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Spatial Distribution Pattern and Influencing Factors of Sports Tourism Resources in China

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Abstract: Sports tourism is an emerging tourism product. In the sports and tourism industry, resource mining is the foundation that provides positive significance for theoretical support. This study takes China's sports tourism boutique projects as the study object, exploring its spatial distribution pattern through the average nearest neighbor index, kernel density, and spatial autocorrelation. On the strength of the wuli–shili–renli system approach, the entropy value method and geographic detector probe model are used to identify the driving factors affecting the spatial distribution pattern. Findings reveal the following: (1) From 2013 to 2014, the sports tourism resources in China present a distribution pattern with the Yangtze River Delta urban agglomeration as the high-density core area and the Guizhou–Guangxi border area and the western Hubei ecological circle as the sub-density core areas. (2) From 2014 to 2018, China's sports tourism boutique projects increased by 381, and the regional differences among various provinces tended to converge. The high-density core area remained unchanged. The sub-density cores are now the Yunqian border area of the Karst Plateau, the Qinglong border area of the Qilian Mountains, and the Jinji border area of the Taihang Mountains, shaping the distribution trends of "depending on the city, near the scenery" and "large concentration, small dispersion". (3) The proportion of provincial sports tourism development classified as being in the coordinated stage is 61.29%. (4) The explanatory power of the factors affecting the spatial layout in descending order is natural resource endowment, sports resource endowment, transportation capacity, industrial support and guidance, market cultivation and development, people's living standards, software and hardware services, and economic benefit effects. The explanatory power of the interaction of two different factors is higher than that of the single factor.

Keywords: sports tourism; spatial distribution; geographic detector; influencing factors; China

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1. Introduction

Sports tourism is defined as "the use of sports as a vehicle for tourism endeavor" [1]. In recent years, with the increase in public leisure time, continuous enhancement of fitness awareness, and rapid expansion of tourism consumption, the Chinese government has vigorously promoted the development of sports tourism to satisfy the people's yearning for a better life. The government has called for the creation of sports tourism demonstration zones and encourages the construction of relevant boutique projects. However, in the course of its rapid development in various places, problems such as unreasonable layout, inadequate resource utilization, insufficient capital investment, lack of stadiums, and poor matching of resources with sports characteristics have frequently occurred. As an emerging spatial and regional unit, effective analysis of sports tourism patterns and influ-

encing factors has important practical significance for its layout optimization as well as the sustainable and moderate development.

Current research on sports tourism mainly focuses on the impact on society, economy, and culture. In addition, the characteristics, needs, behaviors, and markets of sports tourists are the exploration hotspots, along with the sports tourism destination planning, product development, and safety management. Cooper and Alderman discussed the influence of canceling sports events on the economy, society, culture, and the environment; in response to the COVID-19, relevant sports tourism alternatives are necessary to promote sustainability [2]. Nishio et al. developed a motivational scale for sports fans (social, achievement, relaxation, and games) and a general tourist motivation scale (escape, nature, shopping, and food) for sports tourism [3]. Jin et al. proposed that the event quality affects the respondents' perceived value, destination image, and behavioral intentions. A structural equation model for related tests ultimately showed that the quality of the event and its perceived value have a significant effect on behavioral intentions [4]. Page et al. compared the safety experience of adventure travelers in New Zealand and Scotland, then commented on the adventure tourism accident compensation legislation and jurisprudence. In addition, the study discussed the injury experience and safety management of adventure travel customers in Queensland and analyzed the adventure travel accidents of inbound tourists from 1982 to 1996 in New Zealand [5].

At present, few studies focus on the spatial structure or distribution of sports tourism resources. Fugao and Li construed the ideal evolution of the spatial structure of sports tourism in the entire region, using spatial structure theories such as growth pole, point–axis, patch–corridor–matrix, and network structure to explain the generation and evolution of the spatial structure of "point–line–surface–domain" [6]. Zuo et al. took the lead in exploring the spatial distribution characteristics of Chinese marathon events. The size of urban populations; living standards; and the overall quality of urban residents (including the concept of sports and leisure), the social environment, and other social mechanism factors affect the spatial distribution of marathon events [7]. Additionally, the spatial distribution characteristics of Chinese marathon events are investigated based on the perspective of natural resources [8]. Geneletti took advantage of geographic information system (GIS) technology with biology, physics, landscape, and other indicators to determine the environmental effect assessment of ski tourism destinations [9]. Thus far, only a few studies have analyzed the spatial distribution pattern of sports tourism resources in China [10,11].

In summary, academic circles have not sufficiently probed the issues of sports tourism and rather focused mainly on account of psychology, management, or behavior. Although a few studies involve spatial structure, the scale is mostly limited to regions, provinces, and cities and therefore lacks a macro-level analysis on the systematic review of the spatial distribution pattern of national sports tourism resources. In view of this, this article systematically sorts out China's sports tourism boutique projects from 2013 to 2018, selecting the nodes in 2014 and 2018. Moreover, the spatial distribution and distribution characteristics of China's sports tourism resources are described through average nearest neighbors, nuclear density analysis, and spatial autocorrelation. In addition, the study uses the entropy weighting method and geographic detector model to identify the driving factors affecting the spatial distribution, making theoretical contributions to the study of the spatial distribution pattern of sports tourism resources. The result builds a systematic index system of influencing factors. It is expected to provide countermeasures for the optimization and healthy development of China's future sports tourism spatial layout, and to provide a reference for the reasonable layout and appropriate development of future sports tourism resources in other countries or regions.

2. Materials and Methods

2.1. Methods

2.1.1. Average Nearest Neighbor

The nearest neighbor distance measures the mutual proximity of sports tourism resources in the spatial distribution. The nearest neighbor index reflects the spatial aggregation characteristics of sports tourism resources, that is, the ratio of the actual to the theoretical nearest neighbor distances [12]. The nearest neighbor index is calculated as

$$ANNI = \frac{ANNO}{ANNE} = 2\sqrt{D} \times ANNO \quad (1)$$

In the above formula, ANN represents the nearest neighbor index, $ANNO$ represents the average nearest neighbor distance, $ANNE$ represents the theoretical nearest neighbor distance, and D represents the nearest neighbor density [12], where

$$ANNE = \frac{1}{2\sqrt{n/A}} = \frac{1}{2\sqrt{D}} \quad (2)$$

In Formula (2), A represents the area of the province and n represents the number of sports tourism resources. When $ANNI = 1$ and $ANNO = ANNE$, the sports tourism resources are randomly distributed; when $ANNI < 1$ and $ANNO < ANNE$, the sports tourism resources are in an agglomerated distribution; when $ANNI > 1$ and $ANNO > A\ NNE$, the sports tourism resources are uniformly distributed. The smaller the $ANNE$, the higher the concentration of sports tourism resources. Both Zuo et al. [7] and Wang et al. [13] used average nearest neighbor to determine the distribution state of the studied elements; quantify the spatial relationship; and judge whether the elements are clustered, random, or dispersed.

2.1.2. Kernel Density

Kernel density analysis is a quantitative estimation of the density of dot-like objects using a moving cell. The assumption is that geographic events can occur at any location in space, but with different probabilities at different locations. The probability of event occurrence is high in areas where dot-like objects are dense and low in areas where dot-like objects are sparse is low [7]. The analytical formula for kernel density is

$$\widetilde{\lambda}(s) = \sum_{i=i}^{n} \frac{1}{\tau^2} k\left(\frac{s - s_i}{\tau}\right) \quad (3)$$

In the above formula, $k(\ )$ represents the kernel function, τ ($\tau > 0$) represents the bandwidth, n represents the number of sample points, and $(s - s_i)$ represents the distance between the dot-like object s and the estimated point s_i [7]. This formula has been tested many times, and the data selection search bandwidth is 333.6 km to more intuitively reflect the spatial distribution of sports tourism resources. Yoo et al. [14] and Allen et al. [15] made use of kernel density in order to determine the center position of a specific element. The density is the highest at the center position, and it decays with distance. The density is zero at the limit distance in the end.

2.1.3. Spatial Autocorrelation (Global Moran's I)

Spatial autocorrelation reflects the degree of correlation between a certain geographic phenomenon or attribute value on a regional unit and the same phenomenon or attribute value on adjacent regional units [16]. This study uses Moran's I index, which is

$$I = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{ij}(X_i - \overline{X})(X_j - \overline{X})}{S^2\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{ij}} \quad (4)$$

In the above formula, ω represents the spatial weight between areas i and j; n represents the number of regions; and X_i and X_j represents the observation values of locations i and j, respectively. The value range of Moran's I is $[-1, 1]$: Moran's $I > 0$ indicates a positive spatial correlation phenomenon, Moran's $I < 0$ indicates a negative correlation phenomenon, and Moran's $I = 0$ indicates an independent random distribution [16]. Zuo et al. [7] and Zhang et al. [17] used global Moran's I to calculate the Moran's I value of the research elements on a continuous spatial scale to explore the strength of the spatial correlation of the research elements and their changes with the spatial scale.

