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Article

The Regional Pattern and Hierarchical Tendencies of Service-Oriented Tourist City Network: A Connectivity Analysis of 63 Cities in China

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Abstract: [Background] Previous research achievements of the service-oriented tourist city network have often focused on the analysis of its geographical distribution and service role of the important cities instead of the connections and hierarchical tendencies between the whole city in a large region.[Method]Using big data approaches on the regional connections of 38 tourism organizations including famous hotels, air passenger transport, tourism service agencies across 63 most important tourist cities in China. Fuzzy c-means clustering analysis is used to define 8 city arena clusters. [Results]According to the distributions of connectivity between 63 cities, these eight clusters play different service functional roles in the urban tourism network at four hierarchies. With their "center-edge" memberships, these arena clusters are formed by the interweaving process of regional and hierarchical tourism service connections. The results include the analysis of the various service-oriented tourist city in China and point out the geography "gap" faced by network. [Conclusion] Service-oriented tourist cities need to find their hierarchies and positioning in the network scientifically to avoid blind development, to make regional urban tourism sustainable development.

Keywords: tourism geography; city connectivity; tourism services value; functional role; urban hierarchy; regional pattern

1. Introduction

One of most important academic viewpoints in Castells' theory of the network society relates to such practice phenomenon that important tourist cities across some specific large regions are used by different capitals as "basing points" in the connection network of service and production [1]. The resulting connections make it necessary to promote the development of important cities and arrange some service-oriented tourist cities into a connected network hierarchy. However, the lack of theoretical agreement on the defining characteristics of service-oriented tourist cities in the network that perform their important tourism service functions has resulted in scientific taxonomies[2], may usually limited to focus on the highest hierarchical cities [3]. Except for the lack of undisputed definition of service-oriented tourist city itself, the main reason for these eclectic approaches are the lack of systematic and reliable data [4], which is of course related to the absence of undisputed definition characteristics of service-oriented tourist cities. One of the main consequences of this problem associated with Friedman's description of "complex spatial hierarchies" is that cities that are lower in rank or appear less important are still not evaluated in this transnational or regional hierarchy [5]. The main purpose of this study is to rectify this research limitation: We investigated a great quantity of representative tourist cities in specific regions.

However, many research achievements on tourist cities lack to consider the service function and hierarchical differences of various service-oriented tourist cities in the urban tourism network from a large whole region, which results in the lack of scientific positioning and reasonable development strategies for service-oriented tourist cities of different hierarchies. In fact, different tourist cities will

performance frequent or minimal connection in the urban tourism network. The reason for these differences is that various cities play different functional nodes (such as " basing points ") in the network, and the corresponding cities have different service function types and service scopes. This difference essentially comes from the abilities in gaining capitals competed by the cities, this characteristic can be reflected in the hierarchical tendency differences in network connections. For example, Beijing as an international service-oriented tourist city, is the national center of polity, culture, education, transportation, these important urban functions determine that many tourists will most likely prefer to travel to Beijing. At the same time, Guilin in China, despite its high-quality natural landscape tourism resources, but there are not many types of urban functions, and the city's financial, exhibition, cultural, transportation and other service functions are not powerful, so it does not occupy an important hierarchical in the tourism connection network.

Various scholars empirically attempt to use the interlocking network model (INM) designed by Taylor [6] to analyze the service-oriented tourist city network, and then it has been widely studied and applied in the service-oriented tourist city connection network from the perspective of regionalization. Because of the connected network closely relating to the geographical location in reality, it is necessary to describe and explain the connected model of interlocking network based on tourism services from the geographical perspective, and point out the geography "gap" faced by service-oriented tourist city network. The research question of this article is: how to scientifically divide the hierarchical tendencies and role of tourist cities in the tourism service connections from the regional perspective in the urban tourism network, and point out the regional patterns between cities of different clusters and hierarchies for the future regional tourism policy formulation. Through our academic efforts, we will improve the division and evaluation field of city connectivity network for tourism geography research.

2. Literature review

2.1. The Hierarchy of tourist cities and the Flow space theory of Castells

Service-oriented tourist city refers to a city with natural or artificial tourism attractions, and a relatively complete tourism service reception capacity, its tourism service industry account for a certain proportion of the city's income, and can provide corresponding services for foreign tourists of different demand levels[7]. Therefore, urban tourism network is defined as an organic aggregate of various service tourism organizations pursuing regional location strategy. In this way, relying on the representative service tourism organizations, small and medium-sized tourist cities in different geographical locations and large tourist cities together form the interlocking network structure: through mutual tourism connections, each service-oriented tourist city can become the tourism service provider of network [8]. The network of service element flows are an integrated network that is formed by various elements such as service capital flow, tourist flow, information flow, communication and interaction of tourism companies"[1]. In short, service element flow is the leading activity of the network in tourist city society, which will lead to different service levels of urban in the process of connections, and it also reflect the differences of tourism service functions and size of tourist cities in a specific region. Castells pointed out that the characteristic of the flow space is "a material organization that operates with the characteristic of flow and relies on various pipelines or technical networks to share the synchronicity of social practice"[2]. This kind of convergence traditionally relies on the physical proximity, that is, the simultaneity of the presence, it needs to connect simultaneity between various cities in the network society. According to Castells' theory, the representative tourist cities in the region construct the spatial form of network structure through tourism service connection. It is composed of three aspects: first, the connection and communication between tourism service industries; second, different tourism service functions such as guiding nodes, service bases or tourist centers from different cities in the network; third, the spatial structure of the dominant central cities and some edge cities.Through understanding the flow network structure of tourist cities with different hierarchical tendencies in a region can better formulate the

tourism development strategies of different ranks of cities and promote the healthy development of regional tourism.

2.2. Fuzzy c-means cluster analysis

To analysis scientifically the hierarchical tendencies and regional patterns of various cities, cluster analysis is one of the most popularly empirical analysis techniques to study the data matrix of a very large number of tourist cities. In this paper, the traditional clustering algorithm is applied to the relation matrix generated based on the connection between various cities, and then the mutually exclusive city clustering is calculated according to the "tourism service value" of the service-oriented tourist city in the network. But this classical clustering analysis method is full of various problems in practical application [9] :

Firstly, the connected network of various tourist cities does not show a simple and absolute hierarchical city structure [10]. In fact, the connections between different tourist cities are a complex network rather than a simple hierarchical structure [10]. This is an empirical support for the opinion in Taylor's paper[12]. Therefore, the clear patterns provided by traditional clustering algorithms are unlikely to provide an accurate and sensitive specification in a complex city network.

