How Do Geographical Factors Affect the Distribution of Intangible Cultural Heritage: A Case Study of Xinjiang, China

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Abstract: Intangible cultural heritage (ICH) is the essence of excellent traditional culture and the treasure of human civilization. At present, major countries pay more and more attention to the study of ICH. Therefore, it is of great significance to study the spatial distribution characteristics of ICH and to understand the factors affecting the development of ICH. Systematically studying the spatial distribution patterns, influencing factors, differentiation characteristics, and formation mechanisms of ICH is essential for effectively promoting its protection and development, guiding the planning of cultural tourism, and implementing cultural power strategies. There are clear differences between municipal and county-level ICH in Xinjiang. The overall distribution trend shows a spatial aggregation structure with more ICH in the north and fewer in the south. ICH resources are concentrated mainly in Kashgar, Yili, Tacheng, Bazhou, and Urumqi, where the Urumqi-Turpan-Korla region is the high-density core area for all types of ICH. Meanwhile, the Yining and Kashgar areas have a large number of non-relics. Ethnic distributions, cultural environments, policy supports, and other social and cultural factors have greater impacts on the spatial distribution of ICH in Xinjiang, while natural geographical environment factors such as runoff water systems and average precipitation have less influence. Interaction studies revealed that the synergistic effects of natural, economic, and social and cultural factors had a more profound influence on the spatial distribution of ICH. Lastly, to promote sustainable development, suggestions were made to optimize the spatial layout, protection, and development of Xinjiang ICH.

Keywords: intangible cultural heritage; spatial distribution; influencing factors; geo-detector; Xinjiang

1. Introduction

Intangible cultural heritage (ICH) is a unique cultural landscape that is primarily embodied by human beings and takes the form of traditional culture. It possesses significant cultural, historical, aesthetic, and tourist values [1,2]. With the rapid development of globalization, ICH has become an important consideration for governments worldwide striving to enhance their cultural competitiveness, making the protection of intangible cultural heritage a global consensus. In China, ICH rooted in its civilization carries the core of Chinese traditional culture within its spatial boundaries. However, these traditional ways of production and life are under serious threat in modern society undergoing comprehensive economic and social transformation, posing problems such as the flooding of ICH, excessive marketization, and inheritance crisis, which are increasingly prominent [3,4]. As such, ICH faces severe challenges and crises in terms of its inheritance and development. The key to the protection and development of ICH lies in exploring its profound cultural connotations, identifying the connection points between ICH and contemporary life, activating the modern significance of ICH, and realizing the reproduction of the cultural and socio-economic values of ICH. This issue is highly relevant and critical to the current field concerned with ICH.
As a form of traditional culture, ICH has been passed down from generation to generation and garnered significant international attention. In 1972, the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated the Convention Concerning the Protection of World Cultural and Natural Heritage, which introduced evaluation criteria for “intangible” world cultural heritage, laying a solid foundation for defining the connotation of ICH [5]. In 2003, UNESCO adopted the Convention for the Safeguarding of the Intangible Cultural Heritage at its 32nd General Assembly, stipulating the specific meaning and content of ICH. China joined the convention in 2004, making ICH protection an integral part of the country’s planning. Furthermore, in 2011, the People’s Republic of China enacted the Law of Intangible Cultural Heritage, which defines the example for people from all ethnic groups and their cultural heritage as components of various traditional cultures, including physical objects and places associated with these cultures. Recently, the protection and inheritance of ICH have risen to the national level with the 14th Five-Year Plan released in March 2021, which emphasized systematic protection of ICH in promoting excellent traditional Chinese culture. Local governments at all levels also introduced relevant laws and regulations for protecting intangible cultural heritage. For a long time, ICH rooted in Chinese civilization carried the essence of traditional Chinese culture within its spatial boundaries.

For thousands of years, China has established a multi-ethnic and multi-cultural environment through the inheritance of its history, gradually gaining recognition as one of the four ancient civilizations in the Eastern world. The aim of China’s cultural construction during the 14th Five-Year Plan period is to promote the development of China’s exceptional traditional culture. This objective includes passing down and refining traditional Chinese culture, promoting the systematic protection of important cultural and natural heritage, ICH, as well as cultivating the innovative transformation and development of refined traditional Chinese culture. The realization of the Chinese Dream and the great rejuvenation of the Chinese nation are inseparable from ICH [6], or what is also called “living fossil”. ICH is not only a community of humankind but also serves as a treasure of history, culture, beautiful mountains, and rivers, and a showcase of our civilization to the world. Therefore, ICH holds practical and strategic significance in building a harmonious socialist culture, stimulating creativity, and promoting cultural diversity [7].