2.1.4. Entropy Method

Compared with the analytic hierarchy process, the entropy method is more objective. The weight is determined mainly based on the information provided by index data, and not by whether the data are linear or not. This method can effectively avoid the interference of human factors and has a higher credibility [18]. Zhang et al. [19] and Li et al. [20] used the entropy method to weight the indicators according to the connection degree of each indicator or the amount of information provided, effectively avoiding the subjective factors of the indicator system results. When constructing the indicator system, this study uses the entropy method to measure the natural resource endowment, sports resource endowment, hardware and software services, transportation capacity, people's living standards, industrial support and guidance, economic benefit effects, and market development in various provinces and municipalities in China to accurately analyze various influencing factors. Thus, this study provides the premise and foundation for the influence of the spatial layout of sports tourism resources.

First, the range standardization is performed on the original data of different magnitudes and dimensions. The formula is

$$q_{ij} = \begin{cases} x_{ij} - min(x_{ij})/max(x_{ij}) - min(x_{ij}) & q_{ij} \text{ is the positive index} \\ max(x_{ij}) - x_{ij}/max(x_{ij}) - min(x_{ij}) & q_{ij} \text{is a negative index} \end{cases} \quad (5)$$

In the above formula, q_{ij} represents the data value after standardized processing; x_{ij} represents the original data value, where i (i = 1, 2, 3, . . . , m) is the sequence number of the evaluation index; j (j = 1, 2, 3, . . . , n) is the number of points; and $max(x_{ij})$ and $min(x_{ij})$ are the maximum and minimum values of the corresponding index of the order parameters at the critical point of system stability, respectively.

The weight of the ith index of a data set containing m indexes and n samples is calculated as

$$W_i = \frac{1 + \frac{1}{\ln n}\sum_{j=1}^{n}\left(\frac{Q_{ij}}{\sum_{j=1}^{n}Q_{ij}}\ln\frac{Q_{ij}}{\sum_{j=1}^{n}Q_{ij}}\right)}{m + \sum_{i=1}^{m}\left(\frac{1}{\ln n}\sum_{j=1}^{n}\frac{Q_{ij}}{\sum_{j=1}^{n}Q_{ij}}\ln\frac{Q_{ij}}{\sum_{j=1}^{n}Q_{ij}}\right)} \quad (6)$$

In the above formula, W_{ij} represents the weight of the ith index; Q_{ij} represents the standardized data value, and each index is summed; and U_{ij} represents the comprehensive

evaluation value of the factors affecting the spatial layout of sports tourism resources. The formula is

$$U_{ij} = \sum_{i=1}^{m} W_i \times Q_{ij} \quad (7)$$

2.1.5. Geodetector

Geodetector is a tool used to analyze and detect spatial differentiation by identifying the extent to which a certain factor explains the spatial differentiation of the result variable, thereby revealing the source of its spatial difference [21]. The formula is

$$q = 1 - \frac{\sum_{h=1}^{L} N_h \sigma_h^2}{N\sigma^2} \quad (8)$$

In the above formula, L represents the variable stratification, that is, classification or partition; N_h and N represent the number of units in layer h and the entire area, respectively; σ_h^2 and σ^2 represent the variance of the result variable in layer h and the entire area, respectively; and q represents a certain front. The magnitude of influence of the dependent variable on the outcome variable is in the range of [0, 1]. The closer q is to 1, the greater the explanatory strength of the pre-dependent variable on the outcome variable. Conversely, the closer q is to 0, the smaller the explanatory strength. This study uses the geographic detector method to identify the factors affecting the spatial distribution of sports tourism resources in China.

The purpose of interaction detection is to assess whether the explanatory power of the spatial differentiation of China's sports tourism resources increases or decreases when two factors are working together. The evaluation method is to judge the direction and method of interaction between factors by comparing the values of the single and double factors of q, which can generally be divided into five categories [21]: (1) nonlinear weakening Q < Min(q(X1),q(X2)); (2) single-factor nonlinear weakening Min(q(X1),q(X2)) < Q < Max(q(X1),q(X2)); (3) two-factor enhancement Q > Max(q(X1),q(X2)); (4) independent Q = X; and (5) nonlinear enhancement Q > X, where Q = q(X1)∩q(X2), X = q(X1) + q(X2). Among them, Q = q(X1)∩q(X2), X = q(X1) + q(X2), where q(X1) and q(X2) are the influencing factors of the spatial differentiation of sports tourism resources in China. Both Chi et al. [22] and Zhang et al. [17] used Geodetector to study the similarity between the independent variable and the dependent variable in the spatial distribution to understand whether different influencing factors have an interactive effect on the spatial distribution.

2.2. Index Selection

This study integrates the particularity of China's sports tourism resources in its development and follows the relevant principles of scientific, representativeness, operability, reliability, and availability in the selection of indicators. The structure of factors affecting the spatial distribution of sports tourism resources is described in view of the wuli–shili–renli (WSR) methodology, a system theory with Eastern philosophy. The basic core of its philosophy and concept is to consider not only the aspects of objects, but also their better applications to material aspects when dealing with complex issues [23]. Given that sports tourism contains many complex components of people and things, involving their composition and relationships, we learn from previous studies and apply the WSR to multidimensional analysis [24]. WSR methodology was proposed by Gu and Zhu. It is not only a methodology, but also a framework tool for solving complex problems. The connection between wuli, shili, and renli is the coordination of the relationship between intention, goal, reality, strategy, plan, and conception, which can coordinate the relationship between input, output, and outcome of system practice [25].

The quantity of sports tourism resources is taken as the dependent variable. At the same time, we construct a model that can explore the main influencing factors of the spatial distribution of sports tourism resources in China. Variables are selected from natural resource endowment, sports resource endowment, hardware and software services,

transportation capacity, people's living standards, industrial support and guidance, economic benefit effects, and market cultivation and development, as shown in Figure 1. The four factors of natural resource endowment, sports resource endowment, software and hardware services, and transportation capacity provide conditions for the occurrence of sports tourism activities and also restrict the scale and efficiency of internal operations. They are the internal motivation of sports tourism activities and are at the core, which is in line with the physical dimension of the understanding of the objective world, belonging to the physical dimension. People's living standards, industrial support, and guidance are external influencing factors that provide power for the demand market of the sports tourism industry. They are the prerequisite and foundation for the smooth operation of the industry, which is consistent with shili dimension's response to events. Therefore, the two factors belong to shili dimension. The two factors of economic benefit effects and market cultivation and development are internal factors. They act on the people's sports tourism practice and open up the sports tourism market, which can promote the improvement and effect of external influencing factors. In line with renli dimension's understanding of the actual effects of the incident, they belong to the renli dimension.

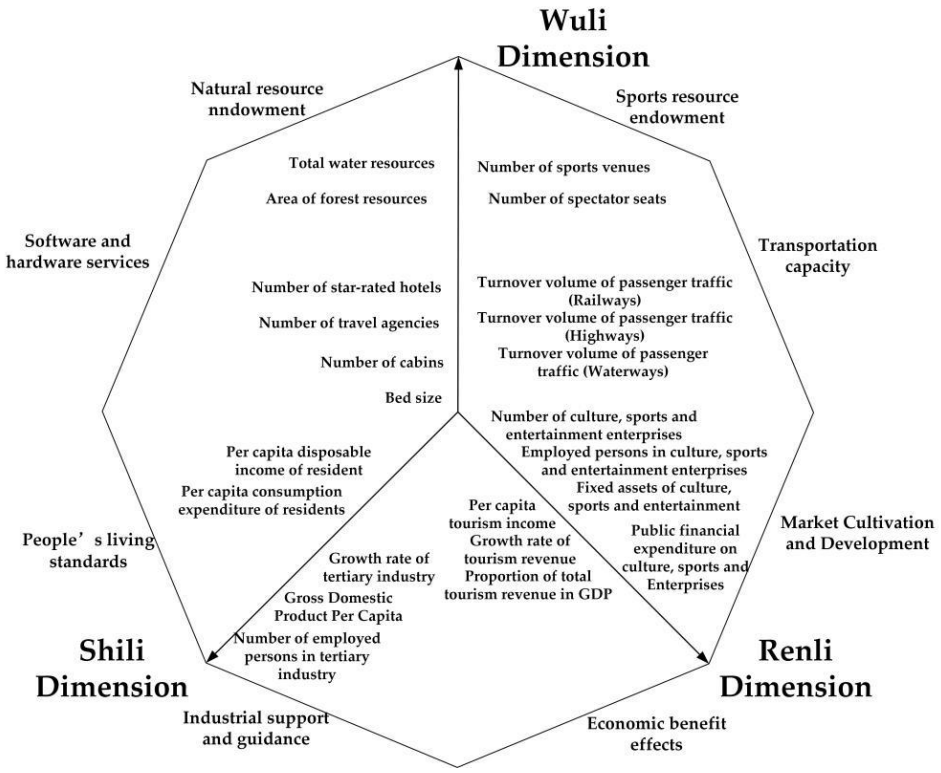

Figure 1. Impact analysis framework of the spatial distribution of sports tourism resources in China.