Second, the functional patterns and hybrid hierarchy increase the complexity of network. when the networks of various scales are gathered together in a large region, the result is a complex network structure, showing multiple regional patterns and hierarchies. Therefore, the exploration of service-oriented tourist city network should include the evaluation of the hierarchical structure of overall region and the intertwining of regional patterns. Similarly, traditional crisp cluster classification analysis is unlikely to provide sensitive specifications for the scrambling patterns [13].

Third, the previous classification evaluation is limited to the medium and upper rungs of the urban hierarchy system. The main reason is that the outer areas of the urban network will be classified based on sparse data, so any classification based on the data will yielding vagueness[14]. Therefore, minor changes in sparse data usually yield completely different classification results, while mutually exclusive cluster classifications will not be unbiased in theory.

2.3. The interlocking network model (INM)

INM originated from the early scholars' criticism of the conceptual and empirical defects in the world city literatures. Beaverstock (2000) argues that many of these concepts only focus on measuring the attributes of tourist cities, while ignoring the importance of connected relationships within regional urban systems [15]. David and Michael (2001) then improved the INM to specify the "service-oriented tourist city network" based on the relationship between cross regional leading organizations and other internal tourism service organizations [16]. In a word, INM provides scholars with a specific solution to the problem of network relations. Although it is difficult to obtain the comprehensive data of the flow relationship between cities in practical research, the urban interlocking network structure can be measured by the connected relationship between cities.

Today, INM uses samples from different tourism organizations to apply urban tourism research at regional, nation and global scales. Some scholars use the subsidiaries of famous international companies in different cities to judge the frequency of tourism communication between the subsidiaries and the parent company[17]. Then, we can further determine the functional value of the city in the tourism connection network. These types of companies include airlines, large hotels, financial services offices, e-tourism service platforms, etc[18].

2.4. The connections between various service-oriented tourist cities and their hierarchical tendencies

The contemporary study of tourist cities started with professor Bao jigang[19,20], identification of "center city" to manage and control the "regional tourism service market segment" created by multi regional tourism organizations. This theory reflects Wise's recognition of the transition from individual urban economy to regional economy, which is characterized by the inevitable development trend of increasingly integrated regional tourism network [21]. Tourist cities are the

basing points for connected network, so their specification are related to the identification of "city in the tourism relationship matrix within the region", as *The Travel & Tourism Competitiveness Report 2017* [22] shared with us. Therefore, the relevant discussion focuses on the "regional urban tourism network" [23], a "transnational urban tourism system"[24], "functional service-oriented tourist city system", or a "global urban tourism network" [25]. The integration of these different concepts has never been sufficient analysis and discussed on this aspect in the literature for service-oriented tourist cities.

tourism connection networkOne of the most fundamental changes, according to the *Travel and Tourism Competitiveness Report 2019* [26], for a long time, the city economic bases have been transforming from industrial manufacturing industry to high value-added service industry. This self-accelerative transformation is reflected in the emergence of more and more types of tourism services in important world cities[17], unable to cope with the increasing pressure of regional city structural changes and innovation of tourism service products, more and more cities may lose their attraction gradually, and their tourism influence within the region tourism network may decline. The important point is that these tourism services are an indispensable factor of city services that have their own growth potential. Compared with other fields of urban tourism service sector growth, this rapid growth is also the result of the interacting results of demand derived from other sectors [27]. The reason is that tourism service organizations in these cities will benefit greatly immensely from advances in communication technology and information virtualization technology, which will enable them to broaden the spatial scope of tourism services. For example, tourism organizations are generally related to the characteristics of tourism demand groups in specific cities, such as "air tourism organization", "tourism hotel management alliance", etc., but under the conditions of contemporary globalization, due to China's huge tourist scale advantage, it can easily realize "small profit and quick turnover". Some city's tourism organizations choose to implement various chain service alliance strategies in China, there are many tourism subsidiaries, which rely on standardized services to gain competitive advantage[28]. Based on these observations, we focus on the tourism service process between various cities enables us to test such a proposition that there is a complex tourism service, which has distinct characteristics of geographical location and regional patterns.

This kind of tourism service needs the cooperation and convenience brought by the distribution of various tourism service organizations. Therefore, the headquarters of tourism service organization may bring more "tourism service value" than the subsidiaries. However, headquarters of tourism service organization usually requires the service-oriented tourist city to have a better location in the urban tourism network[29]. In this context, different headquarters of tourism service organization tend to aggregated distribute in the large cities with perfect urban functions and having a wide range of influences, so these cities are often at the highest hierarchical tendencies in the tourism service network, and they have a leading role in surrounding cities[18]. The higher the hierarchy of service-oriented tourist city, the more effective it is to neutralize the distance as an impediment of tourism destination decision-making[17]. In fact, for the consideration of location strategy and tourism externality of high-hierarchy tourist cities, there will be different ranks of cities around the leading service-oriented tourist city in a region. They have different service division and urban functions around the tourism service industry chain, and their spatial distribution structure within the region will form a tourism connection cluster[30].

2.5. Advanced tourism services organizations and the representation of city connection hierarchy

Drawing on the research achievements of scholars from various fields on the role of advanced tourism services in the formation of the city network. GaWC has theoretically explained the collection of connected data (http://www.lboro.ac.uk/gawc). According to GaWC's collection principles, this paper treats important service-oriented tourist cities as tourism service centers in specific regional network, so we have tried to develop a method to analyze and measure the networks of service-oriented tourist city [31]. It will choose the affiliated type (head office or subsidiary) of various advanced tourism organizations in different tourist cities[23]. Then, there must be some tourism connection between the tourism head office and the tourism subsidiary, so that the city can be given

a certain score, for example, the city with the head office is recorded as 5 points, while the city with the general subsidiary is recorded as 2 points. Finally, according to the city scores of different advanced tourism organizations in some given city, the scores of several advanced tourism organizations in a city can obtain the total score of service-oriented tourist city in the whole network connection, and the total score of these cities can reflect the difference in importance of different cities in the urban tourism connection [32]. This method is not to assume that service-oriented tourist cities will form an obvious city hierarchy, but to designate a tourism network in a region, according to the connection between different advanced tourism industries in various cities, the "hierarchical tendencies" can be revealed[6]. Based on previous urban tourism network research, this can bring two advantages: first, advanced tourism industry has widely representative. Their data are relatively easy to obtain, due to various connections and exchanges between various cities, the data needed is quite huge, this can solve the problem of research data deficiency to the greatest extent; and second,

the urban tourism network is to bring a very large number of service-oriented tourist cities into the connection network for analysis. The analysis of the relationship between multiple cities in the whole region is closer to reality, so we can have an overall understanding of the city connection in the tourism region. However, before we describe these results in detail, this empirical principle needs to spelt out the conceptual problems.