International research on heritage protection and tourism development primarily focuses on the realism of heritage in tourism development, commercialization of heritage tourism development and the transformation of dynamic mechanisms [8], development planning for heritage tourism, and sustainable development [9,10], tourism development of ICH, and satisfaction evaluation [11]. Additionally, community participation and stakeholder rights [12] and impact measurement and evaluation [13] are also commonly considered. Previous studies have utilized interdisciplinary methods, incorporating sociology, anthropology, and ethnology theories while applying case analysis and model construction, along with methods such as literature induction, participatory observation, in-depth interview, questionnaire survey, and ethnographic research [14,15]. Despite these efforts, there remain some limitations in the study of intangible cultural heritage, including the lack of consideration of overall protection and utilization of ICH, a focus on qualitative research rather than quantitative research.

Spatial pattern is an important field in the study of cultural geography, and the cultural landscapes that are not important relics also show various spatial distribution characteristics. A study on Jordan found that cultural heritage was concentrated in the area around the capital and distributed along river channels and traffic arteries [16]. Garcia et al. studied the effects of seasonal oscillation of the Indus River and its tributaries on the number and spatial distribution of sites in the Indus River basin through GIS spatial analysis and remote sensing image interpretation [17]. Another study on China found that economically developed areas, river basin buffer zones, plain areas, and other regions are important gathering areas of ICH [18]. The study of the spatial distribution characteristics of ICH is of great significance for the objective understanding of the process of the generation and
evolution of regional cultures and the promotion of cultural protection and development. Therefore, this study aims to explore the spatial distribution characteristics of ICH in Xinjiang from the perspective of spatial differences and stratified heterogeneity, so as to provide reference for decision-makers to make more accurate and detailed cultural tourism planning.

Scientific analysis of the influencing factors on the spatial layout of ICH is essential for exploring its present characteristics, formation reasons, and future protection and development [19,20]. Different nationalities have nurtured unique cultural types in specific geographical and historical contexts, displaying regionalism and nationalism [21–23]. Natural background environments and social and economic conditions give rise to distinct cultural heritages. Based on a review of the literature, there are mainly two aspects that affect the spatial distribution of ICH resources. On the one hand, natural environmental factors play a crucial role. Previous studies have demonstrated that terrain, climate, water resources, soil, vegetation, among others, significantly influence the spatial distribution of ICH resources [24,25]. Additionally, some studies have specifically identified climate and water resources as having a more noticeable impact on cultural heritage [18]. On the other hand, social factors such as population distribution, transportation, policies and regulations, and the social environment also have an evident effect on the spatial distribution of ICH [26]. It is noteworthy that the contribution of these influencing factors may vary from region to region. For example, Diolinda et al., (2020) pointed out that transportation conditions in economically developed areas had more significant impacts on the spatial distribution of ICH [27]. Although some studies have investigated the factors affecting the spatial distribution of ICH, most of them focus primarily on social and economic factors and natural factors. Relatively few studies have examined the influence of cultural factors. Therefore, this study considers the socio-economic, natural, and cultural factors that affect the spatial distribution of ICH.

This study differs from the previous literature in several ways. Prior research has mainly focused on sociology and tourism, with limited attention given to the spatial aspects of geography. Additionally, most studies have either taken a national approach to investigate ICH or focused on specific types of ICH, while few have examined a specific region. For example, Xinjiang is an important hub along the ancient Silk Road and boasts rich cultural heritage assets. Preserving ICH plays a vital role in promoting high-quality regional development, fostering traditional culture, and safeguarding national cultural traditions. Moreover, prior studies have primarily examined the qualitative impacts of influencing factors on the spatial distribution of ICH, with little exploration on how such influences operate quantitatively. The analysis of hierarchical heterogeneity or interactions among factors regarding this issue is rare. Employing quantitative techniques to examine the factors that impact the spatial distribution of ICH can improve the reasonable allocation of ICH resources, provide a scientific foundation for integrating ICH resources, and contribute toward achieving differentiated protection and inheritance of ICH.

The rest of the study is arranged as follows. Section 2 presents the analysis framework for the factors influencing the spatial distribution of ICH, along with a description of the data sources and methods adopted in this study. Section 3 examines the spatial characteristics and influencing factors of ICH in Xinjiang. The results of our analyses are discussed in Section 4, followed by conclusions in Section 5.

2. Materials and Methods

2.1. Study Areas

Xinjiang is the largest provincial-level region in China, with a vast area and numerous mountains and glaciers (Figure 1). Xinjiang has rich tourism resources, rich folk customs, and colorful folk customs activities. Xinjiang is a gathering place of diverse cultures in China, where the nomadic culture of the grassland and the farming culture of the Central Plains blend and converge to form cultural forms with unique regional characteristics, colorful cultural wealth and life genes of national prosperity [28]. The Uygur, Han, Kazak,
Hui, Mongolian, Kirgiz, and other ethnic groups have lived in Xinjiang since ancient times. Herding nomadic culture and farming culture of the Central Plains blend and converge here to form a cultural form with unique regional characteristics, and inherit world-class intangible cultural heritage such as the Uyghur Daolang Mesigrefu, Manas, and Vigur Muqam. The complex and diverse geographical environment as well as the splendid and colorful traditional culture with a long history have preserved considerable cultural heritages in Xinjiang. By May 2021, Xinjiang had 141 national-level ICHs (ranking eighth in China), of which 3 (Muqam Art, Manas, and Meisrefu) were inscribed on the UNESCO Intangible Cultural Heritage List.

