on the flame, minorities
	policy protection	Law, synergy, justice, supervision, emergency response, safeguards, reinforcement, mechanisms, infrastructure, advancement, strengthening, rule of law, grass-roots, construction, improvement, acceleration, initiatives
	ICH and Business	chairman, trade, tea, banking, data, auction, finance, company, business, e-commerce, enterprise, old, operation, restaurant, consumer
	Project Inheritance	List, public, announced, representative, evaluation, yellow wine, declaration, project, Buddhism, selected, Ministry of Tourism, recognized
	Rural Revitalization	Countryside, revitalization, media, nationwide, farmers, heritage, video, live streaming, peasants, rural areas, skills, tinsel flowers
	Talent Cultivation	Vocational, bamboo weaving, art, enrollment, exams, college entrance exams, colleges, admission, grades, talent, skills, masters, technology, workshops
	ICH and Internationalization	International, Headline, Country, President, Article, Expo, Video, Attend, Opening Ceremony, Global, Peace, News, Shocking

Table 3. *Cont.*

Primary Theme	Secondary Theme	Core Feature Word
ICH introduction and promotion	Education and Promotion	Into the school, classroom, paper-cutting, students, hands-on, children, course, volunteer, home decoration, training class, lecture
	ICH and History and Culture	New Year's paintings, ancient books, place names, cultural relics, archaeology, cultural cities, museums, sites, cultural preservation, protected areas, architecture, literature, restoration, libraries, porcelain
	Activities and Events Promotion	Competition, hosting, tourism festival, expo, exhibition, Hefei, event, exhibition, seminar, art festival, launch, competition, cultural festival, promulgation, organization
	ICH Crafts	brewing, tea making, brocade, weaving, process, paper burning, fermentation, ancient method, finished product, process, production, preparation, handmade, skill, tea culture,
	ICH Arts	works, carving, embroidery, wood carving, creation, technique, pattern, tie-dye, painting, stone carving, embroidery, suona
	Introduction to Customs	temple fair, dragon boat, sacrifice, cowherd, hairpin, ancestor worship, circulation, legend, Mazu, lunar calendar, Dai, blessing, custom, dumplings, traditional festival
	ICH and Health	Health, therapy, Chinese medicine, treatment, orthopedic, disease, medicine, hospital, Mr., medicine, method, patient, effect
	ICH and opera	Music, Opera, Performance, Drama, Peking Opera, Qu, Repertoire, Singing, Drama, Theater, Publishing House, Theater Troupe, Poetry, Rap, Qinqiang
	ICH and costumes	Fashion, Shu embroidery, national style, designer, fashion week, director, Forbidden City, aesthetics, design, national tide, clothing, elements, Chinese style, creativity
	Media Communication	Popularization, video, People's Daily, channel, film, movie, people's network, netizen, column, propaganda, narration
	ICH and Ethnic Culture	Wushu, taijiquan, Yi, Mongolian, lion dance, Zhuang, waking lion, Tibetan, traditional martial arts, incense bun, torch festival, mountain song, grassland

Table 3. *Cont.*

Primary Theme	Secondary Theme	Core Feature Word
public experience and participation	Volunteer Service	Practice, summer, team, college students, research, field, status, visit, contribution, survey
	ICH and tourism	Travel, route, Beijing embroidery, destination, attraction, hit, lodging, reception, tourists, culture and tourism, tourism, beautiful scenery
	ICH and Cuisine	Cuisine, flavor, snack, delicious, yummy, mutton, radio, TV, taste, texture, hotpot, beef, cooking
	Daily Life	Sugar painting, like, thanks, home, feel, worth, attention, movie, life, photo, old people, documentary, mom, opportunity, game

The theme of ICH transmission and development centers on key elements related to ICH preservation, covering topics such as "ethnic cultural development," "policy protection," "commercial development," "project transmission," "rural revitalization," "talent cultivation," and "internationalization." Analysis of blog content reveals that the public is not only interested in ICH itself but also engages in reflection and discussion regarding the institutional framework for ICH transmission, national policy support, ICH transmission bases and practitioners, ICH brand building, and international exchange. The "Introduction and Promotion of Intangible Cultural Heritage" theme primarily encompasses media dissemination, educational and event-based promotion, as well as introductions to intangible cultural heritage skills, customs, and culture. The public engages with and learns about intangible cultural heritage through various visual art forms, and online media serves as a crucial vehicle for its dissemination and promotion. Blog posts under the "Public Experience and Participation" theme mostly document the public's actual experiences and involvement with ICH. Sub-themes include college student volunteer services, cuisine, tourism, and daily life. This indicates that the transmission of contemporary ICH has moved beyond the "museum-centric" model, instead using volunteer services as a connecting thread and daily life and consumption as settings to attract an increasing number of people to learn about and participate in ICH.