2.6. Conceptualization: Service-oriented tourist cities as regional centers

The concept of important service-oriented tourist city as a regional center has been elaborated in GaWC research[6]. Service-oriented tourist city can be regarded as the center of a regional tourism service network, and various types of tourism service organizations (headquarters or subsidiaries) in network focus on providing services for tourists with different travel purposes and consumption levels. So, the tourism connection network can be formally specified as the interlocking network model (INM). The interlocking network has three levels: network level, various cities at different levels connected in regional tourism economy; node level, some cities playing a pivotal role in a specific region; and at sub-node level, including senior tourism organizations providing different specific services for tourists. So, the formations of service-oriented tourist city network are carried out at three levels, through their cooperation with different levels of network, we can provide seamless connection services for tourists across different geographical locations of the whole region.

The connectivity of urban tourism network can be formally expressed by the matrix V_{ij} defined by n cities × m tourism organizations, where V_{ij} is the "tourism service value" of city i to tourism organization j. The value of tourism services reflects the importance of a city to the relevant tourism organizations of tourism service network. Therefore, every column denotes a tourism organization's regional layout strategy and every row describes each city's mix of tourism services. These allow for two types of research: the focus column will let us know about tourism organizations; and the focus will inform our knowledge of various tourist cities. In order to achieve research objectives, our empirical analysis concentrates on the latter type of research, understanding the service-oriented tourist city configuration within the relational data.

2.7. Connectivity of urban tourism network

The advantage of accurate specification of connectivity in network is that network analysis technology can be used. Using the basic elementary network analysis, the most basic measure of a city is its connectivity with the relation to all other cities in the matrix. According to Derudder [33], the interlocking network is defined as follows.

$$\lambda_{ab,j} = V_{aj} \times V_{bj} \quad (1)$$

Where $\lambda_{ab,j}$ is the elements interlock connection between city a and city b in terms of tourism organization j defined in term of matrix V, a tourism service value of a tourism organization in a city. These connections can be aggregated into intercity interlocking links:

$$\lambda_{ab} = \sum_{j=1}^{n} \lambda_{ab,\,j} \quad (2)$$

j=1,2,3,……,n; n is the total number of tourism organizations. Every city has such interlock connection with other cities. All the internal connections of a city are aggregated to form the regional tourism network connectivity (C) of the city:

$$C_a = \sum_{i=1}^{m} \lambda_{ai} \quad (3)$$

for city a across all cities in matrix **V**. i=1, 2, 3, ……, m, m is the total number of cities.

The limiting situation is that a city does not share tourism organizations with any other cities, so all these basic connections are 0 and it has no connectivity. In fact, in the case of large data sets, the connectivity of the urban tourism network may be quite large. To make them easy to manage in the following use, we express city connectivity as the ratio of the largest connectivity calculated in the data, thus creating a scale from 0 to 1. These scores will be used below to represent the hierarchical tendencies in our analysis.

3. Methodology

3.1. Case selection

China currently has 393 prefecture-level cities (as of December 31, 2019), but there are not many service-oriented tourist cities. In initial work, 70 cities were assessed for "famous service-oriented tourist city", but combined with some tourist cities in the city scale, urban tourism representativeness, and other aspects of the existing problems. For example, *Yangshuo* of China is a county-level service-oriented tourist city that is well-known at home and abroad, but this paper selects cities above prefecture-level cities with larger administrative scale. *Dunhuang* of China is also a world-famous service-oriented tourist city, but it is not a service-oriented tourist city mainly based on history and culture, and the characteristics of urban tourism service industry are not obvious. After a strict selection, we devised a "roster" of 63 service-oriented tourist cities, 60 service-oriented tourist cities selected from the statistics department of the *Ministry of Culture and Tourism of the People's Republic of China* (the most authoritative tourism management department in China), which represents the important regional composition of urban tourism industry in mainland China. At the same time, this paper also adds three cities including Hong Kong, Macao, and Taipei, because there are also obvious tourism service connections with the 60 cities. These selected 63 cities have good tourism reputation, they all have a complete tourism service industry, and the income of urban tourism occupies an important part of local city economic income. They are all relatively famous service-oriented tourist cities in China, and the cities are selected for their network connectivity is at least one twelfth network connectivity of the highest city according to the preliminary calculation. Therefore, this paper has a total of 63 samples (Table 1).

Table 1. List of 63 key tourist cities in China.

Geographical region	City name	Number
North China	1.Beijing, 2.Tianjin, 3.Shijiazhuang, 4.Hohhot, 5.Qinhuangdao, 6.Chengde, 7.Datong, 8.Taiyuan, 9.Luoyang	9
East China	10.Shanghai, 11.Nanjing, 12.Hangzhou, 13.Qingdao, 14.Ningbo, 15.Wenzhou, 16.Xiamen, 17.Suzhou, 18.Wuxi, 19.Nantong, 20.Lianyungang, 21.Jinan, 22.Yantai, 23.Weihai, 24.Hefei, 25.Fuzhou, 26.Huangshan, 27.Quanzhou, 28.Zhangzhou	19
South China	29.Guangzhou, 30.Shenzhen, 31.Zhuhai, 32.Shantou, 33.Zhanjiang, 34.Zhongshan, 35.Nanning, 36.Haikou,37.Sanya, 38.Guilin, 39.Beihai	11
Central China	40.Wuhan, 41.Changsha, 42.Nanchang, 43.Zhengzhou, 44.Jiujiang, 45.Zhangjiajie	6
Northeast China	46.Shenyang, 47.Dalian, 48.Changchun, 49.Harbin, 50.Jilin	5
Northwest China	51.Xi'an, 52.Lanzhou, 53.Xining, 54.Yinchuan, 55.Urumqi	5
Southwest China	56.Chongqing, 57.Chengdu, 58.Kunming, 59.Guiyang, 60.Lasa	5
Hong Kong, Macao and Taiwan regions China	61.Taipei, 62. Hong Kong, 63. Macao	3

Note: In addition to the three tourist cities in Hong Kong, Macao and Taiwan, the other 60 cities belong to the key tourist cities monitored by the Chinese tourism government.

3.2. Data production

To make these data credible, the important problem is the inherent subjective response in the process of data creation: the obtained data does not have the key attribute of inter-subjectivity. In other words, the use of the same data information does not always determine the same boundary results. So, a key problem needs to be faced, that is, due to the large uncertainty of created data, will there be irreparable credibility defects in empirical analysis? There are two ways to reduce the impact of this problem: first of all, the scoring method is designed to be as simple as possible, with the principle of "0 means there is no distribution, 2 as the normal conditions, and 5 as the highest " to count the distribution types of each tourism service organization in each city, therefore the subjective decision-making evaluation of organization types in this paper is limited to some relatively simple boundaries. Secondly, the empirical analyses are carried out in a very large number of tourism organizations (as many as 38 tourism organizations), so it is possible to iron out the accidental differences of specific individuals in the overall analysis designed for the data. Finally, like all data production, the generated relational data value distribution has good credibility.