2.2. Determinants of ICH and Their Proxies

Based on previous studies, we constructed an analytical framework to analyze the driving factors affecting the spatial distribution of ICH (Figure 2). The spatial distribution of ICH is affected by multiple factors. Combined with the cultural geography theory and the research progress of ICH, various influencing factors are integrated into three categories: natural factors, economic factors, and social and cultural factors. Specific indicators and definitions are shown in Table 1.

![Figure 1. Map of study area in Xinjiang, China.](image1)

![Figure 2. Determinants and their proxy variables concerning the spatial distribution of ICH.](image2)
Physical environmental factors determine the basic conditions of the ICH project itself. On the one hand, human activities are more frequent in regions with superior natural environment, and good regional characteristics are conducive to the generation and development of the ICH. On the other hand, the region with suitable climate and horizontal water system is conducive to the origin and spread of civilization [29]. In our study, three indexes X1 Topography, X2 River system, and X3 Mean precipitation were selected to analyze the influences of natural environment factors on the spatial distribution of ICH.

Economic factors reflect the development level of regional economy. The development of industrial economy provides material conditions for the development of ICH projects, convenient transportation facilitates the dissemination and diffusion of ICH projects, and agricultural economy is the economic basis of the ICH. Economically developed areas can provide talent funds, infrastructure, science and technology support for the protection and development of ICH projects [30]. In this study, four indexes, X4 Economic development, X5 Urbanization, X6 Agricultural industry and X7 Traffic elements, were selected to analyze the influence of economic factors on the spatial distribution of ICH.

Sociocultural factors are the environmental conditions that protect and inherit ICH. On the one hand, the generation of ICH is rooted in the local cultural environment. This process is mainly reflected in the long-term accumulation and inheritance of historical traditions, ways of thinking, habits of behavior and production skills. On the other hand, the development of ICH is obviously influenced by government regulation and related policies [31]. In this study, three indicators, X8 Habitat of nationality, X9 Cultural environment and X10 Policy support, were selected to analyze the influence of economic factors on the spatial distribution of ICH.

2.3. Data

ICH is a significant symbol of a country’s historical and cultural achievements, representing an essential part of its traditional culture. China is one of the countries that places the utmost importance on ICH protection. Currently, China has established national, provincial, municipal, and county-level ICH protection list. They include folk literature, traditional music, traditional dance, traditional opera, quyi (a general term for the Chinese art of speaking, drawing, playing, and singing), traditional sports, recreational arts and acrobatics, traditional arts, traditional skills, traditional medicine, folk customs and so on. These lists represent the core characteristics of China’s ICH and embody the wisdom and excellent civilization of the Chinese nation.
This paper utilizes the national ICH lists from five batches published by the Ministry of Culture and Tourism, PRC, and the provincial ICH lists from four batches published by the Department of Culture and Tourism of Xinjiang Uygur Autonomous Region. To maintain the integrity of the declared areas, ICH items jointly owned by the declared areas were divided according to administrative regions. Ultimately, there were 498 ICH items in Xinjiang, and the longitude and latitude of the vector point data were obtained through the address resolution method of Baidu Map API.

Other relevant data sources: (1.) Topographic data, river system data, and traffic road data were obtained from the Resources and Environment Data Cloud of Chinese Academy of Sciences (https://www.resdc.cn/ 24 February 2023). (2.) Relevant climatic data were obtained from National Meteorological Science Data Center (https://data.cma.cn/ 24 February 2023). (3.) Relevant cultural heritage data come from the website of the State Administration of Cultural Heritage (http://www.ncha.gov.cn/ 24 February 2023). (4.) Relevant social and economic data (economy, urbanization, agriculture, ethnicity) were obtained from Xinjiang Statistical Yearbook. (5.) Data of relevant government work reports come from official websites of governments at all levels.

2.4. Methodology

2.4.1. Nearest Proximity Index

The distribution of ICH in macroscopic space is point-like, and the point-like elements have three forms: uniform, random, and condensed [25]. The nearest neighbor index represents the geographical index of the degree of proximity of point elements to each other in geographical space, and its formula is as follows:

\[ R = \frac{D}{D_i} \]

\( R \) is the nearest proximity exponent; \( D \) is the nearest distance; \( D_i \) is the theoretical nearest proximity distance. \( i \) refers to the number of elements. When \( R > 1 \), it is uniformly distributed. When \( R = 1 \), the distribution is random. When \( R < 1 \), the distribution is concentrated.

