



Geographical Pattern and Differentiation Mechanism of Intangible Cultural Heritage in Shanxi Province

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Abstract. Taking 946 intangible cultural heritage items in Shanxi Province as research samples, the geographical pattern and differentiation mechanism of intangible cultural heritage in Shanxi Province were studied by mathematical statistics and spatial analysis. The conclusion shows that the intangible cultural heritage in Shanxi Province presents the spatial distribution characteristics gradually obvious from north to south, and is generally distributed along the Fen River in the form of “one core, two pairs and multiple points” network distribution. On the whole, from the pre-Qin period to modern times, the number of intangible cultural heritage in Shanxi Province presents a changing trend of “high - low - high - low”. According to the analysis of geographical detector, social and economic factors have a greater impact on the spatial differentiation of intangible cultural heritage, but the interaction of natural environmental factors and social and economic factors is more significant.

Keywords: intangible cultural heritage · geographical pattern · influencing factors · geographical detector

1 Introduction

Intangible cultural heritage is an important component of the traditional culture of the Chinese nation with a long history. It is the crystallization of the diligence and wisdom of the Chinese people to carry forward the past and open up the future. In the process of inheritance over 5,000 years, intangible cultural heritage has shown its preciousness and value. In August 2021, The General Office of the State Council issued the Opinions on Further Strengthening the Protection of Intangible Cultural Heritage, which mentioned the main goals of comprehensive and effective protection of intangible cultural heritage, enhanced vitality of inheritance, improved working system and a sound inheritance system by 2035. Thus, the protection and development of intangible cultural heritage has become a major focus of the society.

The protection and development of intangible cultural heritage has been a key issue for scholars at home and abroad for a long time. The research mainly focuses on the value protection of intangible cultural heritage, the research on innovation and development, the research on pedigree and age, and the integration of culture and tourism. However,

non-legacy works are a kind of geographical elements, and scholars have little research on its geographical pattern and differentiation mechanism, and lack of analysis of temporal and spatial evolution characteristics of intangible cultural heritage from the perspective of history. Intangible cultural heritage has the attribute of time, so it is also the focus of future research to analyze the pattern of intangible cultural heritage from the dual perspectives of history and geography.

Shanxi Province has a large number of intangible cultural heritage and many kinds. Through thousands of years of cultural precipitation, it has formed its own unique cultural customs. However, the backward economic development of Shanxi makes its intangible cultural heritage not well protected and inherited. However, under the guidance of The State Council's main objectives in the intangible cultural heritage documents, improving the investigation record system and theoretical research system has become a current hot spot. Therefore, this paper collected 946 intangible cultural heritage projects in Shanxi Province, and used kernel density analysis, SPSS, geographical detector model, etc., to reveal the geographical pattern of intangible cultural heritage projects in Shanxi Province and their differentiation mechanism. It can provide the spatial distribution pattern of intangible cultural heritage for Shanxi Provincial government and contribute to the protection and development of intangible cultural heritage. At the same time, it can provide reference for the construction of Shanxi tourism combined with intangible cultural heritage.

2 Experimental Meth Kernel Density Estimate

Using kernel density to analyze the spatial agglomeration characteristics of intangible cultural heritage in Shanxi Province. The calculation formula is as follows.

$$\hat{\lambda}_h(s) = \sum_{i=1}^n \frac{3}{\pi h^4} \left[1 - \frac{(s - s_i)^2}{h^2} \lambda \right]^2 \quad (1)$$

Where,

“s” is the spatial location of intangible cultural heritage in Shanxi Province;

“s_i” is the intangible cultural heritage that falls on s as the center of the circle;

“h” is the position of the ith intangible cultural heritage point within the radius space.

2.1 Geographic Detector Model

The geographical detector was used to detect the spatial differentiation of intangible cultural heritage in Shanxi Province, and the driving factor was found. q statistic was used to detect the influence factor. The calculation formula is

$$q = (N\sigma^2 - \sum_{h=1}^L N_h\sigma_h^2) / N\sigma^2 \quad (2)$$

Where,

“N” is the sample size of intangible cultural heritage projects in Shanxi Province;

“ σ^2 ” is the variance of intangible cultural heritage projects in Shanxi Province;

“ N_h ” is the sample size of the hth influence factor.