As shown in Table 1, the choice of variables is built on the following assumptions:

(1) Natural resource endowment is the major source of demand for the development of sports tourism resources, which primarily include those of water and forests. The richer the natural tourism resources, the better the development of sports tourism [26].
(2) Sports resource endowment can effectively increase the number of sports events, which has a positive promotion for sports tourism development [7].
(3) The construction and improvement of software and hardware services are a very critical foundation link for the progress and utilization of sports resources. Improving and supporting software and hardware services can create a good tourism service environment, thereby effectively enhancing the development of sports tourism [26].

(4) Transportation capacity is one of the important factors for tourists when choosing a destination, and thus the convenience and accessibility of transportation also serve as significant references for the development of tourism resources [27].
(5) People's consumption has shifted from "subsistence" to "well-off" type. The consumption structure is continuously optimized and upgraded. Meanwhile, sports consumption is moving towards the "participatory and entertainment" type, with sports and recreative tourism as precisely its representative. Therefore, the higher the consumption of residents, the richer the corresponding sports tourism resources [28].
(6) Sports tourism belongs to the tertiary industry, which has a faster growth rate. As the apparent effect of industrial support and guidance increases, the integrated development of sports, culture, tourism, and other industries increases in quality [29].
(7) The economic benefit effect can raise employee wages, stimulating greater resources to invest in the tourism industry. Thus, this factor can positively promote the development of sports tourism [2].
(8) Market cultivation and development can facilitate the convergence of sports and tourism. Thus, expanding the share of sports investment and increasing the level of sports consumption becomes possible. On this basis, market cultivation and development can provide basic support for the development of sports tourism [30].

Table 1. Index selection of factors affecting sports tourism resources in China.

System Framework	First-Level Index	Second-Level Index	Unit of Account	Weighting Target
Wuli Dimension	Natural resource endowment	Total water resources	billion m^3	0.055
		Area of forest resources	10,000 hectares	0.055
	Sports resource endowment	Number of sports venues	Pcs	0.041
		Number of spectator seats	unit	0.071
	Software and hardware services	Number of star-rated hotels	unit	0.039
		Number of travel agencies	unit	0.042
		Number of cabins	room	0.037
		Bed size	bed	0.040
	Transportation capacity	Turnover volume of passenger traffic (railways)	10,000 persons	0.044
		Turnover volume of passenger traffic (highways)	10,000 persons	0.042
		Turnover volume of passenger traffic (waterways)	10,000 persons	0.073
Shili Dimension	People's living standards	Per capita disposable income of residents	CNY	0.038
		Per capita consumption expenditure of residents	CNY	0.035
	Industrial support and guidance	Growth rate of tertiary industry	%	0.043
		Gross domestic product per capita	CNY	0.030
		Number of employed persons in tertiary industry	CNY 10,000/person	0.043
Renli Dimension	Economic benefit effects	Per capita tourism income	CNY 10,000/person	0.035
		Growth rate of tourism revenue	%	0.032
		Proportion of total tourism revenue in GDP	%	0.037
	Market cultivation and development	Number of culture, sports, and entertainment enterprises	unit	0.043
		Employed persons in culture, sports, and entertainment enterprises	10,000 persons	0.041
		Fixed assets of culture, sports, and entertainment	CNY 100 million	0.047
		Public financial expenditure on culture, sports, and Enterprises	CNY 100 million	0.037

2.3. Data Sources

The data of sports tourism resources came from the recommended list of "China Sports Tourism Boutique Projects" (only the finalists) announced by the General Administration of Sports. In order to promote reasonable regional planning of sports tourism and accelerate the efficiency of sports tourism in releasing new economic kinetic energy, the Chinese government began to cultivate sports tourism boutique projects in 2013. Sports tourism boutique projects are operational tourist attractions, scenic spots, routes, events, festivals, and other projects that are reported by provinces, municipalities, autonomous regions, and municipalities directly under the Central Government and selected by expert appraisal teams. They are based on the market and centered on the sports needs of tourists. Besides, they are supposed to provide tourists with a certain degree of participation and viewing value. Statistics from 2013 to 2018 show a total of 755 sports tourism boutique projects. Supplementary data were found in the China Statistics Bureau, provincial (cities, districts) tourism development statistical bulletins, local tourism industry bulletins, and "China Sports Tourism Boutique Project Development Report". Repeated declarations were screened. The number of sports tourism boutique projects was 209 in 2014 and 590 in 2018. Sampling was based on the venue for boutique events, coordinates of the visitor center for boutique scenic spots, government location for boutique destinations, and starting point locations for the boutique route.

Considering the consistency of the statistical caliber of relevant indicators involved in sports tourism, data from 31 provinces in China (excluding Hong Kong, Macao, and Taiwan) in 2018 were selected for analysis. The data were mostly derived from the 2018 China Statistical Yearbook, China Tourism Statistical Yearbook, and China Mass Sports Development Report. Several indicators were supplemented by data from local statistical yearbooks, statistical bulletins of the local sports bureaus, and the official website of the Ministry of Finance of China. In addition, the maps of China were all obtained from the Resource and Environmental Science Data Center of the Chinese Academy of Sciences (http://www.resdc.cn/Default.aspx, accessed on 12 May 2021).

3. Results

3.1. Pattern of Sports Tourism Resources in 2014

Figure 2 shows that the distribution level of sports tourism resources of the 31 provincial research units in China can be classified as tentative (cumulative ratio = 0%), low (cumulative ratio 0–6%), medium (cumulative ratio 6–44%), or high (cumulative ratio 44–100%). Specifically, Beijing, Hunan, Liaoning, Ningxia, Sichuan, Tianjin, Yunnan, Chongqing, Jilin, and other places do not have shortlisted sports tourism boutique projects in 2013 and 2014 and are considered blank areas. Jiangxi, Tibet, Guangdong, Zhejiang, Shanghai, and Xinjiang account for 6% of the national sports tourism resources, representing areas with low development levels. Guangxi, Heilongjiang, Hainan, Shaanxi, Fujian, Gansu, Henan, Shanxi, Qinghai, Hebei, and other provinces account for 38% of the national sports tourism resources, belonging to the middle-level development area. Shandong, Jiangsu, Inner Mongolia, Hubei, Guizhou, and Anhui account for 56% of the national sports tourism resources, belonging to the high-level development area.

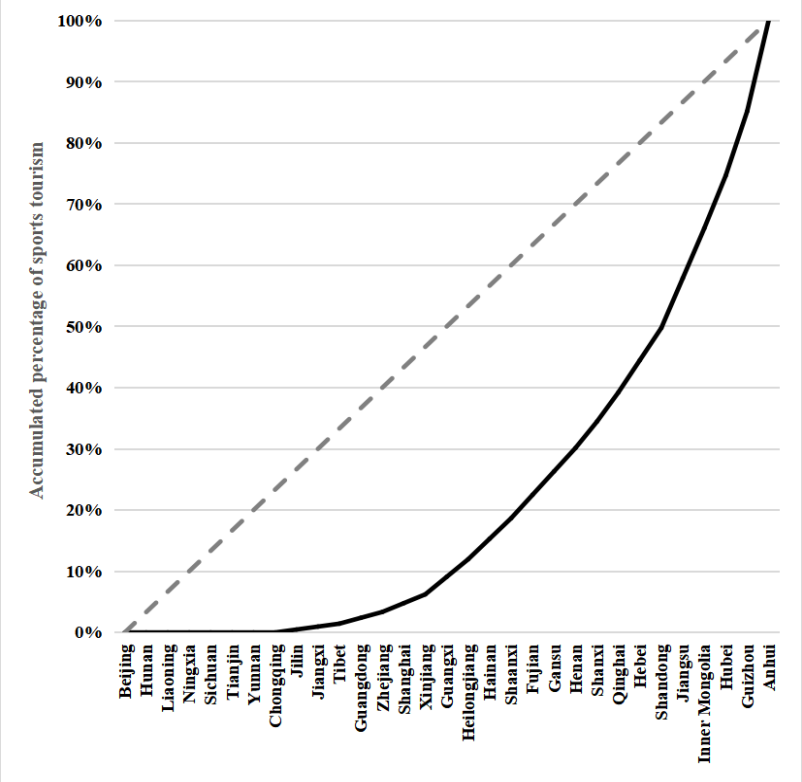

Figure 2. Lorentz curve of the distribution of China's sports tourism resources in 2014.