2.4.2. Nuclear Density Analysis

Kernel density analysis of ICH takes each ICH point element as the center of the circle and the radius \( h \) as the density value of the unit circle to analyze the process of continuous changes of spatial density in unit area [23]. The formula is as follows:

\[ f(x) = \frac{1}{nh} \sum_{i=1}^{\infty} K \left( \frac{x_i - x}{h} \right) \]

\( f(x) \) represents the kernel density estimation of the kernel density function; \( n \) represents the number of points in the neighborhood; \( h \) stands for bandwidth; \( K(*) \) is the kernel function. The larger the value of \( f(x) \), the denser the distribution of point elements.

2.4.3. Geographical Detector Model

Geographical detector is a spatial analysis model used to detect the relationship between a certain geographical attribute and its explanatory factors, which is widely used in the study of the influencing factors of natural and economic and social phenomena [32]. The geographic detector method is subject to less premise constraints and has obvious advantages when processing mixed type data. It can overcome the limitation of statistical method to deal with variables, so it is widely used in the study of the influence mechanism of social and economic factors and natural environmental factors [33,34]. Factor detection of geographic detector can identify impact factors, and interaction detection can explain the interaction of impact factors on dependent variables, so it is an effective tool to study the driving mechanism of complex geographical factors.

(1) Factor detector
Factor detection modules are typically used to determine specific geographic factors. By comparing the total variance of this index in different regions and the whole study area, the spatial distribution difference is quantified [32]. The formula of q value is as follows:

$$q = 1 - \frac{\sum_{h=1}^{L} N_h \sigma^2_n}{N \sigma^2}$$

(3)

$q$ is the detection value, and $N_h$ is the number of units contained in the detection element. $N$ is the number of units in the whole region; $\sigma^2_n$ and $\sigma^2$ are the variances of $Y$ values of the detected element layer and the whole region unit, respectively. $q = 0$ means that the independent variable has no explanatory power over the dependent variable; $q = 1$ indicates that the independent variable completely controls the spatial distribution of the dependent variable; $q$ value indicates that the control force of independent variable to dependent variable reaches $100q\%$.

(2) Interaction detector

Interaction detectors assess whether the explanatory power of the two factors is enhanced, weakened, or independent of each other. First, we calculate the $q$ values of two factors of $q(X1)$ and $q(X2)$, $X1$, and $X2$. Then, we calculate the $q$ value interaction $q(X1 \cap X2)$, which is a new layer formed by the tangent covering variables $X1$ and $X2$, and combine this value with $q(X1)$ and $q(X2)$ to represent the type of interaction between the two variables [34]. The introduction of the five major types of interaction is shown in Table 2.

<table>
<thead>
<tr>
<th>Interaction Type</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced, nonlinear</td>
<td>$q(X1 \cap X2) &gt; q(X1) + q(X2)$</td>
</tr>
<tr>
<td>Independent</td>
<td>$q(X1 \cap X2) = q(X1) + q(X2)$</td>
</tr>
<tr>
<td>Enhanced, bidirectional</td>
<td>$q(X1 \cap X2) &gt; \text{Max}(q(X1), q(X2))$</td>
</tr>
<tr>
<td>Weakened, single factor nonlinear</td>
<td>$\text{Min}(q(X1), q(X2)) &lt; q(X1 \cap X2) &lt; ax(q(X1), q(X2))$</td>
</tr>
<tr>
<td>Weakened, nonlinear</td>
<td>$q(X1 \cap X2) &lt; \text{Min}(q(X1), q(X2))$</td>
</tr>
</tbody>
</table>

Table 2. Types of interaction between two covariates.

3. Results

3.1. Spatial Distribution of ICH

Xinjiang is rich in ICH resources, with a total of 498 items of ICH resources in the region (including expansion projects). Among them, there are 141 items in 5 batches at the national level and 357 items in 4 batches in the autonomous region level. In terms of regional scale, there are 81 items at the national level in northern Xinjiang, accounting for 57.4% of the total, and 200 items at the autonomous region, accounting for 56% of the total. There are relatively few items in southern Xinjiang. The proportion of ICH at the national level and autonomous region level was 42.6% and 44%, respectively.

At the regional level, Kashi, Yili, Tacheng, Bazhou, and Urumqi are the prefectures with the largest distribution of ICH items in Xinjiang, with the number of national-level ICH items each exceeding 10, accounting for 60.9% of the total number of national-level ICH items in Xinjiang, and the autonomous region-level ICH items accounting for 57.4% of the total. Altay, Changji, Hami, Turpan, Aksu, Hotan, and Kezhou have relatively few ICHs, with 36.2% of the total ICHs at the national level and 40% at the autonomous region level. Bozhou and Karamay have the least number of ICH, with only 3 and 1 items of national ICH, and only 7 and 2 items of autonomous region ICH.