Overall (as shown in Figure 4), posts related to "inheritance and development" and "ICH Introduction and Promotion" account for a high proportion, totaling 84%, while "Public Experience and Participation" accounts for only 16%. This structural characteristic clearly reflects that, the dissemination of ICH in the current Weibo sphere remains characterized by institutional dominance, a promotional orientation, and macro-level narratives. This was further verified upon reviewing the raw Weibo data: in terms of content publishers, the primary contributors of ICH-related posts on the Weibo platform are government cultural departments, ICH preservation organizations, cultural media outlets, and official accounts of ICH inheritors. Consequently, the content naturally leans toward macro-level introductions and promotions, as well as discussions on pathways for inheritance and development; In terms of content presentation, related posts primarily consist of text-based popular science explanations, policy interpretations, and showcases of achievements. There is a scarcity of sharing-oriented content that focuses on the personal experiences, participation processes, and genuine feelings of the general public, and there is an even greater lack of interactive and experiential content design aimed at the public. This data presentation aligns closely with the results of the thematic distribution.

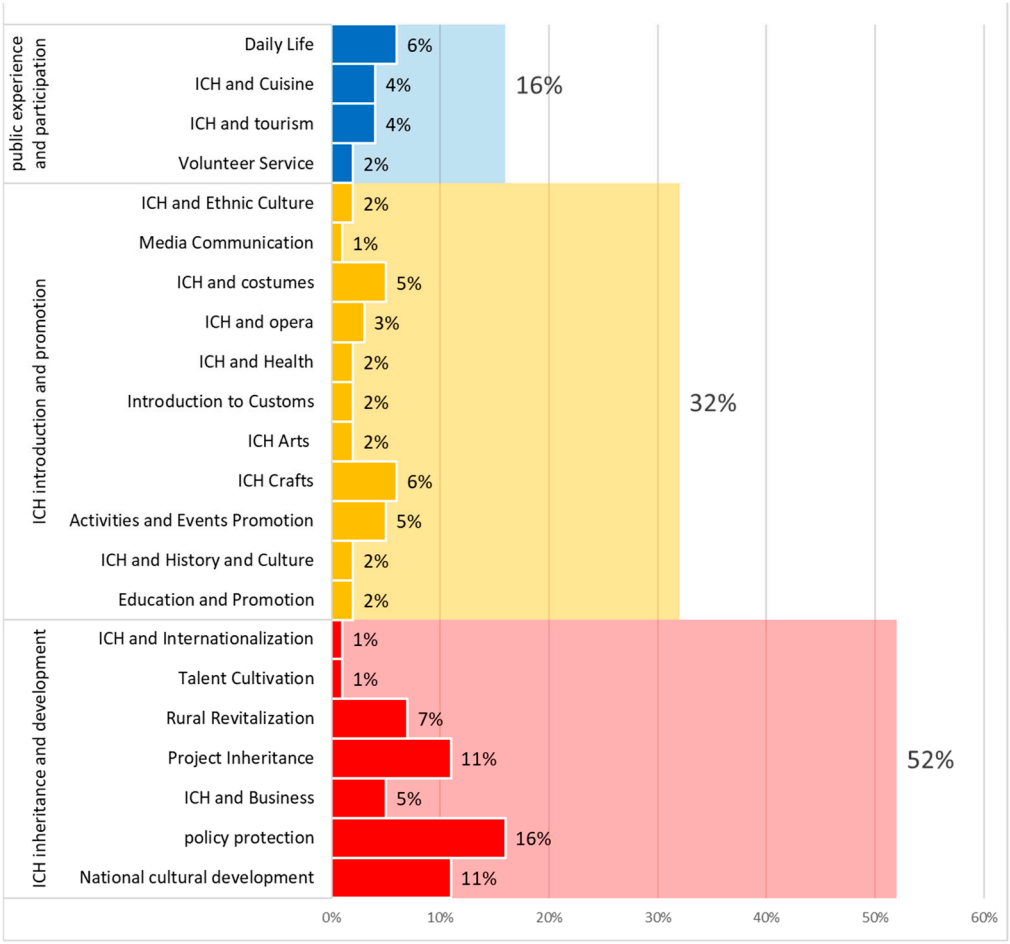


Figure 4. Percentage of Various Intangible Cultural Heritage Categories.

Looking at specific dimensions, the core topics in ICH inheritance and development are "Policy Protection" (16%), "Project Inheritance" (11%), "Ethnic Cultural Development" (11%), and "Rural Revitalization" (7%). Among these, the "Policy Protection" topic—which accounts for the highest proportion—primarily consists of policy documents, work notices, and news analyses released by government departments and official media outlets such as People's Daily Online. Ordinary netizens rarely initiate discussions on these topics. While such content effectively conveys the state's protection priorities and fosters a social atmosphere that values ICH, it tends to be overly official and formal, remaining distant from the public's daily lives and lacking interactivity. In contrast, themes related to ICH introduction and promotion reveal a clear preference for concrete, tangible elements. The public shows greater interest in "ICH crafts" (6%), "ICH and clothing" (5%), "event and competition promotion" (5%)—tangible cultural symbols and vehicles for dissemination. Such concrete content lowers the cognitive barrier, breaks down the perception of ICH as niche and distant, and brings ICH into the public eye in a more vibrant form, providing an effective entry point for cultural outreach and traffic conversion; In terms of public experience and participation, the focus is primarily on experiential scenarios such as "daily life" (6%), "intangible cultural heritage and cuisine" (4%), and "intangible cultural heritage and tourism" (4%). This result indicates that daily life, cuisine, and tourism provide the public with low-threshold channels for engaging with intangible cultural heritage, integrating it into everyday life and laying a cognitive foundation for deeper future participation; However, this proportion also indirectly reflects that current ICH dissemination pays insufficient attention to the public's willingness to participate, experiential needs, and motivations for interaction. Public-facing experiential activities, practical scenarios, and

participation channels remain limited in scale, coverage, and promotion, failing to fully stimulate the public's enthusiasm for participation and willingness to share. Consequently, the public's content output and engagement levels regarding ICH experiences and practical participation remain generally low, making it difficult to establish a dynamic transmission model where "everyone participates and everyone disseminates".