In this empirical data collection, we are faced with the information of some tourism organizations is very detailed and the information of other tourism organizations is much less. Therefore, by designing a relatively simple scoring system to accommodate multifarious information collected, and selecting the measurement items with the same statistical caliber, this can solve the tension of unequal data distribution. Using the six-point scale (0,1,2,3,4,5), two levels can be given easily, the score is zero when there is no specific tourism organization in the city, and cities houses a headquarter of tourism organizations have a score of 5. Therefore, the key point of scoring decision is to allocate the middle four scores (1, 2, 3 and 4) to describe the tourism service value of various cities. It means that three boundaries must be specified for each tourism organization between 1 and 2, 2 and 3, 3 and 4 [34].Therefore, the basic strategy of this paper is to obtain a 2-point score from cities that assume having non-tourism headquarters (i.e. sub-organizations), this score 2 represents the "typical" or "normal" service level of a given tourism organization in a city. To determine this normality, we need to have an overall average of the organization's distribution across all tourist cities. But sometimes some travel service organizations do not reach a given "normal" or "typical" level. For example, if a tourism organizations' service is shared by other cities, and its service scope for a single city is actually small, the corresponding tourism organization in that city will be both scored 1. and a tourism organization in the city showing very few (perhaps none) professional tourism services or tourism participants would also score 1. Generally speaking, the boundary between 2 and 3 is based on the size factor of tourism organization service scale, while the boundary

between 3 and 4 depends on the extraterritorial factors of organization type layout. For example, a super large tourism organization type with many employees will lead to score 3 in this city where the organization is located, while a tourism organization with a regional headquarters will lead to a city score of 4. In fact, if possible, in order to determine the boundary scientifically, it is necessary to consider the mixture of service scale and extraterritorial information in deciding on the boundaries for each tourism organization in various cities. The end-result is the service value matrix V, which is an m x n matrix data group. therefore, this matrix data group in this paper has 63x38 specific data array with the V_{ij} ranging from 0 to 5.

3.3. Data collection

Precise specifications guide our data collection process relatively smooth. This kind of data collection method is described in detail in the collection method of Taylor et al [34]. In this paper, a representative advanced service tourism organization is defined as a tourism organization with offices in 10 or more different cities, and each prime geographical region (for example, eight geographical regions in China, see table1) has at least one service tourism organization. The tourism organizations that meet the data criteria are selected from the ranking of major tourism organizations in different service sectors (Based on the query three major tourism website platforms in China, including *https://www.ctrip.com/*, *https://www.qunar.com/* and *https://m.lvmama.com/*, the query objects are the three kind of major tourism service sectors which include famous hotels, air passenger transport and tourism consulting service agencies. Another important criterion is that it is purely practical whether sufficient information can be found on the organization's home page website. The most important tourism fields that can reflect the value of a city's tourism service are: the distribution of famous hotels at home and abroad [35], the service capacity of tourism air passenger transport [36], and the distribution of tourism consulting service agencies[37]. These representative tourism organizations can be included to promote the comparison with the real competitiveness of different tourist cities [38].

Therefore, the paper selected 38 tourism organizations according to the actual situation of tourism services in China (Table 2):

38 advanced tourism organizations were identified in three sectors: 20 in hotel hospitality; 13 in tourism aviation; 5 in tourism consulting service agencies. 63 tourist cities were then used to create some measurement data on the 38 services organizations for a regional multivariate analysis of service-oriented tourist cities [29], the efforts successfully stimulated a new data collection exercise on the tourism relations covering 63 cities and 38 representative advanced tourism service organizations. The analysis of cities should not be as many as possible, because as the size of the relational data matrix increases (i.e. more cities have been added.), it may become relatively "sparse" (many zero entries), which reduces the reliability of the analysis. So, these cities were selected for their network connectivity is at least one twelfth network connectivity of the highest city.

Table 2. List of 38 representative service tourism organizations.

Service Organization types	Organization name	Number
famous hotels at home and abroad	**International famous hotel:** *Hilton Hotels Corporation*, *Intercontinental Hotels Group*, *Marriott International*, *Inc. Hotels*, *Harbor Plaza Hotels & Resorts Hotels*, *Best Western International*, *CENDANT Corporation*, *Kempinski Hotel*, *Starwood Hotels & Resorts Worldwide*, *ACCOR*, *Shangri-La*	10
	Famous Hotels in China: *Vienna Hotel*, *Jinjiang INN*, *Hanting hotel*, *BTG Homeinns hotels*, *Seven Days Hotel*, *Green tree Hospitality Group Hotel*, *All Seasons hotel*, *Atour Hotel*, *Lavande Hotels*, *Super 8 hotel*	10

Tourism air passenger transport	Air China *China Southern airlines*, *China Eastern airlines*, *Hainan airlines*, *Eva airways*, *Shenzhen airlines*, *Juneyao airline*, *Spring airlines*, *China airlines*, *Cathay Dragon Airlines*, *Cathay Pacific Airways*, *XIAMEN AIR*, *Air Macao*	13
tourism consulting service agencies	*China International Travel Service*（*CITS*）, *China Travel Sevrice*, *China Comfort Travel Headquarter*, *China Cyts Tours Holding Co.,Ltd.*（*CYTS*）, *Citic Travel Co., Ltd*	5

3.4. Fuzzy classification

In order to show the data structures more comprehensively, therefore, the paper propose to replace the crisp separation of clusters, defined by $\gamma_{it} \in [0, 1]$ for all i=1,2,3,…,m; t=1,2,3,…,T, by a fuzzy notion, and γ_{it} is the crisp membership of a city; n is the number of cities that need to be classified(63 cities in this paper); T is the number of clusters; so, γ_{it} is the service value of city i in tourism organization t (ranging from 0 to 1)[29].