This study used ArcGIS 10.2 software (ESRI, Inc., Redlands, CA, USA) and average nearest neighbor to analyze China's sports tourism resources in 2014. The results are as follows: average observation distance is 62,725.6701 m, expected average distance is 133,750.1520 m, nearest neighbor ratio R is 0.468976, Z is −14.686483, and the significance level is $p < 0.001$, indicating that China's sports tourism resources in 2014 showed a clear agglomeration distribution in space.

The spatial agglomeration characteristics of sports tourism resources are discussed through nuclear density mapping. Figure 3 shows that before 2014, China's sports tourism resources displayed the Yangtze River Delta city cluster as the high-density core area, while the Guizhou–Guangxi border and the western Hubei ecological circle are the secondary density core area. Moreover, China's sports tourism resources have a distribution trend of "depending on the city, near the scenery", which means forming a central city based on the surrounding scenery. Central diffusion gradually forms an axial zone, which superimposes with the central radiation and coexists to form a network surface [6]. Moreover, the spatial characteristics reveal large concentration and small dispersion, that is, mainly concentrated in urban agglomerations and areas with high natural resource endowments, and a small amount scattered in areas with less traffic access but with unique natural resources. The possible reasons are, on the one hand, the sports tourism industry in the Yangtze River Delta urban agglomeration has a good foundation and clear location advantages. On the other hand, the levels of per capita disposable income and per capita consumption expenditure are much higher than those of other regions in the country. As a result, consumption demand is continuously driven and the supply side structure is continuously optimized. The market of sports tourism is vast, leading the country in terms of development [31]. The Guizhou–Guangxi border area and western Hubei ecological circle have superior natural environmental conditions, both of which are karst geomorphic regions. The natural scenery is the development feature. The precious resource of sports tourism is an ideal place to carry out exciting and entertaining activities such as rock climbing and bungee jumping [32]. Urban agglomerations and areas with high natural resource endowments have attracted a large number of sports tourism resources due to their

superior geographical location, sound infrastructure, convenient transportation routes, and industrial policy support and guidance. Zones with poor transportation access but with unique natural resources because of their different tourist experiences can still attract the layout of sports tourism.

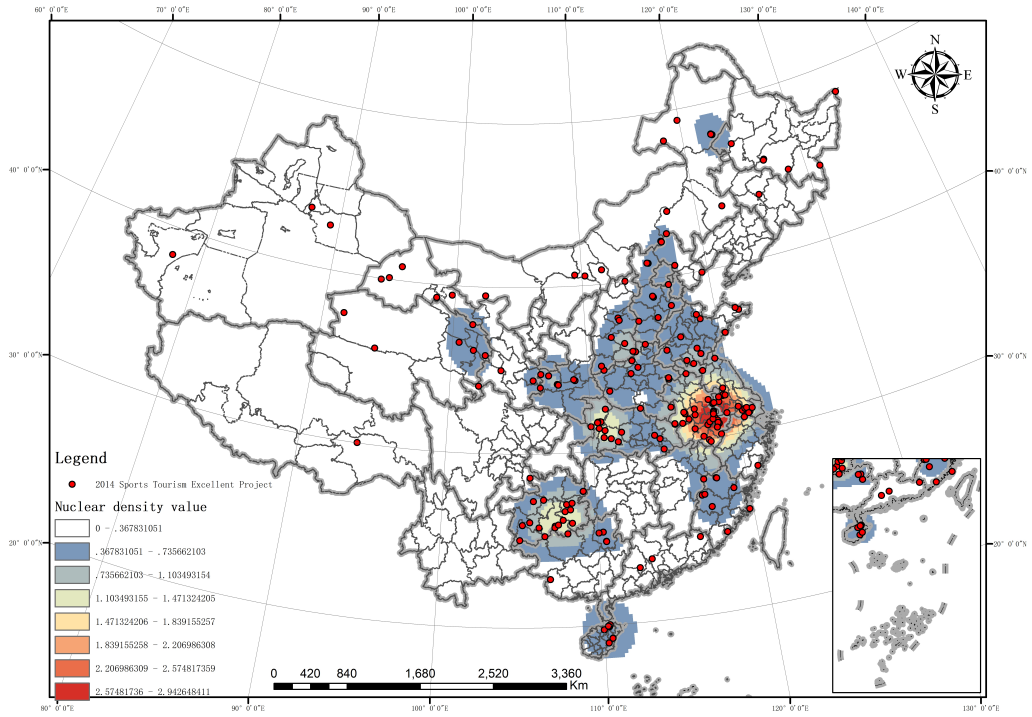

Figure 3. Distribution of core density of China's sports tourism resources in 2014. The color in the figure changes from gray to red: the redder the color, the more clustered the sports tourism projects. See the nuclear density index as shown in the legend for details.

By using global spatial autocorrelation technology, the spatial characteristics and aggregation effects of China's sports tourism resources were further explored. Adopting ArcGIS 10.2, the global Moran's I index was calculated to obtain the global autocorrelation of China's sports tourism resources. Global Moran's I is −0.0084, Z(I) is 0.2503, and P(I) is 0.376, illustrating that the national provincial sports tourism resources do not have significant spatial agglomeration trends. The amount of sports tourism resources in each province is not related to those in surrounding provinces. Above all, the effect of "neighboring dependence" has not been formed, which is not conducive to sports tourism development in the entire region.

3.2. Pattern of Sports Tourism Resources in 2018

From 2014 to 2018, China's sports tourism boutique projects increased by 381, with an average annual increase of 127. Most provinces have a certain degree of growth. Jiangsu, Qinghai, Yunnan, Gansu, Shanxi, Anhui, Guizhou, and Hubei all have over 30 new projects, with a rapid growth trend. Comparing the Lorentz curves of the distributions of sports tourism resources in each province in the two years (Figures 2 and 4), it can be seen that the regional differences tend to converge. The division of the resource distribution in 31 provincial research units across the country also changed into tentative (cumulative ratio = 0%), low (cumulative ratio 0–17%), medium (cumulative ratio 17–46%), and high (cumulative ratio 46–100%). In particular, from 2015 to 2018, no sports tourism boutique projects were shortlisted in Beijing, Hunan, Chongqing, and other places, which are temporarily depicted as blank areas. Sichuan, Tibet, Guangdong, Jilin, Hainan, Ningxia, Tianjin, Shanxi, Shanghai, Liaoning, Jiangxi, Zhejiang, and other provinces account for 17% of the national sports tourism resources and are areas with low development levels. Henan, Shandong,

Heilongjiang, Guangxi, Xinjiang, Hebei, Fujian, and Inner Mongolia account for 17% of the national sports tourism resources. Regions with medium development levels account for 29%. Yunnan, Hubei, Gansu, Shanxi, Jiangsu, Anhui, Guizhou, and Qinghai account for 54% of the national sports tourism resources and are regions with high development levels. Yunnan, Gansu, Shanxi, and Qinghai have risen from the previous blank, medium, and low to high development levels. Xinjiang has risen from a previous low development level to a medium development level, and Liaoning, Ningxia, Sichuan, Tianjin, and Jilin have risen from the previous blank development level to a low level of development. However, Shandong, Hainan, Shaanxi, and Inner Mongolia have been downgraded.

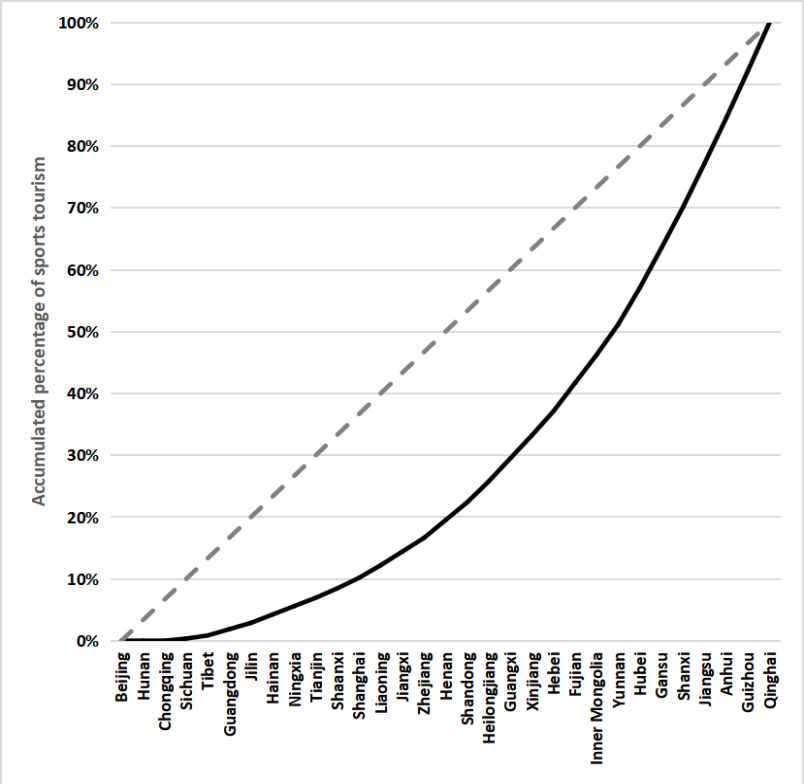

Figure 4. Lorentz curve of the distribution of China's sports tourism resources by province in 2018.