“ σ_h ” is the variance of the hth influence factor;

“ L ” is the number of the hth influence factor;

3 Results and Discussion

3.1 Overall Geographical Pattern

Characteristics of Quantity and Density Distribution of Intangible Cultural Heritage

On the whole, the intangible cultural heritage in Shanxi Province presents a spatial distribution characteristic of gradually obvious degree of agglomeration from north to south, concentrated in Taiyuan Basin, Linfen Basin and southeastern Shangdang area, while relatively few in northern Shanxi. Among the intangible cultural heritage projects in Shanxi Province, traditional skills account for the largest proportion, accounting for 27.06% of the total, while folk arts account for the lowest proportion, only 3.81%. The intangible cultural heritage in Shanxi Province has formed the structural characteristics of traditional skills and scarce folk arts. The reasons for the formation of this phenomenon can be attributed to two aspects, one is the basic constraint effect of natural factors, located in the basin, flat terrain, warm and humid climate, and dense river areas are more conducive to the development of agriculture, but also provide good water and land transportation conditions, thus in the Linfen Basin, Taiyuan Basin more intangible cultural heritage. The spatial distribution of intangible cultural heritage in Shanxi Province is concentrated along rivers, especially in the valley of Yu River, Fen River and Danhe River. If Shanxi Province is divided into the eastern plateau and mountain basin region, the central corridor region, and the western plateau and mountain region, the intangible cultural heritage of Shanxi Province is generally distributed along the central corridor, with more in the east and less in the west. This may be because the central corridor is the main road connecting the northeast and southwest, passing through Datong Basin, Xinding Basin, Taiyuan Basin, Linfen Basin and Yuncheng Basin, and connecting Sanggan River and Fen River, which is suitable for human settlement and development of agricultural civilization. The southwest of Shanxi is the area of Changzhi Basin and Jincheng Basin, and relatively flat terrain is conducive to local agricultural development. These factors have laid a natural foundation for the emergence of intangible cultural heritage. The second is the accumulation of cultural resources. As the provincial capital, Taiyuan has abundant resources, which is conducive to the production of excellent culture. Various cultures emerge in an endless stream, and it is a region where culture is concentrated. However, due to natural factors such as huge mountains and human factors such as historical changes, the inheritance and development of intangible culture are limited, so there are few intangible cultural heritage projects in northern Shanxi. The northern Shanxi region prospered because of its long history of trade with the Mongolian border. However, there are still very few intangible cultural heritage projects in northern Shanxi, due to natural factors such as huge mountains and human factors such as historical changes limit the inheritance and development of intangible cultural heritage.

Spatio-temporal evolution characteristics

A total of 873 intangible cultural heritage items with origin period were collected by the author through screening, accounting for 92.28% of the total. This paper analyzes the temporal and spatial evolution characteristics of intangible cultural heritage in Shanxi Province by analyzing the changing trend of the number of different kinds of intangible cultural heritage projects formed in different historical periods from pre-Qin to modern times.

In general, from the pre-Qin period to modern times, the number of intangible cultural heritage in Shanxi Province presents a changing trend of “high - low - high - low”. Among them, the number of intangible cultural heritage in Shanxi Province in Song, Yuan, Ming and Qing dynasties was 113, 151 and 161, accounting for 12.94%, 17.30% and 18.44% respectively, accounting for 48.68% in total, indicating that the Song, Yuan, Ming and Qing dynasties were the main periods for the formation of intangible cultural heritage in Shanxi Province. The number of Wei, Jin, Southern and Northern Dynasties was the least, accounting for only 4.93%.

In terms of types, intangible cultural heritage of traditional skills appeared in the pre-Qin period, accounting for 17.39% as much as that of the Qing Dynasty, and the manufacturing skills of early pottery and iron utensils reached a high value. The traditional drama intangible heritage of Shanxi Province reached its peak in the Ming and Qing Dynasties, during which the number of drama intangible heritage represented by Jin opera reached 61, accounting for 50.4% of the total drama intangible heritage. The number of traditional music intangible cultural heritage reached a high value in the Wei, Jin and Southern and Northern Dynasties. Buddhist and Taoist music appeared, which was opposite to the proportion of other types of intangible cultural heritage. However, the trend of the proportion of intangible cultural heritage in folk literature, folk custom and traditional skills is roughly similar to that of the overall intangible cultural heritage.