From the perspective of the distribution of ICH types in Xinjiang (Table 3), the state-level intangible aspects, the largest number of traditional music, mainly distributed in Ili and Kashgar, the traditional skills are mainly distributed in Kashgar, Aksu, and Turpan. Folk has no obvious agglomeration area, but is distributed in Kashgar, Ili, and Changji. The folk Literature is mainly distributed in Tacheng. The traditional dance is mainly distributed in Ili and Bazhou. Traditional art, folk art, traditional medicine, traditional sports,
entertainment and acrobatics, and other ICH items are less distributed. The Traditional theatre is still blank. The distribution of the types of ICH items at the autonomous region level is similar to that of the national ICH items. The types of ICH items at the autonomous region level are the most, followed by the types of ICH items such as traditional music, folk custom, traditional sports, entertainment and acrobatics, and traditional dance. The distribution of ICH items such as traditional fine arts, quyi, and traditional drama is less.

Table 3. Spatial distribution of intangible cultural heritage (ICH) projects in Xingjiang.

<table>
<thead>
<tr>
<th>Region</th>
<th>District (National/Provincial Project)</th>
<th>Traditional Skill</th>
<th>Traditional Art</th>
<th>Traditional Sport Entertainment and Acrobatics</th>
<th>Folk Dance</th>
<th>Traditional Theatre</th>
<th>Traditional Medicine</th>
<th>Traditional Music</th>
<th>Folk Literature</th>
<th>Folk Custom</th>
<th>Quyi</th>
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<tbody>
<tr>
<td>North</td>
<td>Xinjiang</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Altay</td>
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<td>0/0</td>
<td>2/4</td>
<td>0/2</td>
<td>0/0</td>
<td>1/2</td>
<td>2/4</td>
<td>1/1</td>
<td>0/1</td>
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<tr>
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<td>0/0</td>
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<td>1/2</td>
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<td>0/2</td>
<td>0/0</td>
</tr>
<tr>
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<td>0/1</td>
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<td>1/0</td>
<td>1/3</td>
<td>3/3</td>
<td>1/1</td>
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<td>0/0</td>
<td>1/4</td>
<td>0/1</td>
<td>1/4</td>
<td>0/2</td>
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<tr>
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<td>1/1</td>
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<td>3/6</td>
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<td>South</td>
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<td>Bazhou</td>
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<td>29/68</td>
<td>19/32</td>
<td>22/41</td>
<td>5/10</td>
</tr>
</tbody>
</table>

According to the Nearest Neighbor Distance (Table 4), ICHs of Xinjiang present a state of spatial agglomeration and distribution, and the Nearest Neighbor Distance R = 0.156 < 1, Confidence P is 0.00, indicating that there is a significant spatial agglomeration. Traditional skills, traditional fine arts, traditional music and folk literature have a high degree of agglomeration, and the Nearest Neighbor Distance index R is all less than 0.3. The Nearest Neighbor Distance R of traditional sports, entertainment and acrobatics, traditional dance, traditional medicine, and folk art intangible cultural heritage is between 0.5 and 0.9, showing a significantly weak agglomeration state. The Nearest Neighbor Distance of traditional drama R = 3.13 > 1, indicating that it is uniformly distributed in space.

Table 4. Nearest Neighbour Distance Index of ICHs in Xinjiang.

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>R</th>
<th>Z</th>
<th>P</th>
<th>Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Skill</td>
<td>134</td>
<td>0.227</td>
<td>−17.113</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Traditional Art</td>
<td>25</td>
<td>0.000</td>
<td>−10.820</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Traditional Sport Entertainment and Acrobatics</td>
<td>41</td>
<td>0.498</td>
<td>−6.145</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Folk Dance</td>
<td>47</td>
<td>0.501</td>
<td>−6.547</td>
<td>0.000</td>
<td>Aggregate–random</td>
</tr>
<tr>
<td>Traditional Theatre</td>
<td>4</td>
<td>3.130</td>
<td>8.149</td>
<td>0.000</td>
<td>Aggregate–random</td>
</tr>
<tr>
<td>Traditional Medicine</td>
<td>21</td>
<td>0.601</td>
<td>−3.497</td>
<td>0.000</td>
<td>Aggregate–random</td>
</tr>
<tr>
<td>Traditional Music</td>
<td>97</td>
<td>0.237</td>
<td>−14.380</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Folk Literature</td>
<td>51</td>
<td>0.136</td>
<td>−11.810</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Folk Custom</td>
<td>63</td>
<td>0.384</td>
<td>−9.355</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
<tr>
<td>Quyi</td>
<td>15</td>
<td>0.765</td>
<td>−1.741</td>
<td>0.082</td>
<td>Aggregate–random</td>
</tr>
<tr>
<td>Summation</td>
<td>498</td>
<td>0.156</td>
<td>−40.313</td>
<td>0.000</td>
<td>Aggregate</td>
</tr>
</tbody>
</table>

Note: R: Nearest neighbour index; Z: Probability; P: Multiple of standard deviation.