ArcGIS 10.2 (ESRI, Inc., Redlands, CA, USA) was applied to analyze the average nearest neighbors of China's sports tourism resources in 2018. Results show that the average observation distance is 33,333.9247 m, expected average distance is 82,961.2671 m, the nearest neighbor ratio R is 0.401801, Z score is −27.797295, and the significance level is $p < 0.001$. Thus, China's sports tourism resources in 2018 show a clear agglomeration distribution in space.

As shown in Figure 5. Compared with the results of 2014, while the Yangtze River Delta urban agglomeration remains a high-density core area, the secondary density core areas are now the Yunqian border area of the Karst Plateau, Qinglong border area of the Qilian Mountains, and the Jinji border area of the Taihang Mountains. Nonetheless, the distribution trait is also "depending on the city, near the scenery" and "large concentration, small dispersion". By contrast, the location of the core area of the Yangtze River Delta urban agglomeration has no significant change in 2018, but the sub-density core area extends to the northwest toward the Qinglong border area of the Qilian Mountains and to the southwest towards the Yunqiangui border area of the Karst Plateau. The core area of the western Hubei ecosphere is transformed into the Taihangshan Jinji border area. The possible reason is mainly that the Yangtze River Delta urban agglomeration has the highest level of economic development and the highest residents' living standards in China. The sports tourism market and industrial chain in this area are more mature than in

other regions. Moreover, the development and investment prospects of the sports tourism market are broad. Numerous ethnic minorities reside near the Yunnan–Guizhou Plateau, and their habitats, geomorphology, and climatic conditions are special. The surrounding environment is beautiful and scenic, thus ushering in the explosive period of sports tourism development [33]. Qilian Mountain Qinglongbian District is situated in the golden section of the Silk Road Economic Belt. Rich in geography, water, biological resources, cultural relics, folk customs, sports competitions, and other resources, the area is suitable for the development of sports tourism projects. The relevant resources in the core area have gradually changed from "dispersed" to "intensive" [34]. Natural beauty, historical civilization, and revolutionary historical sites together constitute the unique sports tourism resources Jinji border area of the Taihang Mountains. Relying on the complex and changeable geology, geomorphology, hydrology, and meteorology, as well as a long history and a heavy and ancient sports culture, this area can provide the foundation and guarantee for the development of sports tourism in the Shanxi–Hebei border area of the Taihang Mountains [35].

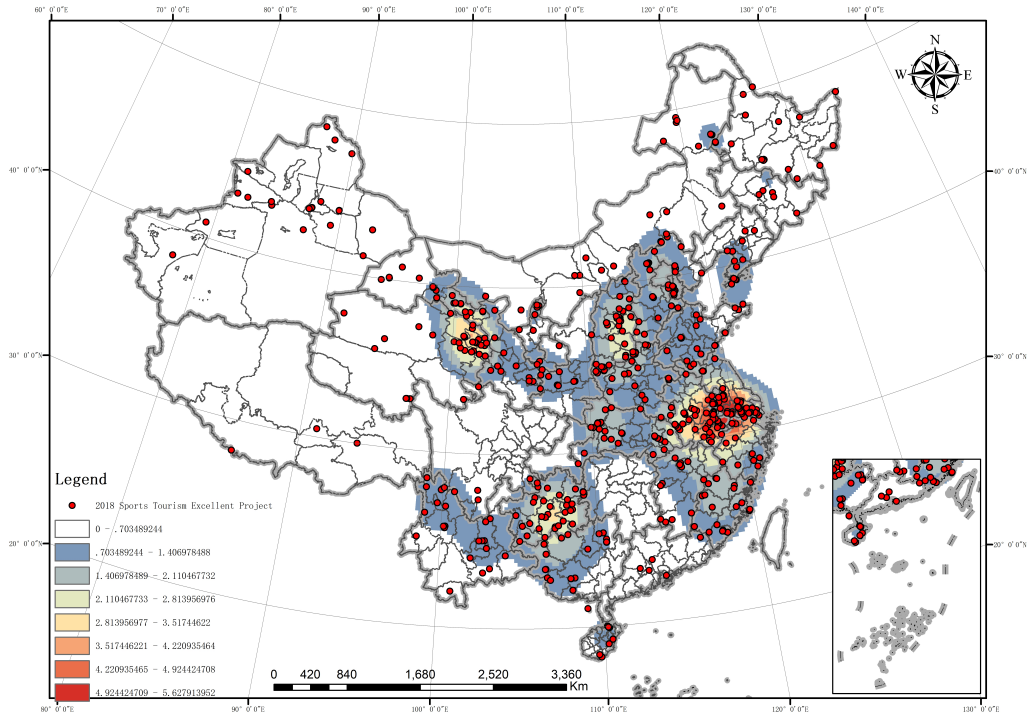

Figure 5. Distribution of core density of China's sports tourism resources in 2018. The color in the figure changes from gray to red: the redder the color, the more clustered the sports tourism projects. See the nuclear density index as shown in the legend for details.

Using ArcGIS 10.2 to calculate the global Moran's I index, global Moran's I is −0.0897, Z(I) is −0.4782, and P(I) is 0.325, demonstrating that no remarkable spatial aggregation trend occurred for sports tourism resources at the provincial level across China in 2018.

As a further exploration, the amount of sports tourism resources in each province was superimposed with the growth rate. These two factors were divided into six development stages using the coupling and coordination model [36]. Figure 6 shows that the provinces coordinating the development of sports tourism account for 61.29%. Fewer provinces exhibit extreme incoordination, namely Chongqing, Hunan, Beijing, and Sichuan. Several provinces are between basic incoordination (Shandong, Ningxia, Jilin Province, Zhejiang) and primary coordination (Hainan, Shanghai, Liaoning, Hebei). The main reason for the above situation is that the development of sports tourism has attracted much attention in recent years. Both the sports and tourism industries are strongly advocating sports tourism, and China has promulgated various policies that are conducive to this develop-

ment. In addition, marathon events and sports hardware facilities in scenic spots have been implemented as its foundation. As such, the coordination stage of sports tourism development in the eastern region is far ahead, which is evidently higher than the national average. The northeast, northwest, and parts of the southwest are at the same level as the national average, which is stable and gradually becoming more coordinated. Sichuan, Chongqing, Hunan, Guangdong, Shaanxi, and other places still have a large room for improvement.

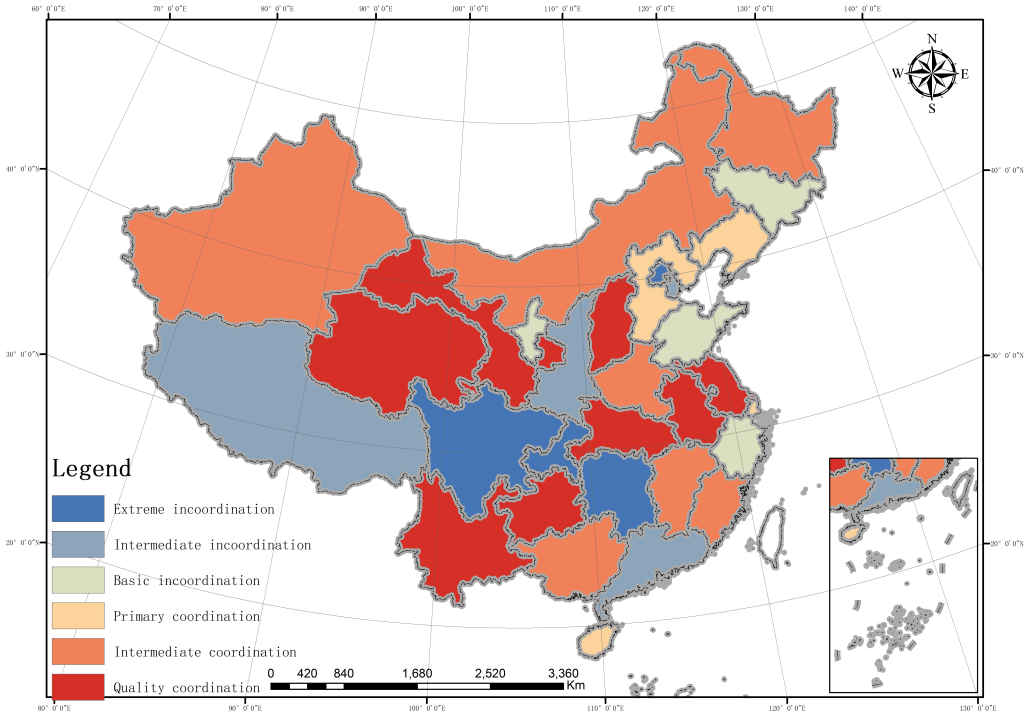

Figure 6. Level of coordination of sports tourism in various provinces in China. The color in the picture changes from blue to red: the redder the color, the more coordinated the development of sports tourism. See the legend for details.