3.2 Spatial Distribution Pattern

It can be seen from Fig. 2 that the intangible cultural heritage in Shanxi Province is generally distributed in the form of a network of “one core, two auxiliary points” along the Fen River. The three core areas are all located in the plateau mountain basin area and the central corridor area in the eastern part of Shanxi Province, among which the “one core” is the high-density core area in Taiyuan (with Taiyuan City as the center and extending in a belt to the southwest). Taiyuan, as the economic, political and cultural center of Shanxi Province, has a profound historical foundation and is easy to form intangible cultural heritage. At the same time, the government supports and actively excavates non-governmental intangible cultural heritage, which promotes the declaration and protection of intangible cultural heritage. Therefore, the distribution of intangible cultural heritage is relatively concentrated and it has become the core of “one core and two copies”. “Double deputy” are Yuncheng - Linfen sub-density core area, Jincheng - Changzhi sub-density core area; Linfen, known as Yaodu in ancient times, has a long history and profound cultural deposits. Yuncheng-linfen and Jincheng-Changzhi have multiple basins with relatively flat terrain and close proximity to Fenhe River, Dan River and other water sources, which is conducive to the formation and development of intangible cultural heritage. Therefore, two sub-density cores with higher density

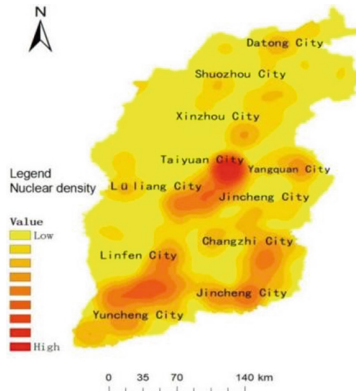


Fig. 1. Total nuclear density in Shanxi Province

of intangible cultural heritage have been formed. “Multi-point” for intangible cultural heritage has also formed a number of small core areas in Datong, Shuozhou, Xinzhou, Yangquan, JinzhongChangzhi junction area and Luliang City (Fig. 1).

3.3 Analysis of Influencing Factors

In the selection of factors affecting the distribution of intangible cultural heritage projects in Shanxi Province, this paper uses natural environmental factors and social and economic factors to analyze.

The natural environment factors are reflected in four aspects: first, the river system (X1) is based on Shanxi Province; second, the average temperature (X2) is based on the average temperature of Shanxi Province from 2010 to 2020; third, the average altitude (X3) is based on the average altitude of prefecture-level cities in Shanxi Province; Fourth, the average precipitation (X4) is represented by the average precipitation of Shanxi Province from 2010 to 2020.

The social and economic factors are reflected in four aspects: first, per capita GDP (X5) is reflected by the average per capita GDP of all prefecture-level cities in Shanxi Province from 2010 to 2020; Population (X6) is represented by the average population of all prefecture-level cities in Shanxi Province from 2010 to 2020. Third, the number of cultural places (X7) is reflected in the number of museums, cultural centers, cultural relic protection units and other institutions in prefecture-level cities of Shanxi Province; Fourth, the number of policies (X8) is reflected by the frequency of search terms of “intangible cultural heritage” in the portals of prefecture-level city people’s governments of Shanxi Province from 2010 to 2020.

Single factor analysis

Through the analysis of the table, it is concluded that q (X7) and q (X8) have significantly stronger explanatory power than other factors, so the number of cultural sites and the number of policies are controlling factors for the spatial distribution of intangible cultural heritage in Shanxi Province. Among the natural environmental factors, $q(X1) > q$

(X4) > q (X2) > q (X3). Culture always tends to be distributed in the warm and open place with dense river network, flat terrain, where people constantly invent and create, so that intangible cultural heritage can be produced and continued. In terms of social and economic factors, q (X8) > q (X7) > q (X5) > q (X6), the distribution pattern of intangible cultural heritage has a direct relationship with the government's policy introduction and the construction of cultural venues. Under the positive guidance and protection of the government, intangible cultural heritage can be better developed and inherited. In addition, people are the prerequisite for the existence and inheritance of culture. The larger the population, the easier it is to collide ideas and generate and inherit culture. Average temperature, per capita GDP and number of policies had a significant impact on the spatial distribution of intangible cultural heritage in Shanxi Province, while other factors did not pass the significance test (Table 1).

Two-factor interaction analysis

By analyzing the interaction results of two factors, it is found that the interaction of each factor is nonlinear enhancement and double factor enhancement. Among them, the interaction between per capita GDP and river system distribution is the strongest, and the areas with dense river network, high economic level and strong government support are the quality places for non-heritage generation and development. The interaction between average temperature and average precipitation and the number of cultural sites is relatively weak, but their factors still play an important role in the distribution of intangible cultural heritage in Shanxi Province. Social and economic factors have a greater impact on the spatial differentiation of intangible cultural heritage, but the interaction of natural environmental factors and social and economic factors is more significant (Table 2).