Based on the fixed-point positioning analysis and kernel density calculation of national and autonomous region-level ICHs in Xinjiang, the results (Figure 3) show that the spatial distribution of ICHs in Xinjiang presents a multi-core group with the characteristic of central agglomeration. The first-level groups with Urumqi–Turpan–Korla as the core, the second-level groups with Yining and Kashgar as the core, and several third-level groups with Tacheng, Hami, and Aksu as the center have been formed. Urumqi–Turpan–Korla group is the region with the most intensive distribution of ICHs in Xinjiang. The number of ICHs in these 3 cities accounts for 26.1% of the total number of ICH in Xinjiang. As
the provincial capital of Xinjiang, Urumqi has the economic and regional advantages of cultivating ICHs. The second group is centered on Kashgar and Yining. Yining is the central city of the Yili River Valley, while Kashgar is an important economic and cultural center of southern Xinjiang. It is also the border area of Xinjiang and Central and South Asian countries, with numerous ethnic minorities and rich folk culture (Kashgar and Ili are mainly inhabited by Uyghur, Hui, Kirgiz, Mongolian, Tajik, Uzbek, and other ethnic minorities). These areas have a good social and cultural environment. The third-level group is mainly centered on the central cities of prefectures, and the ICHs are mainly concentrated in the cities and their surrounding areas.

![Figure 3. Kernel density map of spatial distribution of intangible cultural heritage in Xinjiang.](image)

Various types of ICH also show different spatial agglomeration patterns (Figure 4). Traditional skills have formed high-density areas mainly in Kashgar and Kezhou around the key towns along the Silk Road. Traditional art is mainly formed around Urumqi City of high-density area, and its distribution quantity is small. Traditional sports and entertainment and acrobatics are two secondary density areas formed around Kashgar City and Tashkurgan Tajik Autonomous County. Folk dance and traditional music come into being together, forming high-density areas around Kashgar, Urumqi, and Ili, and sub-density areas around Aksu, Hami, and Kezhou, which are distributed in multiple geographical Spaces. Traditional theatre and quyi are mainly distributed in the economic belt of the north slope of Tianshan Mountains, which has convenient transportation and developed economy. Traditional medicine has formed high-density areas with Urumqi and Yili as the core, and sub-high-density areas with Korla, Turpan, Kashgar, and Hotan. Folk literature is mainly concentrated in Urumqi, Ili, and Bazhou. Folk customs form Yili, Korla, and Urumqi as the core of the high-density agglomeration area.

### 3.2. Factors Influencing the Spatial Heterogeneity of ICH

The $q$ value of the detection results of influencing factors of ICH in Xinjiang was calculated by geographical detector (Figure 5). The results showed that most of the influencing factors had an impact on the spatial distribution pattern of the ICH resources in Xinjiang, indicating that the spatial distribution of the ICH resources in Xinjiang was affected by natural, economic, and social and cultural factors, but the explanatory power of the influencing factors of different elements was different. From the perspective of overall influence dimension, the $q$ value of influence factors is ranked as follows: Sociocultural factors (0.5494) > Economic factors (0.4597) > Physical factors (0.2285). From the perspective of itemized impact factors, the $q$ value of the impact factors is sorted as follows: Cultural environment (0.1856) > Habitat of nationality (0.1849) > Policy support (0.1789) > Economic
development (0.1596) > Agricultural industry (0.1591) > Traffic element (0.1066) > Topography (0.1000) > River system (0.0865) > Mean precipitation (0.0420) > Urbanization (0.0344).

Figure 4. Kernel density analysis of different kinds of municipal-level ICHs in Xinjiang.

The sociocultural factors exhibit the largest geographical detector q value, indicating their significant influence on the spatial distribution of ICH in Xinjiang. Among these factors, cultural environment exerts the greatest impact on the spatial distribution of ICH, followed by ethnic distribution and policy support. The emergence and development of early ICH were deeply rooted in a specific cultural context, while the preservation and inheritance of ICH relied on a conducive cultural environment. Regions with abundant cultural resources possess a cultural foundation for the generation of ICH, as values, modes of thinking, and habits accumulated over time. The declaration and inheritance of ICH are closely linked to the local policy environment, with local policies significantly affecting the assessment and declaration of ICH. Government work reports and cultural and travel planning play a crucial role in determining the protection and inheritance of ICH. Xinjiang, a region where ethnic minorities congregate, accounts for more than 60% of China’s population. Kashgar, Aksu, and Turpan, where more than 80% of ethnic minorities reside, are crucial areas where ICH resources gather in Xinjiang. The distinctiveness and uniqueness of ethnic minority cultural traditions and customs are important features of Xinjiang’s ICH resources.
Figure 5. Detection results of influencing factors on spatial distribution of ICH in Xinjiang. Note: ** indicates significant at the 1% level. * indicates significant at the 5% level.