4.1.3. Characterization of Public Sentiment Based on SnowNLP

Since the corpus of the SnowNLP sentiment classification module is not specifically designed for intangible cultural heritage classification, and its internal word segmentation method is not effective either, direct application would affect the accuracy of sentiment prediction. Therefore, this paper uses the Weibo text corpus to train the Bayesian model built into SnowNLP to obtain a corpus specific to intangible cultural heritage and embeds the Jieba word segmentation into the SnowNLP sentiment analysis model. The newly trained model is then used to classify the sentiment of Weibo texts. Due to the massive volume of comment text data, which is more authentic and interactive compared to blog texts, it can more accurately and deeply mine the public's sentiment towards intangible cultural heritage content. Thus, this paper utilizes the sentiment analysis function of the SnowNLP library based on the principle of the Naive Bayes classifier to calculate the sentiment values of 57,448 public comments. To objectively verify the optimization effect of the retrained SnowNLP model in the task of text sentiment classification in the field of intangible cultural heritage, this study designed a control experiment with the original SnowNLP model as the control, and selected accuracy, precision, recall, and F1-score as the core evaluation indicators. The experimental statistical results are shown in Table 4. From the final classification results, it can be seen that the accuracy and precision of the optimized sentiment classification model are higher than those of the original model.

Table 4. Comparison of Sentiment Analysis Results.

Classification Method	Accuracy	Category	Precision	Recall	F1
Original SnowNLP	0.795	Positive	0.712	0.879	0.787
		Negative	0.835	0.763	0.797
Optimized SnowNLP	0.845	Positive	0.838	0.926	0.880
		Negative	0.893	0.864	0.878

The sentiment scores range from 0 to 1. As shown in the frequency distribution of sentiment values (as shown in Figure 5), the samples exhibit a gradual distribution in the 0–0.3 range, a fluctuating upward trend in the 0.3–0.6 range, and a significant increase in frequency reaching a peak in the 0.6–1 range. Considering both the text content and the distribution characteristics, the traditional classification method using 0.5 as the threshold does not align with the actual distribution pattern of the data and yields poor classification results. Therefore, this paper optimizes the sentiment intervals based on the distribution pattern: comments with scores less than 0.3 are classified as negative, those between 0.3 and 0.6 as neutral, and those greater than 0.6 as positive, in order to more accurately reflect public sentiment trends.

After conducting sentiment analysis and statistical analysis on the entire sample of comments, the results show that (as shown in Figure 6), within the Weibo public discourse, the public's overall attitude toward intangible cultural heritage exhibits a significantly positive trend, with a total of 42,256 positive comments, 11,829 neutral comments, and 3363 negative comments. The proportions of these three categories are shown in Figure 6. Based on the quantitative results, the public's overall attitude toward ICH is significantly positive, indicating a high level of social recognition for ICH. This positive public sentiment

provides a favorable opportunity for the dissemination of ICH. Relevant departments and practitioners can leverage social media platforms to further promote high-quality content, such as demonstrations of ICH skills and stories shared by practitioners, thereby strengthening the public's emotional connection to ICH.

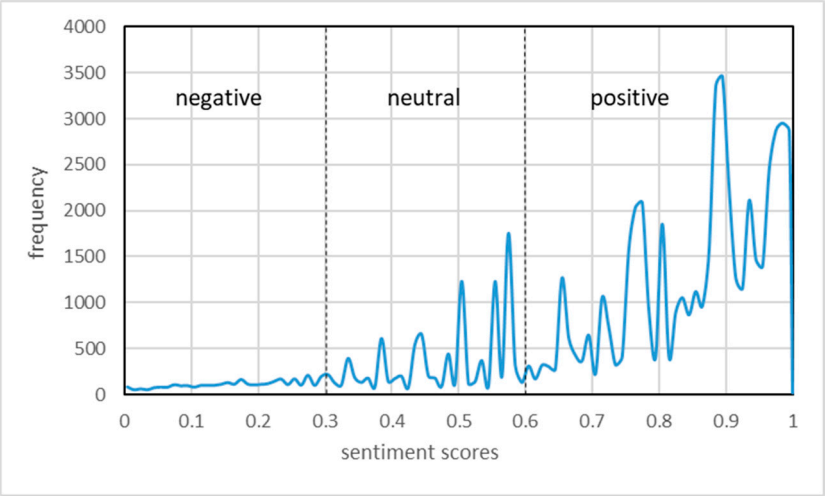


Figure 5. Frequency Distribution Chart of Public Sentiment.