3.3. Factors Influencing the Spatial Distribution of Sports Tourism Resources

3.3.1. Influencing Factors of the Spatial Distribution of Sports Tourism Resources

The geographic detector model was used to explore the essential mechanism of the differences in the spatial distribution of sports tourism resources in China to seek a more scientifically specific optimization path for regional sports tourism development planning. The rapid cluster analysis method in SPSS 24.0 (SPSS Inc., Chicago, IL, USA, 2019) was used to classify the driving factors, such as natural resource endowments, sports resource endowments, software and hardware services, transportation capacity, people's living standards, industry support and guidance, economic benefit effect, and market cultivation and development into five categories from high to low. Then, the geographic detector analysis was carried out to calculate the q value of each driving factor on the spatial distribution of China's sports tourism resources. Table 2 shows the results.

In Table 2, the q value means the extent to which the detection factor explains and affects the spatial distribution of China's sports tourism resources. The larger the q value, the greater the impact of the factor [22]. In general, among the identified eight driving factors, the order of descending impact on the spatial distribution of China's sports tourism resources is as follows: natural resource endowment > sports resource endowment > transportation capacity > industrial support and guidance > market cultivation and development > people's living standards > software and hardware services > economic benefit effect. The principal factors are natural resource endowment, sports resource en-

dowment, transportation capacity, industry support and guidance, and market cultivation and development.

Table 2. Detection results of factors affecting the spatial distribution of sports tourism resources in China.

Driving Factor	q-Statistic	Detection Index	q-Statistic
Natural	0.308	Total water resources	0.300
		Area of forest resources	0.122
Sport	0.219	Number of sports venues	0.116
		Number of spectator seats	0.096
Service	0.094	Number of star-rated hotels	0.225
		Number of travel agencies	0.084
		Number of cabins	0.137
		Bed size	0.278
Transportation	0.172	Turnover volume of passenger traffic (railways)	0.120
		Turnover volume of passenger traffic (highways)	0.309
		Turnover volume of passenger traffic (waterways)	0.078
Living	0.103	Per capita disposable income of residents	0.177
		Per capita consumption expenditure of residents	0.175
Industrial	0.170	Growth rate of tertiary industry	0.206
		Gross domestic product (GDP) per capita	0.200
		Number of employees in the tertiary industry	0.383
Economic	0.079	Per capita tourism income	0.122
		Growth rate of tourism revenue	0.185
		Proportion of total tourism revenue in GDP	0.146
Market	0.136	Number of culture, sports, and entertainment enterprises	0.392
		Employees in culture, sports, and entertainment enterprises	0.167
		Fixed assets of culture, sports, and entertainment	0.233
		Public financial expenditure on culture, sports, and enterprises	0.282

Significance level, $p < 0.05$.

The details are as follows:

(1) Natural resource endowment, with its explanatory power of 0.308, has a huge impact on the spatial distribution of China's sports tourism resources. In practice, the development of sports tourism resources is conducted in consideration of local conditions, several of which are related to natural resources. Others are based on the characteristics of geo-sports, such as the use of climbing, bungee jumping, surfing, and other activities close to the development of natural resources [26]. Given the abundance of natural resources, the requirements for other essential resources are relatively low.

(2) The explanatory power of the endowment of sports resources is in the second position with a value of 0.3379. Sports tourism often takes sports fitness and leisure projects, sports events, large-scale stadiums, and other relevant resources as the core attractions to provide conditions for tourist services. These include sports fitness venues and well-known landmark sports buildings (museums) [7].

(3) The explanatory power of transportation capacity is 0.172, ranking third. Given the scattered sports tourism resources in several areas, the accessibility and convenience of transportation affect the interest of tourists. Often, destinations with better traffic conditions naturally have more tourists. In recent years, national road transportation has shown continuous growth. Counting on the opportunities of global sports tourism, the construction pattern of national boutique sports tourism routes is gradually taking shape, effectively enhancing the spatial spillover effect of sports tourism resources [2].

(4) Industry support guidance has an explanatory power of 0.170, ranking fourth. Sports tourism is directly related to the tertiary industry in the region and affects the regional GDP. As a labor-intensive and service industry, sports tourism needs to satisfy tourists' food, housing, transportation, travel, shopping, and entertainment needs. These various demands have driven the evolution of related industries and provided more job opportunities [29].

(5) The explanatory power of market cultivation and development is 0.136, ranking fifth. Government and institutions guide large strategic investors to adjust the investment structure, fully mobilize the enthusiasm of market entities, strengthen talent training, and promote capital flow, which contributes to the sustainable development of sports tourism [2].
(6) In contrast to the above influencing factors, people's living standards, software and hardware services, and economic benefit effects are weaker in explaining the differences in the spatial distribution of sports tourism resources in China. These factors have an apparent negative impact but an unclear positive effect.

3.3.2. Analysis of Detection Factor Interaction Results

Interaction was used to reveal whether an interactive relationship exists among the abovementioned influencing factors. In Table 3, the results show that the explanatory power of different two-factor interactions is higher than that of single-factor interactions. Meanwhile, the interaction types presented are nonlinear and two-factor enhancements. Specifically, the explanatory powers after Living∩Market, Living∩Industrial, Natural∩Sport, Natural∩Living, and Service∩Living are in the top five of all interaction factors. The biggest differences in explanatory power before and after the interaction are those of Living∩Market, Service∩Living, and Living∩Industrial. The reasons are clear. First, the improvement of people's living standards has greatly satisfied their material needs, allowing people to place greater emphasis on the pursuit of spiritual life. Sports tourism can relax tourists and achieve the purpose of physical and mental pleasure, which can satisfy people's pursuit of spiritual life. Second, the sports tourism industry has gradually increased in importance in the development of China's National Economic Law, which can effectively promote progress in related industries. The sustainable development of sports tourism is inseparable from natural resources, sports resources, and software and hardware services. Consequently, the comprehensive interaction of the above factors can significantly affect the spatial distribution of sports tourism resources. For example, located in the core area of tourism, Anhui has certain advantages in natural resources, transportation, economic benefits, and market cultivation and development. With the relative balance of all influencing factors, sports tourism development in Anhui is comparatively high. In similar situations are Guizhou, Qinghai, Gansu, Shanxi, Inner Mongolia, Yunnan, and Fujian provinces.

Nevertheless, Tibet, Ningxia, and Liaoning, which are the cold spots of sports tourism, are relatively backward in natural resources, sports resources, hardware and software services, transportation capacity, people's living standards, economic benefits, and market cultivation and development. In addition, the levels of these influencing factors show spatial unevenness. However, the above provinces have great potential for improvement, which illustrates that the future development of sports tourism should give full play to the advantages of natural and sports resources and carry out good planning and layout. Making full use of financial support and counting on the tourism public service platform gradually improves the sports tourism service system. Reinforcing the connection and extension of expressways and ordinary roads in remote areas is encouraged to provide better transportation services for tourism. Subsequently, accelerating the development of the tertiary industry to optimize the province's tourism market structure is also a fantastic way to create a distinctive sports tourism brand, which can lead to economic gains and promote related industries through internal penetration, extension, and expansion of the industry.

Table 3. Interaction results and types of detection factors.

	Q	*X*	Interaction Type		*Q*	*X*	Interaction Type
Natural∩*Sport*	0.650	0.527	non-E	*Service*∩*Living*	0.606	0.197	non-E
Natural∩*Service*	0.545	0.402	non-E	*Service*∩*Industrial*	0.306	0.264	bi-E
Natural∩*Transportation*	0.605	0.480	non-E	*Service*∩*Economic*	0.481	0.173	non-E
Natural∩*Living*	0.606	0.411	non-E	*Service*∩*Market*	0.185	0.230	bi-E
Natural∩*Industrial*	0.519	0.478	bi-E	*Transportation*∩*Living*	0.442	0.274	non-E
Natural∩*Economic*	0.448	0.387	bi-E	*Transportation*∩*Industrial*	0.574	0.342	non-E
Natural∩*Market*	0.601	0.444	non-E	*Transportation*∩*Economic*	0.441	0.251	non-E
Sport∩*Service*	0.350	0.313	bi-E	*Transportation*∩*Market*	0.545	0.308	non-E
Sport∩*Transportation*	0.381	0.391	bi-E	*Living*∩*Industrial*	0.667	0.273	non-E
Sport∩*Living*	0.449	0.322	non-E	*Living*∩*Economic*	0.333	0.182	non-E
Sport∩*Industrial*	0.383	0.389	bi-E	*Living*∩*Market*	0.736	0.239	non-E
Sport∩*Economic*	0.436	0.298	non-E	*Industrial*∩*Economic*	0.506	0.249	non-E
Sport∩*Market*	0.344	0.355	bi-E	*Industrial*∩*Market*	0.325	0.306	bi-E
Service∩*Transportation*	0.420	0.266	non-E	*Economic*∩*Market*	0.458	0.215	non-E

Significance level, $p < 0.05$; non-E denotes nonlinear enhanced while bi-E denotes bivariate enhanced.