The fuzzy clustering analysis of classification scheme calculates the grades of membership in various tourist cities instead of providing information about mere membership [33]. The approach can easily reflect the expected complexity of intertwined and multiple profiles in any tourism connection classification, because it is reflected by the hybrid membership relationships in various clusters. In addition, previous research results indicated that the sensitivity of fuzzy clustering algorithm can simultaneously evaluate the hierarchical tendencies and the main cities connection range [39]. Finally, the minor changes in the data will be reflected in the results of city classification, thus reducing the occurrence of bias problem. However, based on the fact that the classification of a few tourism organizations will be affected by the bias, this paper will limit the analysis to the case of representative tourism organizations with frequent services, and select 38 advanced tourism service organizations with certain popularity, so as to avoid such a sparse section in the matrix. So, this results in a matrix data set containing the distribution of 38 advanced tourism organizations in 63 tourist cities. Choosing different number of clusters will yield different significant results. Therefore, in the analysis of city classification, we should try our best to make the difference between the members of the cluster smaller, and make the difference between different clusters as large as possible, take these as the principle of city classifications.

4. Results：hierarchical tendencies and regional patterns of tourist cities

Through multiple debugging of fuzzy clustering analysis, we will focus on the result of T = 8, which is an ideal choice after evaluating several solutions of different clusters. In the eight clusters, we find that the hierarchical tendencies and regional patterns of the service-oriented tourist city network have a broad diversity, and the connectivity difference between different clusters is obvious, which provides an ideal insightful interpretation for us. In order to clarify the argument, the results of this paper will be expressed in simplified form, and the "nucleus" and "hybrid" members in the cluster will be identified.

This new complex hierarchical tendencies and regional geographical patterns of tourist cities are shown in table 3 and figure 1. The table 3 highlights their hierarchical tendency differences in the results of city classification, and we can clearly see that there are obvious differences in the average connectivity of different clusters. Table 3 also shows the number of cities contained hybrid members and the most typical cities in each cluster. These hierarchical tendency differences of average connectivity are used to represent the four arenas in turn to represent the hierarchical tendencies distribution around the cluster I which is the most important in terms of city connectivity. The most central cluster I can be called the "center" of the regional tourism network in China, and the reason can be clearly expressed from the intuitive distribution in Figure 1. The divisions of arena are mainly determined by their status and function in regional tourism connection. According to the fuzzy

classification in Figure 1, we find that the tourist cities in the regions have the obvious geographical structure of "center-edge".

The regional patterns of city hierarchy in the results is reflected in different arenas in Figure 1. Different arenas are depicted as their respective banded areas around the center. In addition, most of their cities are roughly located in their geographical locations, which also proves the first law of geography "*the space closer the cities are, the more likely they are to be connected*". Figure 1 shows the hierarchical tendencies distribution centered on Beijing, Shanghai, Guangzhou and Shenzhen, which is a large-scale regional structure across eight geographical regions in China. Eight clusters are distributed in four arenas with different tourism functions, in addition to the nucleus cities in the first hierarchical arena. The other three arenas also have some nucleus cities with strong regional functions, and there are some relatively independent singular cities in a small scope, some hybrid cities with strong cross regional influence, a small number of near isolates cities in remote areas. In a whole, these four arenas have different tourism functions and undertakes the task of different tourism chain, these mean that the four arenas have relatively clear regional characteristics. Therefore, the results of these regional patterns reflect the strength of city hierarchical tendencies.

Table 3. Bands of arenas in the service-oriented tourist city network.

Cluster arena	Service-oriented tourist city band	Average connectivity	No. of members[1]	Typical cities
I	the first hierarchy	0.958	4	Beijing, Shanghai, Guangzhou，Shenzhen
II	the second hierarchy	0.762	6(1)	Chongqing, Chengdu
III	the second hierarchy	0.650	8(3)	Changsha, Wuhan, Hongkong, Taipei
IV	the third hierarchy	0.541	14(3)	Zhengzhou, Zhuhai, Macao
V	the third hierarchy	0.427	10(1)	Hefei, Jinan
VI	the third hierarchy	0.325	12(2)	Nanning, Guiyang
VII	the fourth hierarchy	0.234	11(5)	Zhangzhou, Lianyungang
VIII	the fourth hierarchy	0.178	7(3)	Datong, Beihai

Notes: Memberships of cluster are defined as affiliation of 0.3 and above; hybrid cities with membership of other clusters are figured in brackets.

In order to further interrogate these results required some detailed analyze at the content of the different arenas. According to the above four types of cities in the arena / cluster, the cities in each cluster or arena are defined as four types of tourist cities: the first type is the nucleus city, that is, the core of the cluster is composed of cities with a affiliations degree above than 0.8; the second type is a singular city, and it is also the members of cluster with affiliations are between 0.3 and 0.8, they have no important member-ship with other clusters; The third type is hybrid city refers to the members of this cluster which share the membership with another cluster; The fourth type, near isolates city refers to the city that does not belong to the cluster(because of its affiliation is not as high as 0.3), but it has the highest membership affiliation with the given cluster.

From the above discussions, we should focus on the regional patterns, and we order the analysis and discussion through the differences of hierarchical tendencies.

4.1. The leading central service-oriented tourist city and the first hierarchy

Table 4 exhibits four types of cities in the first hierarchical arenas. The distribution of the first hierarchical cities is very simple, it consists of four nucleus city and nothing else.

Table 4. The leading central service-oriented tourist city and the first hierarchy.

City type	I
Cluster nucleus	Beijing, Shanghai, Guangzhou, Shenzhen
Singular members	
Hybrid members	
Near isolates	

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Beyond the cluster nucleus, there are no singular members, hybrid members, near isolates in the first hierarchical arenas. The arena at this hierarchy is composed of some important central tourist cities with international tourism influence. From the list of these first hierarchical cities, their connectivity degrees are all very high (Table 3). They are also completely independent and characteristic tourism service complex. These are why the first hierarchical arena is designated as the leading center of network, and as the pivot of tourism connection of other lower hierarchical cities (Figure 1).

These four cities in the first hierarchical arenas are the leading service-oriented tourist cities that have specific relations amongst other cities of different hierarchy. Beijing is China's political, cultural, educational, and traffic center, these urban functions will attract a wide range of tourists from home and abroad. Shanghai is China's economic, financial, international trade, and logistics center, a lot of tourism demands will be due to economic and trade needs. Guangzhou is the commercial capital of China for thousands of years, *the Guangzhou Export Commodities Fair* and other business activities attract various people from home and abroad to travel. Shenzhen is the center of China's technological innovation, which will attract many foreigners to make business tourism. It can be seen that these urban functions of four cities are oriented to international demands and can serve a wide range of international and domestic tourists. At the same time their service characteristics are significantly different. The first hierarchical arena is a cross regional service scope, connecting most other cities in China, including tourist cities with different service scales in eight geographical regions of China. However, the composition of the main domestic tourist markets served by four central cities is different. Beijing has more tourists from northern China. Shanghai has more tourists come from eastern China and Taiwan tourists. The group of tourists in Guangzhou are more from southern and southwest China. The main tourists in Shenzhen are tourists from southern China, Hong Kong and Macao. Although Sun has suggested that these difference in domestic tourists is more due to geographic spatial distance[40].