Economic factors are also important characteristics affecting the spatial distribution of ICH, among which economic base and agricultural development are the leading factors of economic factors. The level of economic development is the basis for promoting the protection and inheritance of ICH. Economically developed areas have perfect infrastructure and supporting facilities, which provide greater development space for the declaration, protection, and inheritance of ICH. Agricultural civilization is an important historical background for the birth of ICH, and a large number of ICHs are associated with agricultural farming techniques and production systems [35]. Transportation factors are also important factors affecting the spatial distribution of ICH. Transportation lines are conducive to the gathering and communication of population. Transportation plays a key role in the process of cultural communication and diffusion and development. Urbanization has a small impact on the spatial distribution of ICH, possibly because rapid urbanization is likely to have a double impact on traditional culture. On the one hand, the development of urbanization is conducive to the promotion of cultural heritage protection in the region. On the other hand, the impact of urbanization on traditional culture and rural civilization cannot be ignored.

Compared with economic factors and sociocultural factors, physical factors have relatively little influence on the spatial distribution of ICH. Natural conditions mainly influence the interaction and dissemination of culture through affecting human production and living space. The climatic environment and traffic conditions in the regions with higher altitudes are not conducive to the development of human activities and agricultural production, and lack of material basis for producing cultural heritage. However, the complex and closed terrain reduces the impact of modern civilization in the region, which is conducive to the preservation of traditional cultural heritage [36]. River system also has a certain influence on the spatial distribution of ICH. Ancient settlements and settlements mainly rely on a certain water area. Compared with the eastern region, Xinjiang has a dry climate, which makes the residential areas have a more urgent need for runoff water system supplemented by ice and snow melt water. However, the impact of mean precipitation on the ICH is not obvious. In Xinjiang, precipitation has a limited impact on runoff recharge, and precipitation is easily and greatly influenced by slope, elevation, and other topographic factors. To some extent, its influence is reflected in the influence of topographic and river factors on the distribution of ICH [37].

Exploring the interaction between physical factors, economic factors, and sociocultural factors that influence the spatial distribution of ICH in Xinjiang is conducive to further
revealing the driving mechanism of physical factors and social and economic factors on the spatial distribution of ICH. The interaction detection results show that the interaction between physical factors, economic factors, and sociocultural factors on the spatial distribution of ICH mainly presents double synergistic and nonlinear synergistic effects, and the dominant interaction among different natural factors is slightly different (Figure 6). Topography and economic factors and sociocultural factors of the interaction effect are strongest. Most factor explanatory power of more than 35%; the runoff water system and economic factors, sociocultural factors in the interaction effect of relatively weak, explaining power factor are between 20 and 32%, and the average precipitation and economic factors, sociocultural factors in the interaction effect of the weakest, and most factor explanatory power less than 25%. The interaction of physical factors, sociocultural factors, and economic factors is greater than the influence degree of single factor, indicating that the factors of the spatial distribution of ICH may be the synergistic effect of physical factors, sociocultural factors, and economic factors; on the other hand, sociocultural factors and economic factors may have a mediating effect. Therefore, physical factors further influence the spatial distribution of ICH by acting on sociocultural factors and economic factors.

Figure 6. Interaction results of influencing factors.

4. Discussion

ICH is a vibrant expression of the world’s cultural diversity, a testament to human creativity, and a crucial foundation for sustainable development. Previous research has explored the nature and characteristics of ICH, as well as its feasibility for protection, development, and inheritance. Giannis et al. (2018) [38] have examined the tension between protecting and developing ICH from economic and political perspectives, while Lombardo et al. (2016) [39] have proposed technical solutions for ICH protection. Our research, from a cultural geography perspective, aims to investigate the spatial clustering patterns and influencing factors of ICH, providing a theoretical basis for future tourism planning and resource utilization.

ICH is the result of the interaction between regional culture, natural environment, social system, and economic conditions. However, existing studies have mainly focused on protecting ICH without considering the natural and cultural environment surrounding it, leading to negative effects such as the inability of ICH to adapt to its regional cultural and ecological environment. To avoid this, ICH protection should rely on the original cultural ecosystem to establish different cultural reserves and carry out effective inheri-
tance and development, ensuring the survival and vitality of ICH and maintaining local cultural characteristics.

Different natural background environment and social cultural environment give birth to different cultural relics. The spatial agglomeration pattern of ICH is not randomly distributed, but is the result of the comprehensive action of many factors. The geodetector model shows that physical factors, economic factors, and sociocultural factors play important roles in determining ICH spatial differentiation. Especially, sociocultural elements have the greatest impact. This is similar to some studies in that the influence of cultural elements on cultural heritage is direct and decisive [40]. Cultural is the essential attribute of ICH. The culture within the region has a strong influence on the spatial distribution of ICH. The long history and rich culture are fertile soil for the growth of intangible heritage. The development of culture and the formation of ICH promote each other. Areas with cultural enrichment are more likely to form ICH agglomeration areas, and ethnic distribution agglomeration. The Uygur, Han, Kazak, Hui, Mongolian, Kirgiz, and other ethnic groups have lived in Xinjiang since ancient times. Herding nomadic culture and farming culture of Central Plains blend and converge here to form a cultural form with unique regional characteristics. Culture plays an important role in this.