4. Conclusions

This study comprehensively implemented a combination of the average nearest neighbor, kernel density, and spatial autocorrelation to explore the spatial distribution of 209 and 590 sports tourism boutique projects in 2014 and 2018, respectively. Their influencing factors were determined by combining the entropy method and the geographic probe model. The major takeaways from this study are as follows:

(1) Before 2014, China's sports tourism resources show that the Yangtze River Delta urban agglomeration is the high-density core area. The Guizhou–Guangxi border area and the western Hubei ecological circle are the sub-density core areas, where the spatial distribution shows obvious agglomeration. The effect of "proximity dependence" between them has not been formed. The distribution of sports tourism resources in the 31 provincial research units across the country can be divided into four stages.

(2) From 2014 to 2018, the number of China's sports tourism boutique projects increased by 381, with an average annual increase of 127. The regional differences in sports tourism resources in each province tended to converge. In 2018, the urban agglomerations in the Yangtze River Delta are still high-density core areas. However, different from 2014, the sub-density core areas are now the Yunqian border area of the Karst Plateau, the Qinglong border area of the Qilian Mountains, and the Jinji border area of the Taihang Mountains. These areas form the shape of "depending on the city, near the scenery" and "large concentration, small dispersion" and have a clear agglomeration distribution. The effect of "neighboring dependence" has not been formed and is only starting among the provinces.

(3) Through the coupling and coordination model, the quantity and growth rate of provincial sports tourism resources can be divided into 10 stages. In terms of provincial sports tourism development, 61.29% of provinces are in the coordinated stage. The coordination level of the eastern region is far ahead and significantly higher than the national average. The coordination levels of the northeast, northwest, and parts of the southwest are equal to the national average along with stable development and tendency for coordination. Meanwhile, Sichuan, Chongqing, Hunan, Guangdong, Shaanxi, and other places still have considerable space for progress.

(4) The influencing factors on the spatial distribution of sports tourism resources show significant variations. The descending order of influence is natural resource endowment > sports resource endowment > transportation capacity > industry support and guidance > market cultivation and development > people's living standards > software and hardware service supporting > economic benefit effect. Moreover, the explanatory power of different two-factor interactions is higher than that of single-factor interactions. The interaction types presented are nonlinear and two-factor enhancements.

5. Discussion

The analysis above shows that China's sports tourism resources present an obvious agglomeration distribution. In their research, Fugao and Li proposed that the development of regional sports tourism has gone through four stages: point symbiosis at the core node of sports tourism, intermittent symbiosis of sports tourism short chain, continuous symbiosis of sports tourism industry chain, and integrated symbiosis of sports tourism industry network. The stages embody the generation and evolution process of the spatial structure of "point–line–surface–domain" [6]. As seen from the results of this study, the spatial distribution of China's sports tourism resources can indeed reflect the spatial structure of "point–line–surface–domain". The polarization of "spots" is the embryonic stage of sports tourism. Research has found that sports tourism tends to gather in the "spots" that are more developed. The development form is mainly spontaneous, and the spatial form is mainly scattered. The findings of this article are similar to those of Zuo et al. Both the development of sports tourism and the marathon events have emerged in economically developed areas and spread to surrounding areas. For example, they originated from Beijing, Shanghai, and so on, and then spread to Beijing–Tianjin–Hebei region and the Yangtze River Delta.

The analysis also indicates that natural resource endowments and sports resource endowments are the most important factors affecting the spatial distribution of sports tourism in China. It is worth noting that this viewpoint is supported by Kurtzman et al. and Zuo et al. They believe that natural resource endowment is the main source of demand for the development of sports tourism resources. The richer the natural tourism resources, the better the development of sports tourism [26]. The holding of sports events often also promotes the development of the sports tourism industry [7].

As mountain biking, skiing, rock climbing, sailing, swimming, and other sports activities often occur in natural settings such as rivers, mountains, skiing, forests, lakes, seashores, hot springs, grasslands, and other places, the natural resources of tourist destinations are the key attraction for tourists [11]. Besides, our findings are similar to those of Kurtzman and Zauhar, who found that sports events can attract a large number of spectators to participate in tourism [37]. In particular, the sports boutique events attract a large number of sports enthusiasts every year. Among them, the more influential and representative events include the upcoming Beijing Winter Olympics and the Paralympics, as well as a series of international marathons [7]. At present, a large number of studies have shown that transportation capacity restricts the development of tourism. According to our research results, the development of sports tourism is also affected by transportation. The completeness of transportation corridors and other carriers can effectively promote the development of sports tourism activities. Yang et al. believe that the pivotal factor for the sustainable development of sports tourism lies in mass transit planning. Traffic problems often have a great negative impact on sports tourism, while sustainable mass transit planning can reduce the risk of traffic problems [38].

In allusion to the assessment of the spatial distribution pattern and influencing factors of sports tourism resources in China, the following proposals are put forward:

First, the development of sports tourism resources is concerned with local conditions. It is necessary to consider the advantages of local natural resources in combination with the selection of a sports ontology resource as the core attraction. With the help of highlighting unique characteristics, it becomes possible to create fine products and lift the matching degree of local tourism resources and sports tourism. Notably, emphasis on the importance of resources in a region is vital to the development of its sports tourism. Thus, the so-called unique sports events must rely on natural or sports resources with local characteristics. To develop these unique projects, localities must first clarify their own resource advantages. However, the current actual situation is that such natural resources are insufficient without a deep understanding that the core of the sports tourism industry is composed of natural and sports resources. Although the existing abundant sports resources can support the tourism industry for a period of time, creating a unique brand is not sustainable and even difficult. Hence, establishing a concept of "creating a solid basic resource environment" is indispensable. At this time, nature and sports resources may be coordinated to promote the development of the sports tourism industry. A single type of resource should not be overexploited to further develop surrounding sports projects and corresponding industries.

Second, with the opportunity of region-wide sports tourism, the connection and extension of expressways and ordinary roads in remote areas can be improved. This will not only strengthen the construction of tourist passages in border areas, but also elevate the traffic capacity inside and in neighboring provinces. Simultaneously, accelerating the connection of sports characteristic towns and sports tourism may be safely carried out. The construction of high-quality projects and the national sports tourism demonstration base for dedicated roads can expand the radiation range of popular scenic spots and provide better transportation services. In the core areas, consideration of dependence on excellent tourist cities and 5A-level scenic spots can unite sports tourism resources. For evacuation areas, greater attention is needed on the link function of roads, and emphasis should be placed on integrating sports tourism resources in eco-tourism to adapt to the demands of self-driving groups.

Finally, stronger guidance is necessary for local industries to meet the needs of tourists for food, housing, transportation, travel, shopping, entertainment, and other aspects of sports tourism to promote the development of related industries. As a result, more employment opportunities become available for more people, which generates a virtuous circle. According to the local living standards, everything can be carried out within capabilities and invested appropriately. To strengthen cooperation and sharing with the surrounding sports industry market, the government has to increase public financial expenditures for sports and introduce large-scale strategic investors. The enthusiasm of market players should also be fully mobilized. In the meantime, aggrandizement for personnel training is necessary. Routes for mutual promotion, mutual delivery of tourists, information interchange, and complementary features with other types of tourism activities can be formed. Regarding other factors, supporting amenities and the overall service quality of sports tourism should be advanced, which can increase the construction of public service facilities such as sports service and consulting centers. However, certain literature recommends clarifying tourism's own positioning before building supporting restaurants, hotels, or restaurants. Cultivating a new driving force for economic development by accelerating the development of sports tourism is a better option. The awareness of high-quality development of sports tourism can even enhance the quality of sports tourism resources and the ability to develop sustainably.

Through the analysis of the spatial distribution characteristics of sports tourism resources, this study reveals the main driving factors that affect the distribution of sports tourism resources on a national scale. Certain practical significance is provided for the scientific and reasonable layout and the appropriate and sustainable development of sports tourism resources. However, this study still has the following limitations: First, being limited by the availability of selected indicators, tourism boutique projects in recent years could not be selected as the research object, which restricts the topic pertinence and timeliness. Second, as a new mode of integration and development of two industries, sports tourism has been the subject of relatively few quantitative explorations of the coordination and coupling in different regions and the local natural environment, politics, economy, population, and other related factors. Therefore, deepening research on these issues in the future is necessary to enhance the pertinence and effectiveness of sports tourism development measures. For instance, the new pattern of sports tourism resources after 2018 or the factors such as topography, climatic conditions, hydrological conditions, and population economy can be examined. In turn, the effects of reasonable and effective layout, construction according to local conditions, and coordination of the matching resources and sports characteristics can be identified.