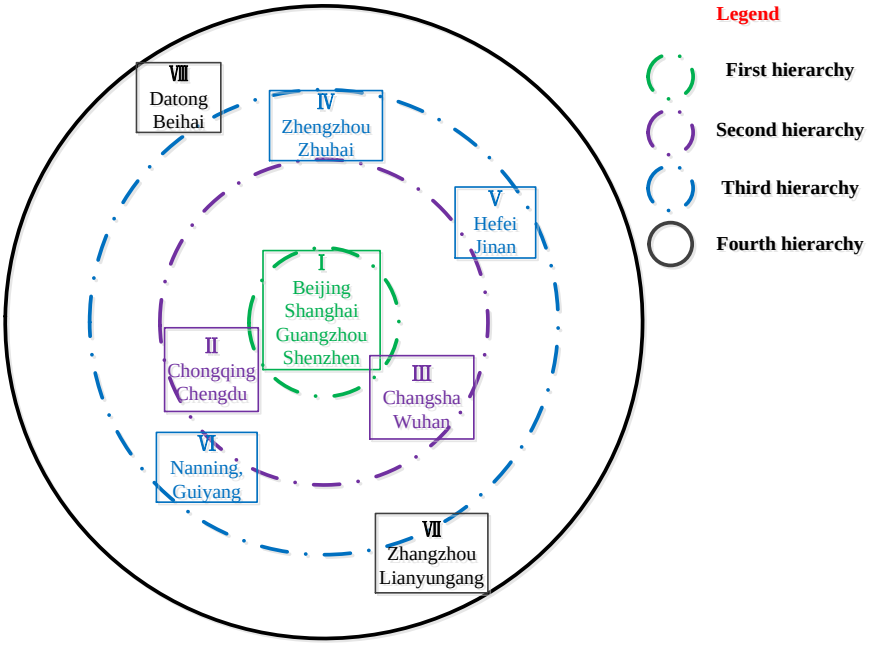

Figure 1. Tourism arenas of the service-oriented tourist city connected network.

Note: some typical cities in different clusters are listed in the text box, the dotted line between the different hierarchies indicates that some hybrid cities can cross these boundaries.

4.2. The major regional service-oriented tourist city and the second hierarchy

The second hierarchical arenas (Tables 5) are some important clusters of major regional tourist cities. There are two classic clusters in the second hierarchy: Cluster Ⅱ is a distinctive cluster that includes all the important cities of West China (northwest China and southwest China) not in first hierarchical arenas; Cluster III is a cluster mainly composed of emerging tourist cities, including many important cities many fast growing economically developed service-oriented tourist city not in first hierarchical arenas. Arena Ⅲ includes two coastal city cities as singular members, they all have unique tourism characteristics in China. Xiamen is the coastal tourism representative of subtropical maritime monsoon climate. Sanya is the representative city of coastal tourism in the tropical monsoon climate region. They are currently hard to replace in China, and they serve national tourists, but they are geographically isolated from the central region and are not surrounded by strong tourism competitors and partners[41]. Arena Ⅱ and Arena III all have important Hybrid members. Arena Ⅱ has a hybrid member, Hong Kong, which are connected with Arena III. Hong Kong is a world famous international metropolis, although in recent years, due to the rapid development of the mainland cities, its comparative advantage had fall a little, but its function of finance and trade is still in an obvious advantage compared to the leading central service-oriented tourist city, it still has frequent tourism connections with many important service-oriented tourist cities in China, so it is easy to understand it belongs to the hybrid city. The latter Arena III has three hybrid members, in addition to Hong Kong, Taipei and Suzhou are also in the list. As a metropolis, Taipei has close tourist connections with important cities such as Shanghai, Nanjing, Xiamen, and Hangzhou. Suzhou is a city with extremely rich tourism resources, but it is obviously affected by both Shanghai and Nanjing. It is closer to Shanghai in terms of tourism economy, but in fact it is directly affected by Nanjing in terms of administrative jurisdiction.

Table 5. The major regional service-oriented tourist city and the second hierarchy.

City type	II	III
Cluster nucleus	Chongqing Chengdu Xi'an Nanjing Hangzhou	Changsha Wuhan Qingdao
Singular members		Sanya Xiamen
Hybrid members	Hong Kong＞Ⅲ	Hong Kong＞Ⅱ Taipei＞Ⅲ Suzhou＞Ⅲ
Near isolates		

In a word, both these cities of Arena II and Arena III all have independent and complete urban tourism functions. Although they are under the influence of the first hierarchical cities of the urban tourism connection network, they are all has a stable tourism connection with other small and medium-sized tourist cities within its own region, so these cities are typical regional tourist cities.

4.3. The nodal service-oriented tourist city and the third hierarchy

These service-oriented tourist cities of the third hierarchical arenas (Tables 6) have important node functions attached to the important tourist cities on the upper hierarchy and serve the tourist cities at the lower hierarchy. There are three classic clusters in the third hierarchy: Cluster IV includes some provincial capital city and economically developed cities not in first and second hierarchical arenas; Cluster Ⅴ is a distinctive cluster that includes, mainly some provincial capital cities with medium economic level, as well as some specialized tourist cities such as Guilin and Huangshan. Cluster Ⅵ is mainly composed of some traditional tourist cities like Qinhuangdao, Luoyang, Zhangjiajie, and other important city nodes of *The Belt and Road Initiative*, such as Quanzhou and Nanning city. In addition, Cluster Ⅵ includes three important provincial capital cities in northwest China as singular members, they are all important node cities in the vast northwest region, and the

transportation choices for tourists to the northwest region will give priority to the three cities as transit cities. However, the geographical location between them is far away, and the connection between them is not frequent compared to developed cities, but they are important node cities within the scope of each province. Three cluster in the third hierarchical arena all have no near isolates members, but they all have important hybrid members, these clusters share the unique structure of some tourist cities with other clusters, which is a typical feature of the third hierarchical arena. In cluster Ⅳ, besides Taipei and Suzhou, Macao also belongs to hybrid cities. Macao is a special administrative region of China, protected by preferential policies for tourism. As an important city for gaming tourism, Macao attracts a very large number of tourists from other cities in China. Cluster Ⅴ has one hybrid member, Macao, which is connected tourism serves with many tourists from various cities of this cluster. Cluster Ⅵ has two hybrid members, Weihai and Yantai, which are belong to the developed cities along the coast of Shandong Province. They also belong to the temperate monsoon climate and are adjacent to Liaodong Peninsula of China, and they serve tourists in north China, northeast China and east China.