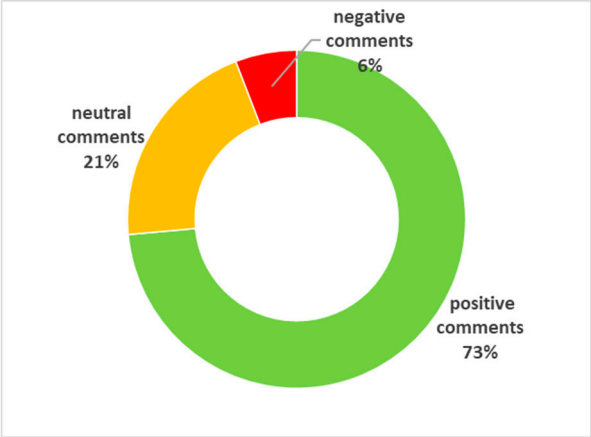


Figure 6. Percentage of positive, neutral, and negative reviews.

To gain a more intuitive understanding of the public's attitudes toward intangible cultural heritage across China's provinces, this paper utilizes the spatial analysis and visualization capabilities of GIS to create regional sentiment maps, thereby visually presenting the sentiment landscape toward intangible cultural heritage in each province. The results show that the public in all provinces holds a positive attitude toward ICH, with average sentiment scores exceeding 0.73. As shown in Figure 7, developed coastal regions in the east—such as Zhejiang, Jiangsu, Guangdong, Fujian, and Shanghai—as well as certain central regions, including Hunan and other provinces and municipalities, rank at the top in terms of sentiment scores, while provinces and autonomous regions such as Heilongjiang, Jilin, Gansu, the Tibet Autonomous Region, and the Guangxi Zhuang Autonomous Region exhibit slightly weaker sentiment compared to other regions. Additionally, this study employs the kernel density estimation method to analyze the spatial density characteristics of ICH projects. The kernel bandwidth was determined by taking into account both the scale of the study and the desired representational effect. Following extensive testing and comparison of various parameter sets, a bandwidth of 200 km was selected for the analysis. This aims to present a coherent and holistic spatial clustering pattern of national-level ICH

items at the national scale, highlighting macro-regional clustering characteristics whilst avoiding the issue of local fragmentation caused by excessively narrow bandwidths. Concurrently, sensitivity analyses were conducted using multiple bandwidths (100 km, 150 km and 200 km) to verify the robustness of the results. The findings indicate that the spatial locations and distribution patterns of core high-density zones, such as the Beijing-Tianjin-Hebei region and the Yangtze River Delta, remain stable, with only minor variations in their extent and boundaries. This demonstrates that the analytical results possess sound scientific robustness and reliability. As shown in Figure 8, the overall spatial density of national-level ICH projects exhibits a "dual-core, multi-center" distribution pattern. In the north, Beijing serves as the core, radiating out to the North China region, including Tianjin, Hebei, and Shanxi; in the south, Shanghai serves as the core, radiating out to the Yangtze River Delta region, including Jiangsu, Zhejiang, and Anhui. In terms of quantity, the spatial distribution exhibits a pattern of higher density in the east and lower density in the west, with a concentration in the North China Plain and the middle and lower reaches of the Yangtze River Plain. Zhejiang, Shandong, and Shanxi are the provinces with the highest number of national-level intangible cultural heritage projects. Combined with regional sentiment maps, it can be observed that the spatial differentiation of cultural sentiment regarding intangible cultural heritage is influenced by more than just the number of projects.

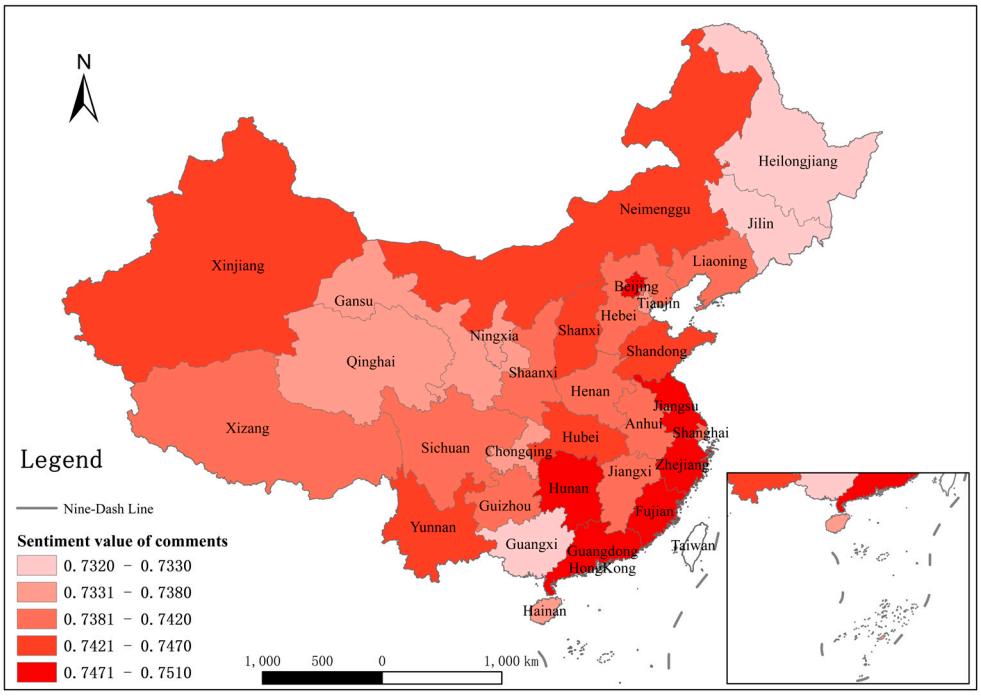


Figure 7. Distribution of Public Sentiment.