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References

1. Kurtzman, J. Sports tourism categories. *J. Sport Tour.* **2005**, *10*, 15–20. [CrossRef]
2. Cooper, J.A.; Alderman, D.H. Cancelling March Madness exposes opportunities for a more sustainable sports tourism economy. *Tour. Geogr.* **2020**, *22*, 525–535. [CrossRef]

3. Nishio, T.; Larke, R.; van Heerde, H.; Melnyk, V. Analysing the motivations of Japanese international sports-fan tourists. *Eur. Sport Manag. Q* **2016**, *16*, 487–501. [CrossRef]
4. Jin, N.; Lee, H.; Lee, S. Event quality, perceived value, destination image, and behavioral intention of sports events: The case of the IAAF World Championship, Daegu, 2011. *Asia Pac. J. Tour. Res.* **2013**, *18*, 849–864. [CrossRef]
5. Page, S.J.; Bentley, T.; Walker, L. Tourist safety in New Zealand and Scotland. *Ann. Tour. Res.* **2005**, *32*, 150–166. [CrossRef]
6. Fugao, J.; Li, C. All-for-One Sports Tourism:Connotation Characteristics, Spatial Structures and Development Patterns. *J. Shanghai Univ. Sport* **2020**, *44*, 12–23.
7. Zuo, Y.; Zou, L.; Zhang, M.; Smith, L.; Yang, L.; Loprinzi, P.D.; Ren, Z. The Temporal and Spatial Evolution of Marathons in China from 2010 to 2018. *Int. J. Environ. Res. Public Health* **2019**, *16*, 5046. [CrossRef] [PubMed]
8. Ren, Z.; Zuo, Y.; Ma, Y.; Zhang, M.; Smith, L.; Yang, L.; Loprinzi, P.D.; Yu, Q.; Zou, L. The Natural Environmental Factors Influencing the Spatial Distribution of Marathon Event: A Case Study from China. *Int. J. Environ. Res. Public Health* **2020**, *17*, 2238. [CrossRef] [PubMed]
9. Geneletti, D. Impact assessment of proposed ski areas: A GIS approach integrating biological, physical and landscape indicators. *Environ. Impact Asses.* **2008**, *28*, 116–130. [CrossRef]
10. Zhang, Z.; Ding, Z. The Systematic Spatial Characteristics of Sports Tourism Destinations in the Core Area of Marine Economy. *J. Coastal Res.* **2020**, *112*, 109–111. [CrossRef]
11. Wu, L. Classification and Spatial Optimization of Sports Tourism Resources in Guangdong Province. *J. Landscape Res.* **2019**, *11*, 110–114.
12. Mansour, S. Spatial analysis of public health facilities in Riyadh Governorate, Saudi Arabia: A GIS-based study to assess geographic variations of service provision and accessibility. *Geo-spat. Inf. Sci.* **2016**, *19*, 26–38. [CrossRef]
13. Wang, X.; Zou, Z. Open Data Based Urban For-Profit Music Venues Spatial Layout Pattern Discovery. *Sustainability* **2021**, *13*, 6226. [CrossRef]
14. Yoo, D.; Chun, B.; Min, K.; Lim, J.; Moon, O.; Lee, K. Elucidating the Local Transmission Dynamics of Highly Pathogenic Avian Influenza H5N6 in the Republic of Korea by Integrating Phylogenetic Information. *Pathogens* **2021**, *10*, 691. [CrossRef]
15. Allen, M.J.; Allen, T.R.; Davis, C.; McLeod, G. Exploring Spatial Patterns of Virginia Tornadoes Using Kernel Density and Space-Time Cube Analysis (1960–2019). *ISPRS Int. J. Geo-Inf.* **2021**, *10*, 310. [CrossRef]
16. Sokal, R.R.; Oden, N.L. Spatial autocorrelation in biology: 1. Methodology. *Biol. J. Linn. Soc.* **1978**, *10*, 199–228. [CrossRef]
17. Zhang, X.; Lin, Y.; Cheng, C.; Li, J. Determinant Powers of Socioeconomic Factors and Their Interactive Impacts on Particulate Matter Pollution in North China. *Int. J. Environ. Res. Public Health* **2021**, *18*, 6261. [CrossRef]
18. Zou, Z.; Yi, Y.; Sun, J. Entropy method for determination of weight of evaluating indicators in fuzzy synthetic evaluation for water quality assessment. *J. Environ. Sci. China* **2006**, *18*, 1020–1023. [CrossRef]
19. Zhang, S.; Xie, X.; Zhao, M. Asset Specificity on the Intention of Farmers to Continue Land Recuperation: Based on the Perspective of Farmer Differentiation. *Land* **2021**, *10*, 603. [CrossRef]
20. Li, J.; Dou, K.; Wen, S.; Li, Q. Monitoring Index System for Sectors' Digital Transformation and Its Application in China. *Electronics* **2021**, *10*, 1301. [CrossRef]
21. Wang, J.; Xu, C. Geodetector: Principle and prospective. *Acta Geogr. Sin.* **2017**, *72*, 116–134.
22. Chi, Y.; Qian, T.; Sheng, C.; Xi, C.; Wang, J. Analysis of Differences in the Spatial Distribution among Terrestrial Mammals Using Geodetector—A Case Study of China. *Isprs Int. J. Geo-Inf.* **2021**, *10*, 21. [CrossRef]
23. Zhu, Z. WSR: A systems approach for information systems development. *Syst. Res. Behav. Sci. Off. J. Int. Fed. Syst. Res.* **2000**, *17*, 183–203. [CrossRef]
24. Jie, S.; Qingjie, S.; Hongjian, L. Research on the Influencing Factors of Sports Tourism System with WSR Analysis Framework. *China Sport Sci. Technol.* **2010**, *46*, 139–145.
25. Gu, J.; Zhu, Z. Knowing Wuli, sensing Shili, caring for Renli: Methodology of the WSR approach. *Syst. Pract. Act. Res.* **2000**, *13*, 11–20. [CrossRef]
26. Kurtzman, J.; Zauhar, J. Sports tourism consumer motivation. *J. Sport Tour.* **2005**, *10*, 21–31. [CrossRef]
27. Perić, M. Estimating the perceived socio-economic impacts of hosting large-scale sport tourism events. *Soc. Sci.* **2018**, *7*, 176. [CrossRef]
28. Bulatović, J.; Rajović, G. Some aspects of the sport tourism with the review of Montenegro: Overview. *Tour. Educ. Stud. Pract.* **2017**, *4*, 18–28.
29. Yang, S.; Xu, J.; Yang, R. Research on coordination and driving factors of sports industry and regional sustainable development—Empirical research based on panel data of provinces and cities in eastern China. *Sustainability* **2020**, *12*, 813. [CrossRef]
30. Taleghani, G.R.; Ghafary, A. Providing a management model for the development of sports tourism. *Procedia-Soc. Behav. Sci.* **2014**, *120*, 289–298. [CrossRef]
31. Jiao, G.; Lu, L.; Chen, G.; Huang, Z.; Cirella, G.T.; Yang, X. Spatiotemporal Characteristics and Influencing Factors of Tourism Revenue in the Yangtze River Delta Urban Agglomeration Region during 2001–2019. *Sustainability* **2021**, *13*, 3658. [CrossRef]
32. Ruban, D.A. Karst as important resource for geopark-based tourism: Current state and biases. *Resources* **2018**, *7*, 82. [CrossRef]
33. Donaldson, J.A. Tourism, development and poverty reduction in Guizhou and Yunnan. *China Q.* **2007**, *2007*, 333. [CrossRef]
34. Wang, Y.; Wu, C.; Wang, F.; Sun, Q.; Wang, X.; Guo, S. Comprehensive evaluation and prediction of tourism ecological security in droughty area national parks—A case study of Qilian Mountain of Zhangye section, China. *Environ. Sci. Pollut. R* **2021**, *28*, 16816–16829. [CrossRef]

35. Cao, X. Challenges and potential improvements in the policy and regulatory framework for sustainable tourism planning in China: The case of Shanxi Province. *J. Sustain. Tour.* **2015**, *23*, 455–476. [CrossRef]
36. Shi, T.; Yang, S.; Zhang, W.; Zhou, Q. Coupling coordination degree measurement and spatiotemporal heterogeneity between economic development and ecological environment—Empirical evidence from tropical and subtropical regions of China. *J. Clean. Prod.* **2020**, *244*, 118739. [CrossRef]
37. Kurtzman, J.; Zauhar, J. A wave in time-The sports tourism phenomena. *J. Sport Tour.* **2003**, *8*, 35–47. [CrossRef]
38. Yang, J.; Chuang, Y.; Lo, H.; Lee, T. A Two-Stage MCDM Model for Exploring the Influential Relationships of Sustainable Sports Tourism Criteria in Taichung City. *Int. J. Environ. Res. Public Health* **2020**, *17*, 2319. [CrossRef] [PubMed]