Table 6. The nodal service-oriented tourist city and the third hierarchy.

City type	Ⅳ	Ⅴ	Ⅵ
Cluster nucleus	Zhengzhou Zhuhai Dalian Tianjin Ningbo Wuxi Nanchang Kunming Shenyang Haikou Harbin	Hefei Jinan Guilin Fuzhou Shijiazhuang Hohhot Changchun Taiyuan Huangshan	Nanning Guiyang Quanzhou Qinhuangdao Luoyang Nantong Zhangjiajie
Singular members			Lanzhou Urumqi Xining
Hybrid members	Taipei＞Ⅲ Suzhou＞Ⅲ Macao＞Ⅴ	Macao＞Ⅳ	Weihai＞Ⅶ Yantai＞Ⅶ
Near isolates			

4.4. The service-oriented tourist city on the edge and the fourth hierarchy

The fourth hierarchical arenas are generally included tourist cities with low tourism popularity in the current period (Tables 7). These cities are classified as “edge cities” in China's urban tourism service network. This “edge” is not because their geographical location is in a remote place, but most of them are not fully enjoy the development opportunities brought by network connection and are in an edge position of the network. This reflects the lowly and relatively isolated position of some ordinary tourist cities in the service-oriented tourist city network. These reflect the relatively isolated position and lowly status of some ordinary tourist cities in the service-oriented tourist city network. But this situation does not prove that they aren’t involved in process of tourism regionalization in urban tourism network. However, their connectivity in the network of service-oriented tourist cities in China is not high, some cities do not have a high degree of affiliation in the corresponding cluster and have less tourism connections with other cities, so they belong to the “near isolates” city such as Lasa and Jilin. Moreover, there are many hybrid members. Zhangzhou, Lianyungang, Weihai, Yantai, Zhongshan of the fourth hierarchical arenas as hybrid cities may be dissatisfied with the development level of tourism services, so they try to establish connections with cities in other cluster in order to improve their tourism service in order to change their edge position.

Table 7. The edge service-oriented tourist city and the fourth hierarchy.

City type	Ⅶ	Ⅷ
Cluster nucleus	Yinchuan Chengde Shantou Zhanjiang	Datong Beihai Jiujiang
Singular members	Wenzhou	
Hybrid members	Zhangzhou＞Ⅷ Lianyungang＞Ⅷ Weihai＞Ⅵ Yantai＞Ⅵ Zhongshan＞Ⅷ	Zhongshan＞Ⅶ Zhangzhou＞Ⅶ Lianyungang＞Ⅶ
Near isolates	Lasa	Jilin

The main reasons why cities at this level have not established good tourism service connections with other cities are:

First, they lack a competitive tourist attraction, some cities at this hierarchy have some traditional tourism resources such as sightseeing and worship, but lack of high-level tourism resources with strong attraction in current tourism services;

Second, the city functions are relatively backward and single, and the outsiders lack the necessity of entering the city.We found that the travel services of these lower-level arena members may be more regional, but their service area is not large. The cluster Ⅶ nucleus including Yinchuan, Chengde, Shantou, Zhanjiang and the cluster Ⅷ nucleus including Datong, Beihai, Jiujiang have their own relatively stable tourist service groups, and other stronger tourist cities have not formed fierce competition with the tourism services of these nucleus cities due to the cost of space distance[42] or lack of competitive tourism resources.

Finally, we find that Wenzhou, as an independent service-oriented tourist city, exists in the coastal area of southern Zhejiang Province. There is no strong service-oriented tourist city within 200 km around it. It mainly meets the demands of surrounding areas for tourism services. So, it is classified as a singular city. Generally speaking, the fourth hierarchy of tourist cities as the basis of the above three hierarchical arenas, it has an irreplaceable role, but this edge position may change with the construction of their tourism attractions, traffic improvement, and the change of city development strategy[6].

4.5. Arena gaps of regional geographies

These findings come from the analysis of the regional tourist city network in China. However, a famous "center-edge" theories are pointed out in the identification of city network arena. Next, we will analyze the regionalization of contemporary tourism flows how to promote the closer connections within cities in the specific region. This may impinge the long established regional "city network system", which is the traditional focus of tourism geographers in analyzing the relationship between various cities. Figure 1 depicts the "center-edge" structure in this network of China, which gives us some special information.

First, we can compare the location of the arena centered on China's three major economically developed regions. The major cities of East China centered on Shanghai are mainly in two hierarchical arenas bands (Shanghai is on the first hierarchy, Nanjing and Hangzhou are on the second hierarchy). The important cities of the South China centered on Guangzhou and Hong Kong are mainly distributed in three hierarchical arenas bands (Guangzhou and Shenzhen are on the first hierarchy, Hong Kong is on the second hierarchy, and Macao is on the third hierarchy). While the important cities in the North China centered on Beijing are mainly in two hierarchical arenas bands (Beijing is on the first hierarchy, Tianjin and Shijiazhuang are on the third hierarchy), its regional city system has no second-hierarchy city. These clearly shows that, compared with the "vertical" city relationship of the network of tourist cities in North China, the network of other two regions have a more reasonable "horizontal" city relationship. The good cooperation shows that the tourism service connection between various cities in these two regions has enabled most cities of the two regions to develop healthily and fully enjoy the benefits of regional service connection. Although this results

are not definitely a surprising, they are closely related to the connection of tourism regionalization. Beijing has adopted absorptive policies on the surrounding cities in urban agglomerations, so that the high-quality resources of urban service functions such as transportation, exhibition, education, medical treatment, high-end shopping in the surrounding areas are concentrated in the core cities. The other two regions pay attention to the spatial distribution of urban service functions in order to form complementary service resources among various cities. Clearly the development strategy of urban tourism service is of vital important for the relationship between the service function development of each city relates to the process of tourism globalization.