4.2. Analysis of Factors Influencing Regional Emotional Differences

The regional difference characteristics of public sentiment are the result of the joint action of multiple factors, and their spatial difference status should be comprehensively explored from multiple perspectives. To explore the explanatory power of different drivers on the spatial divergence of public sentiment, this paper uses geographic probes to analyze the factors by factor probes in terms of socio-economics, education level, and cultural exchanges, to further explore the factors that influence regional sentiment differences. As shown in Table 5.

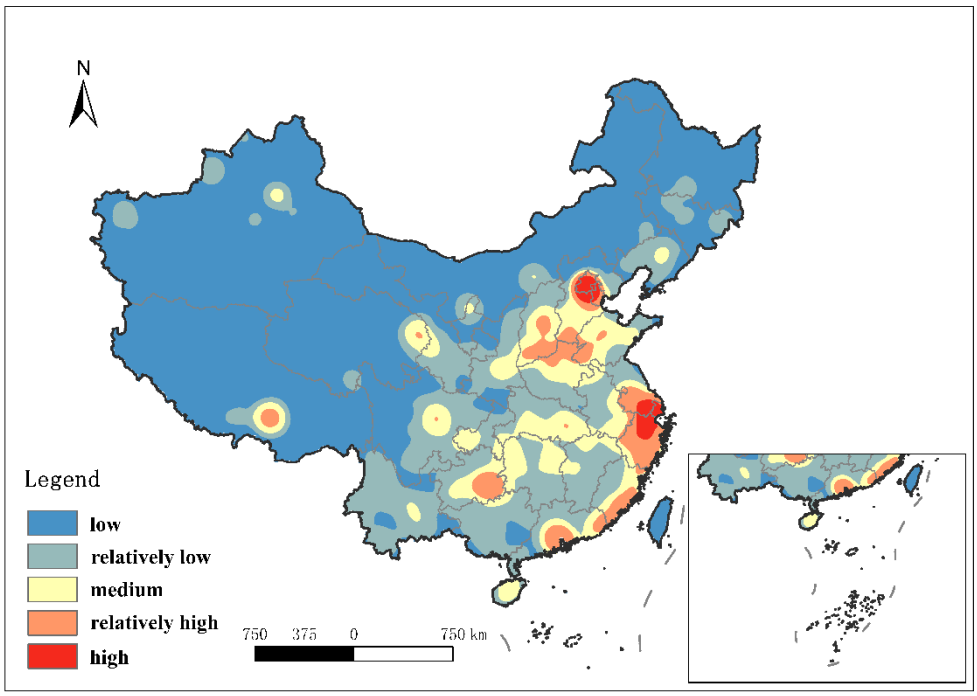


Figure 8. Map of the results of the National Intangible Cultural Heritage Kernel Density.

Table 5. Multi-category drivers of ICH emotions.

Dimension	Driving Factors	Interpretation
Socio-Economic	Level of economic development	GDP (x1)
	Population size	Population size (x2)
	Transportation environment	Highway mileage (x3)
Education Level	Cognitive base	Number of university graduates (x4)
	Distribution of Educational Resources	Education expenditure (x5)
	Distribution of Educational Resources	Number of tertiary institutions (x6)
Cultural Exchange	Cultural Preservation Efforts	Number of museums (x7)
	Tourism resources	Number of scenic spots (x8)
	ICH inheritance situation	Number of ICH inheritors (x9)
	ICH inheritance situation	Number of ICH projects (x10)

4.2.1. Geological Survey Results

The results were obtained through analysis using the geographic detector (as shown in Table 6). The spatial distribution of public sentiment is influenced by a combination of factors, and the driving forces among the various detection factors vary in magnitude. Ranked from highest to lowest, they are: number of ICH items (0.699) > number of ICH inheritors (0.632) > GDP (0.458) > education funding (0.352) > number of scenic spots (0.348) > population (0.284) > number of higher education institutions (0.243) > number of university graduates (0.172) > number of museums (0.157) > total road mileage (0.106). This indicates that the number of intangible cultural heritage (ICH) items, the number of ICH practitioners, and regional GDP influence the emotional spatial distribution pattern of China's ICH to a greater extent than other factors. Among these, the number of ICH items reflects cultural depth and diversity; ICH items provide local residents with more cultural choices and experiences, strengthening people's sense of identity and belonging to local culture; ICH bearers serve as both living repositories of intangible cultural heritage and the "stewards" ensuring its intergenerational transmission, thereby promoting the innovation