Economic factors also have an important influence on the spatial distribution of ICH, which is not consistent with some studies. Some studies have found that economic factors may have a two-way influence on the spatial distribution of ICH, and the development of modern economy may have an impact on historical and cultural heritage [25]. Xinjiang lives in the inland of China for a long time, and its economic foundation is relatively weak due to the long-term blockage of regional environment and other factors. The impact of modern economy on the ICH may be relatively small. Xinjiang, as an important intersection area of the ancient Silk Road, where multiple civilizations and religions converge, has formed a large number of cultural agglomerations due to cultural collision.

Physical environment on the influence of the spatial distribution of ICH is relatively weak. This is slightly different with the previous studies. Some studies have found that human activities tend to promote and restrict natural conditions, abundant topography promotes or hinders the population, and the way of cultural exchange impact on cultural evolution affects the spatial distribution of ICH [41]. Although the geographical environment of Xinjiang is relatively complex, with a large area and abundant resources, different natural geographical environments give birth to different civilizations. Xinjiang has formed a distribution area with Uyghur ICH projects as the main body in southern Xinjiang, while an oasis civilization ICH area with multi-ethnic groups as the main body in northern Xinjiang. Therefore, the natural environment has relatively little influence on the distribution of ICH.

The follow-up study should consider several aspects. This research primarily aims to investigate the spatial distribution of ICH in Xinjiang and its determining factors at a macro scale. It is of great significance for the protection and optimized development of ICH. However, to comprehensively understand ICH, further studies are required at micro levels such as space form, cultural landscape, and residents’ participation and perception. In addition, the analysis of the present situation of ICH tourism in Xinjiang and the evaluation of its potential for tourism development will be the main focus of future research.

5. Conclusions

By analyzing the spatial structure and influencing factors of ICH resources in Xinjiang, this study draws the following conclusions:

(1) ICH at the municipal and county levels in Xinjiang exhibit significant differences. The overall distribution trend shows a spatial aggregation with a “more in the north and less in the south” structure. The number and structure of ICH types are uneven, with traditional music and traditional skills being the main ICH items, while traditional art, folk art, traditional drama, and other ICH items are less distributed.
ICH resources in Xinjiang exhibit an obvious trend of accumulation and distribution, with traditional arts, traditional art, traditional music, and folk literature exhibiting a higher degree of agglomeration. The concentration degree of ICH of traditional sports, entertainment and acrobatics, traditional dance, traditional medicine, and folk art is relatively low. In terms of space, Urumqi–Turpan–Korla is the high-density core area of all types of ICH, and Yining and Kashgar also have a large number of ICH.

The spatial distribution of Xinjiang’s ICH is affected by natural, economic, and social and cultural factors. Different factors have different influences on the spatial distribution of ICH. Social and cultural factors have the greatest influence, followed by economic factors, while physical factors are relatively weak. The interaction study found that the synergistic effect of natural, economic, and social and cultural factors had a more significant influence on the spatial distribution of ICH.

Policy makers should be interested in the results. First of all, as a special cultural heritage, the space depends on the regional natural environment, economic environment and the social cultural environment, ICH aggregation of regional sustainable development has important significance to the promotion of overall regional cultural environment, the ICH resources of Xinjiang mainly presents the assembled continuous distribution, reasonable layout, and the overall protection of ICH resources optimized development. In the future, the protection and inheritance of ICH should be combined with the protection of cultural ecology, and actively explore the construction mode and spatial identification of ethnic cultural protection sites with Xinjiang characteristics. Secondly, it should face up to the reasonable interaction between ICH and Economy. From the analysis of the economic influencing factors of ICH, we know that economy is the condition and driving force for the birth, spread, and protection of ICH, and ICH is also a precious resource for economic development. Economic function of ICH, therefore, should be recognized in the guarantee of national intangible cultural under the premise that the kernel is not to be changed, full play is to be given to the economic effect, as should the promotion of culture industry and tourism—which not only promotes the development of local folk economy, but the resulting economic benefits are able to provide feedback for heritage protection and inheritance and guarantee the living condition of the development.

At present, the construction of the Silk Road Cultural Belt has become an important national development strategy. A large number of ICH are distributed along the Xinjiang section of the Silk Road, and the generation and inheritance of these ICH is closely related to the history and culture of the Silk Road. This conclusion provides important theoretical support for the construction of the National Silk Road Cultural Belt and highlights the strategic significance of the construction of the Silk Road Cultural Belt. Xinjiang is an important part of the Silk Road Cultural Belt construction, as well as the region with the widest range and richest culture. In the process of promoting the construction of the Silk Road Cultural Belt, the protection and development of Xinjiang’s ICH in the future should be placed under the overall planning and coordination of the Silk Road Cultural Belt.

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