Analysis of physical geographical factors

Shanxi Province has many basins and mountains, and the temperature gradually decreases from north to south, while the temperature in basins is higher than that in mountains, so the climate is more suitable and conducive to human habitation. Therefore, intangible cultural heritage is more distributed in the central and southern parts of Shanxi

Table 1. Single factor detection results of intangible cultural heritage items in Shanxi Province

Factor		Symbol	q value	p value
Natural environmental factor	River system	X1	0.763	0.106
	Mean temperature	X2	0.625	0.003
	Mean altitude	X3	0.615	0.742
	Mean precipitation	X4	0.741	0.393
Socioeconomic factors	GDPper capita	X5	0.741	0.047
	Population	X6	0.674	0.430
	Number of cultural places	X7	0.800	0.251
	Number of policies	X8	0.987	0.018

Table 2. Interactive results of influencing factors of intangible cultural heritage projects in Shanxi Province

	GDP per capita	Population	Number of cultural places	Number of policies
River system	0.869	0.836	0.799	0.776
Mean temperature	0.735	0.795	0.539	0.79
Mean altitude	0.697	0.679	0.688	0.676
Mean precipitation	0.732	0.703	0.599	0.853

Province. Shanxi Province is located in the upper reaches of the Haihe River and tributaries of the Yellow River, the main stream of which flows west and south of the provincial border. The territory has 5 large rivers, namely the Yellow River basin Fen River, Qin River, Haihe River basin Sanggan River, Zhuozhang River, Hutuo River. Among them, the high-density value area of intangible cultural heritage in Shanxi Province, the core area of “one core and two auxiliary” – Taiyuan City, the sub-density core area – Yuncheng-Linfen is the main area of the Yellow River basin Fen River; Fen River in the Yellow River Basin is the river with the highest density of intangible cultural heritage. It mainly flows through Taiyuan City, the core area of the high-density intangible cultural heritage area, and Yuncheng-Linfen District, the sub-density core area. However, Luliang City, Xinzhou City and Datong City, which lack a certain scale of rivers, are mostly areas with low density distribution of intangible cultural heritage.

Analysis of socio-economic factors

Shanxi is one of the important birthplaces of Chinese civilization. The stable development of society from ancient times has produced many folk arts. Nowadays, there are many intangible cultural heritages in Shanxi, which cannot be separated from the continuous development of economy and human invention. In the era of economic prosperity, people are more in pursuit of abundant spiritual world, and cultural creation and cultural exchange are also promoted. For example, in the Ming and Qing Dynasties, Shanxi Shanxi merchants were famous in the world, and the rapid economic development also promoted cultural exchanges between regions. Most of the intangible cultural heritage of Shanxi drama was produced in this period. Government support is closely related to the development of intangible cultural heritage. The promotion of intangible cultural heritage through government financial support, policy guidance and the establishment of cultural venues can play a crucial role in the protection and inheritance of intangible cultural heritage.

4 Summarize

The intangible cultural heritage in Shanxi Province is large in quantity and rich in types, showing the spatial distribution characteristics gradually obvious from north to south, along the river basin and according to the topography. In the study of its temporal and spatial distribution characteristics, generally speaking, from the pre-Qin period to modern

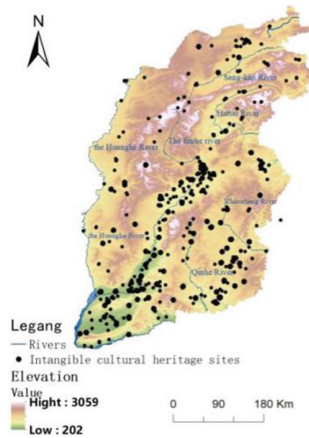


Fig. 2. Distribution map of intangible cultural heritage projects along topography and rivers in Shanxi Province

times, the number of intangible cultural heritage in Shanxi Province presents a changing trend of “high - low - high - low”, which is closely related to the natural geographical factors and social and economic factors. According to the analysis of geographical detector, social and economic factors have a greater impact on the spatial differentiation of intangible cultural heritage, but the interaction of natural environmental factors and social and economic factors is more significant.

For the protection and development of intangible cultural heritage in Shanxi Province, the author has the following suggestions:

Fully introduce intangible cultural heritage into campus life. Let the students fully understand the intangible cultural heritage, and love the culture and establish national confidence in the process of contact. Lay a good mass foundation for future non - genetic inheritance.

Combine intangible cultural heritage with tourism, integrate intangible cultural heritage into scenic spots and resorts in an orderly manner, so that tourists can experience the charm of local culture in the process of traveling and expand the influence of intangible cultural heritage.

Strengthen the innovation of intangible cultural heritage, combine the intangible cultural heritage with the trend elements of The Times, actively carry out cultural and creative product design and literary creation, and stimulate new vitality under the collision of simplicity and trend.

Increase the frequency of intangible cultural heritage performance, increase support for intangible cultural heritage creation, and increase investment in intangible cultural heritage.

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