and development of ICH skills; regional economic development not only facilitates the formation of local ICH projects but also fosters the deep integration of ICH with modern culture and technology, enhancing the quality and dissemination influence of ICH; High-density clusters of ICH are predominantly distributed in economic hubs, primarily because these hubs possess significant advantages in terms of historical and cultural heritage, financial and technical support, and market demand, which provide a solid foundation for the aggregation and development of ICH; Meanwhile, the synergistic development effect between the tourism industry and GDP in coastal provinces serves as a key practical manifestation of the correlation between positive sentiment and regional economic levels. Educational attainment determines the public's capacity for cultural understanding and awareness of cultural heritage preservation; the tourism industry facilitates the exploration and realization of ICH value; the number of museums promotes cultural exhibition and dissemination; and transportation infrastructure fosters cultural exchange and integration regarding ICH.

Table 6. Geophysical Survey Results.

Rank	Dimension	Measurement Factor	q	*p*
1	Cultural Exchange	number of ICH items (X_{10})	0.699	0.001
2	Cultural Exchange	number of ICH inheritors (X_9)	0.632	0.002
3	Socio-Economic	GDP (X_1)	0.458	0.002
4	Education Level	education funding (X_5)	0.352	0.015
5	Cultural Exchange	number of scenic spots (X_8)	0.348	0.013
6	Socio-Economic	population (X_2)	0.284	0.006
7	Education Level	number of higher education institutions (X_6)	0.243	0.016
8	Education Level	number of university graduates (X_4)	0.172	0.023
9	Cultural Exchange	number of museums (X_7)	0.157	0.021
10	Socio-Economic	total road mileage (X_3)	0.106	0.038

4.2.2. Results of Factor Interaction

The interaction exploration heatmap (Figure 9) shows that the interaction between any two factors exhibits a two-factor enhancement effect; that is, the explanatory power when the two factors act together is significantly higher than the q-value when either factor acts alone. This demonstrates that the emotional spatial differentiation of intangible cultural heritage is the result of the synergistic interaction of multiple factors, which intertwine to jointly shape local emotional attitudes and perceived values toward intangible cultural heritage. Specifically, the interaction Q-value between GDP (X1) and the number of ICH projects (X10) reached as high as 0.968, while the interaction Q-value between the number of ICH practitioners (X9) and GDP (X1) was 0.925. This indicates that the synergistic effect of economic development levels and the endowment of core ICH resources has the most significant impact on the public's emotional response to ICH. regions with stronger economic foundations and richer ICH resources tend to elicit more positive public emotional responses. The interaction q-values for the number of ICH projects (X10) and the number of ICH inheritors (X9) with other factors generally exceed 0.75, indicating that ICH resource endowment serves as the core anchor driving emotional differences; when combined with factors such as economy, education, and cultural tourism, it further amplifies the positive impact on ICH-related emotions. The interaction q-values for secondary factors such as population, transportation, and higher education institutions are relatively low, mostly ranging between 0.4 and 0.7. This suggests that when these factors act individually or in

combination, their driving effect on public sentiment toward ICH remains weaker than the synergistic effect of core resources and economic factors.

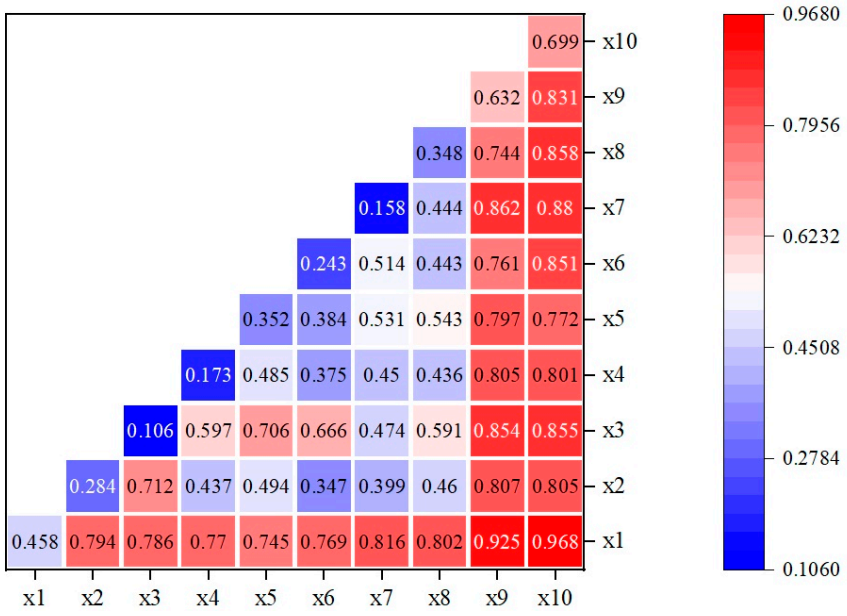


Figure 9. Geodetector inter-variable interaction detection results map.