Second, in addition to China's three most important urban agglomerations, the southwest China represented by Chongqing and Chengdu, and the Central China represented by Changsha and Wuhan have a similar pattern of regional tourism service arena as the urban network system of South China. Both of them are represented as the regional tourism service network model centered on the binary star. Chongqing and Chengdu are the nucleus of cluster Ⅱ in the tourism network of South China. Changsha and Wuhan are the nucleus of cluster Ⅲ in the tourism network of Central China. In view of the fact that there are many tourist cities in the South China and Central China at the higher hierarchical arenas, this shows that the two regions have also gradually formed regional tourism connection clusters. However, this fact is more interesting in the distribution of the third and fourth hierarchical arenas: in the process of tourism globalization of the Southwest China, there seems to be a relationship between very important cities including Chongqing and Chengdu and tourist cities including Kunming and Guilin in the southwest region There is a large gap in service development, and this gap in development is growing in the current state. In fact, Kunming and Guilin were developed cities in China's early tourism service, but in the past decade or so, their tourism service competitiveness has experienced a relative decline. In the process of tourism globalization in Southwest China, there seems to be a big gap in tourism service development between nucleus cities and other tourist cities such as Kunming, Guilin, and the gap is getting larger in the current situation. In fact, Kunming and Guilin are the developed cities in China's early tourism service, but in recent years, their tourism service competitiveness has declined relatively. However, in the process of tourism service globalization in the Central China, the advantage gap between the two nucleus cities and other tourist cities such as Zhengzhou, Nanchang, and Hefei, is narrowing. At present, most of the cities in this region are showing a rapid upward trend, which means that under the incentive of tourism globalization, most cities in the tourism service arena in the service network of Central China are try to "move up in the network" and create a new Central China arena at a higher Hierarchy. This shows, on the other hand, most of the cities in the Central China can share the benefits brought by the arena connection and cooperation. On the whole, the two regions are similar in tourism service network. Chongqing and Chengdu in Southwest China are more developed than Changsha and Wuhan in Central China. However, the overall development level of Central China is more ideal. The reason for this gap is that the population size and urban functions of the nucleus cities in Southwest China are too concentrated, while most cities in the Central China have a large population size, and they are gradually improving the regional transportation system and tourism commercial service market.

Thirdly, the most attractive achievement of this paper is that it also lights shines on the erstwhile tourist cities which were easily neglected in the city network. The important viewpoint is that the urban tourism service competitive arenas in Northwest and Northeast China is well represented in the network beyond the main service regions. Taking Northwest China as an example, Xi'an and Hohhot are on a relatively important representative of tourism services. Both Dalian and Shenyang have gathered on a strong performance within Northeast China. At the same time, Hong Kong, Taipei, and Macao in the *Hong Kong, Macao and Taiwan regions China* all belong to hybrid city, indicating that their service network system is not limited to a single cluster, and because of their extensive influence, they will participate in multiple tourism service connections. It is worth mentioning that tourist cities such as Lasa and Jilin are in the network as near isolates members, in fact, they all have good tourism resources, such as the Tibetan cultural landscape of Lasa and the magnificent landscape of the Songhua River Rime in Jilin. The possible reasons for these are that Lasa

is geographically far away from cities in those relatively developed regions such as the East China, South China and North China, and the traffic accessibility of Lasa is poor. Jilin is a traditional industrialized city, and the local industry has declined, its urban function has not made significant relative progress in the past ten years.

5. Discussion and Conclusion

Based on Manuel·Castells' theory of flow space network [1], this paper enriches the theory of city position and classification in flow space network by using Fuzzy c-means clustering analysis. In addition, from GaWC's research [33], this paper develops an empirical method to study the formation of tourist city network. It improves the spatial structure theory of tourism geography in a relatively complete large national region, especially complements the "center-edge" theory. In this paper, we supplement the previous exploratory analysis of the service-oriented tourist city network, the main objectives are: on the one hand, the fuzzy spatial dimensions behind the formation of tourist cities are cleared up; on the other hand, try to describe the geographical details of the network, in order to illustrate geographical space is an important factor in the formation of the network.

The research specifies tourist cities as a city interlocking networks that we apply a regional holistic analysis of them in China. Our results obviously reveal the differences of connectivity and geographical distribution within the data, indicating the regional pattern characteristics and hierarchical tendencies distinctions of cities in the network. This hierarchical tendency and regional patterns show three conclusions of regional tourism connection network.

Firstly, China's four most important international cities as the center structure leads the whole tourism connection network, and their connectivity are all very high. As the first hierarchical cities, these four cities have formed a unique tourism arena, they all have their own unique urban functions, and their tourism services are difficult to be replaced by other cities. In terms of geographical distribution, they occupy the Northern, Eastern and Southern regions of China, this spatial layout can effectively connect them to more low-hierarchy cities in the geographical space. At the same time, we find that there is an obvious phenomenon in the interaction between hierarchical tendency and regional pattern, that is, clusters with low average connectivity are more restricted by regional forces in special region, and they have less influence on cities farther away. This geographical phenomenon further shows that a regional pattern is not only the location space of different clusters, but also represents the interaction results of various tourism arenas in the urban network with different hierarchical tendencies.

Secondly, the regional patterns show that East China, South China and North China are the three most important arenas of tourism service economy in China, but there are great differences in the configuration of arena. In North China, it is different from East China and South China in the following aspects: (1) there is a "vertical" structure of service connectivity in tourist cities, and there is no second hierarchy service-oriented tourist city. Beijing's comparative advantage and scale of service connectivity are far stronger than the surrounding tourist cities; and (2) in the process of tourism service globalization, high-quality urban functions are excessively concentrated in the nucleus cities. In contrast, the tourist cities in East China and South China have better service connectivity in whole, and their cities covering all hierarchies of arenas. The connectivity scale distribution structure of the two regions' tourist cities tends to be "horizontal", and tourist cities in East China do better. The two regions of Southwest China and Central China are similar in tourism service network, Chongqing and Chengdu in Southwest China are more developed than Changsha and Wuhan in Central China, but the overall development level of Central China is more ideal. At the same time, this paper shines on erstwhile “previously easily neglected tourist cities” in the service service-oriented tourist city network, the Northwest China and Northeast China are well represented in the network beyond the main service regions. Xi'an and Hohhot are on a relatively important representative of Northwest China’s tourism services, and Dalian and Shenyang have gathered on a strong performance within Northeast China.

Thirdly, the paper tries to improve our understanding of tourism regionalization by describing a new and detailed description of tourism connection network based on regional pattern. Instead of

limiting "region forces" to several major "international cities", but we incorporated a very large number of various tourist cities into a single integrated region to construct an analysis framework of urban tourism connections. The geographical distribution of contemporary tourism service globalization in the regional scope is not an end-product, but an important part in a series of continuous processes. This means that as the connectivity of the service-oriented tourist city network intensifies, the gaps had identified in the network will be filled up in the next few years. On the other hand, with the development of regional growth pole at the national level, the regional service industry of urban tourism may be more and more concentrated in a few important tourist cities, and the gap of tourism connection network may widen. Due to the rapid development of China's urban tourism, these hierarchical tendencies and regional patterns of the future tourism network should also change. In the face of such unknown changes, we should have a scientific understanding of the contemporary urban tourism network, otherwise we will not be able to evaluate these changes, nor can we timely and correctly update the strategies of urban tourism development in China.

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