5. Discussion

This paper approaches the study of intangible cultural heritage (ICH) from the perspective of public perception. Unlike previous analyses that have primarily focused on conceptual theories or spatial characteristics of ICH, this study explores the characteristics and variations in public perception of ICH by mining vast amounts of social media text data, thereby providing a more micro-level theoretical perspective and empirical evidence for ICH research. Through this research, we have found that:

(1) Keyword extraction based on the TF-IDF weighted algorithm highlights ICH-specific terms such as "paper-cutting" and "traditional Chinese medicine," as well as key verbs like "innovation" and "integration." This reflects that public attention toward ICH has shifted from static preservation to a modern path of living transmission and cross-border integration, embodying society's demand for the "creative transformation and innovative development" of ICH. The LDA topic modeling clustering results show that "public experience and participation" accounts for only 16%, indicating a significant structural imbalance. This reflects that current ICH dissemination is primarily institution-led and publicity-oriented, with insufficient public experience and interaction. There is a tendency to prioritize form over experience and dissemination over interaction, which will hinder the penetration of ICH culture and the creation of emotional resonance. Therefore, shifting ICH dissemination from one-way information dissemination to two-way interactive experiences and building a more inclusive and participatory dissemination ecosystem should be key to enhancing the effectiveness of ICH social media dissemination, as well as increasing public engagement and cultural identity. In the future, efforts could explore the establishment of online immersive ICH experience platforms and the implementation of diverse participatory practices, such as ICH community workshops, campus experience classes, and online co-creation activities, to encourage the public to transition from "spectators" to "participants." However, the feasibility and dissemination effectiveness of such models still require further evaluation.

(2) The public's emotional attitudes toward ICH are generally positive, but 6% of the public still express negative sentiments. Negative comments center on three dimensions: "lack of awareness," "negative experiences," and "anxiety about transmission," directly pointing to the current shortcomings in ICH development: In terms of product supply, some ICH products overemphasize cultural symbols while neglecting practical value and adaptability to modern life; in terms of consumer experience, high product pricing, scarce experiential settings, and limited participation channels raise barriers to consumption and engagement; regarding cultural transmission, public concerns about a shortage of ICH talent and a generational gap in skills reflect the need to improve long-term mechanisms for living heritage transmission. To address these issues, the government and relevant researchers can formulate targeted policy improvements: First, strengthen the popularization and dissemination of ICH by leveraging new media tools such as short videos and live streaming to break through spatial and temporal constraints and resolve the "lack of awareness" problem; second, optimize product supply by guiding inheritors to integrate modern demands, promoting the fusion of ICH skills with practical products and fashion elements to lower barriers and enhance accessibility; Third, improve the safeguarding mechanisms for transmission by increasing support for inheritors and refining talent development systems to mitigate the risk of a generational gap; fourth, establish platforms for public participation by organizing interactive activities such as hands-on experiences and cultural and creative competitions, thereby shifting the public's attitude from "passive observation" to "active participation" and enhancing emotional identification.

(3) Regarding the mechanisms of emotional spatial differentiation, this study found that the number of ICH projects, the number of inheritors, and regional GDP have a more significant impact on the emotional spatial pattern of ICH. This is because regions with a larger scale of ICH projects and inheritors are more likely to form a cultural agglomeration effect, attracting public attention and stimulating positive emotions; meanwhile, a region's economic level determines its capacity to invest resources in ICH protection and promotion, with economically developed regions able to provide more adequate funding and safeguards for ICH transmission. Taking coastal provinces as an example, these regions are rich in ICH resources and have deeply integrated them with the tourism industry, creating distinctive cultural tourism products. This not only drives regional economic growth but also provides sustained financial support for ICH preservation, creating a virtuous cycle. However, it is important to note that this emotional spatial differentiation, driven by disparities in economic levels and resource endowments, implies underlying issues of regional equity and development risks. Economically developed regions leverage their resource advantages to create a virtuous cycle for ICH development, whereas economically underdeveloped regions, due to a lack of funds, technology, and talent, find themselves trapped in a dilemma of "insufficient resources—low public attention—weak emotional identification" regarding ICH transmission and dissemination, which may further exacerbate regional imbalances in ICH development. Therefore, in practical application, economically underdeveloped regions can collaborate with developed regions. Such cooperation should adhere to the principles of "adapting to local conditions and mutual benefit." While introducing capital and technology from developed regions, the focus should be on preserving the local characteristics of ICH in underdeveloped regions. A two-way collaborative mechanism should be established to ensure that underdeveloped regions retain a voice in ICH development, thereby promoting balanced spatial development of ICH and achieving the goal of "protecting diversity and promoting shared development."

(4) The strategies for the protection and dissemination of intangible cultural heritage proposed in this study are not limited to the Chinese context; they are equally applicable and offer valuable insights across diverse cultural and economic backgrounds. Many countries worldwide have established mature systems for the protection of intangible cultural heritage, and their practical approaches align with the core concepts emphasized in this study, such as safeguarding transmission, public participation, experiential guidance and innovative development. For instance, in terms of training practitioners, Japan has established a comprehensive publicly funded training system; through rigorous selection, systematic skills training and a master-apprentice model, it provides a practical pathway that can be emulated by countries with varying levels of economic development and cultural backgrounds; In terms of promotion and outreach, France has created a platform for public participation through 'Heritage Days', Japan has fostered public awareness of conservation through socio-cultural movements, and South Korea has integrated ICH knowledge into school curricula. These diverse promotional approaches align with this study's philosophy of stimulating public engagement; regarding resource utilization, the United States has utilized digital technology to facilitate the sharing and innovation of ICH resources, whilst South Korea has adopted the 'ICH+' model to promote the integration of culture and tourism. The ICH preservation practices described above, emerging from diverse cultural contexts and varying levels of economic development, fully validate the universality of this study's conclusions. They also provide a multifaceted reference for future ICH preservation efforts, which can be flexibly adapted to the cultural traditions and economic foundations of different countries and regions, thereby achieving an organic integration of the living transmission of ICH with local development.

6. Conclusions

Intangible cultural heritage serves as a vital vehicle for China's outstanding traditional culture and plays a significant role in preserving national culture and strengthening cultural confidence. Social media offers new avenues for researching public perception. By analyzing public perception, sentiment, and spatial variations regarding intangible cultural heritage through social big data, we can accurately identify public needs, providing a scientific basis for the living transmission and targeted promotion of such heritage. This approach holds significant research value and practical significance for overcoming the challenges of disseminating intangible cultural heritage and enhancing its social influence.

The main conclusions of this study are as follows: (1) This study collected a large volume of posts and comments from the Weibo platform; however, the data still suffers from the following shortcomings: the demographic characteristics of Weibo users are highly concentrated among young urban residents. This characteristic may lead to a bias in the representativeness of the sample; such a bias may result in the over-representation of emotional expressions and cognitive tendencies in urban areas, whilst the true perceptions of rural areas, middle-aged and elderly groups, and residents of lower-tier cities have not been adequately captured, thereby affecting the accuracy and comprehensiveness of inferences regarding regional emotional distribution. Furthermore, as this study utilized data from a single year (2023) for cross-sectional analysis, there are certain limitations in the temporal dimension, making it difficult to fully reveal the long-term evolutionary patterns and dynamic trends in public perceptions of intangible cultural heritage. Future research could expand the temporal scope and scale of data collection to construct multi-year time-series datasets, thereby systematically tracking the diachronic changes in the dissemination of ICH and public perception. Furthermore, by broadening data sources to include multiple platforms such as Xiaohongshu and Douyin and conducting comparative

analyses, whilst integrating offline survey data to compensate for the limitations of online data, the accuracy and richness of perspective of the research findings could be further enhanced, providing more robust support for the protection, transmission and promotion of ICH. (2) Regarding sentiment analysis, this study retrained and optimized the sentiment analysis model using a corpus specific to the ICH field, significantly improving the accuracy of sentiment recognition in ICH contexts. Analysis of public sentiment characteristics revealed that the public's overall emotional attitude was positive, with average sentiment scores exceeding 0.73. Certain developed regions along the eastern coast, such as Zhejiang, Jiangsu, Guangdong, Fujian, and Shanghai, ranked among the highest in sentiment scores. (3) Regarding the mechanisms of spatial differentiation in sentiment, this study found that regional variations in public sentiment result from the combined effects of multiple factors. The explanatory power of the interaction between any two factors is higher than that of a single factor. Compared to other influencing factors, the number of ICH projects, the number of ICH inheritors, and regional GDP have a more significant impact on the spatial distribution pattern of ICH sentiment in China.

The limitations of this study and future directions are as follows: (1) Although this study collected a large amount of data on posts and comments from the Weibo platform, issues such as a single data source and a limited time frame still exist, which may affect the comprehensiveness of the research results to some extent. Future research could expand the temporal scope and scale of data collection, incorporate data from multiple platforms such as Xiaohongshu and Douyin for comparative analysis, and combine online data with offline survey data to address the limitations of online-only research. This would further enhance the accuracy and richness of perspectives in the research findings, providing more robust support for the protection, transmission, and promotion of ICH. (2) Although this paper improved the SnowNLP model to enhance the accuracy of sentiment value calculation, there are still shortcomings in the fine-grained classification of sentiment analysis, and the adopted "positive–neutral–negative" classification method carries a certain degree of subjectivity. Future research will optimize the sentiment analysis system in two aspects: first, by further refining the existing model to refine the hierarchical dimensions of positive and negative sentiments, optimize classification criteria, and reduce biases caused by subjective judgments; second, by introducing mainstream sentiment analysis models such as BERT and RoBERTa. Through multi-model comparative experiments, we will analyze the performance differences in various models in the context of sentiment analysis for ICH texts, select models with stronger adaptability and higher objectivity, and thereby enhance the reliability, objectivity, and richness of sentiment analysis results. (3) Although this study selected 10 influencing factors to examine regional sentiment differences, other factors such as the quality of digital infrastructure, the intensity of local education policies, and cultural expenditures were not included in the research framework. This has, to some extent, weakened the comprehensiveness and explanatory power of the model. In the future, a more comprehensive system of driving factors will be constructed.

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Data Availability Statement: The Weibo data and intangible cultural heritage (ICH)-related data employed in this study were collected via web crawling from publicly accessible official online

platforms. All the data sources are open to the public, and no private or restricted information was involved in the research.

Conflicts of Interest: The authors declare no conflicts of interest.

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