Research on the Development Model of the Interaction and Integration of Tourism Space

Xuanyu Ren, Qijun Yang

Panzhihua University, Panzhihua 617000, China

Abstract

Tourism spatial interaction can reflect the characteristics of tourism spatial structure. Therefore, it is very important to carry out comprehensive evaluation and spatial analysis of tourist attractiveness of tourist resources in a single city. In this paper, the concept and characteristics of tourism spatial interaction are interpreted and then the structural analysis system of tourism spatial interaction is explored. Moreover, through tourist flow and ordinary passenger flow, the basic form of tourism spatial interaction is analyzed while its application is discussed. The complementarity, transferability and intervening opportunities of the basic conditions of spatial interaction are also analyzed. The integration model of tourism spatial interaction is analyzed from four aspects: the interaction intensity model, the economic relation model, the subjection model of tourist economy and the breaking point model. And then through the exploration of the characteristics of the spatial structure of tourism spatial interaction, the development of urban tourist industry is studied.

Keywords: Tourism Space, Interaction, Integrative Development, Model.

1. RESEARCH BACKGROUND

1.1 Literature review

The integrative development is the only way for the sustainable development of China’s tourist industry. In recent years, China has attached great importance to the integrative development of regional tourism from the perspective of policy and legislation. In the Opinions of the State Council on Accelerating the Development of Tourism, the integration of tourist resources management is considered as a major part of deepening China’s tourism reform. The principle of spatial interaction was first proposed by the American geographer E. I. Ullman, which refers to the exchange of material, energy, human resources and information between city and city, city and region in order to protect the normal operation of life and production. He also stated the three necessary conditions for the formation of spatial interaction: complementarity, transferability and intervening opportunities. Tourism spatial interaction is an objective existence and an important expression of spatial interaction. In addition to tourist flow, ordinary passenger flow, capital flow, information flow and technology flow have an evident effect on the regions which are both tourist destination and tourist source. The interaction means the mutual transmission of tourist elements among geographical objects, showing the tourist and economic connection between geographical objects through the spatial displacement of various tourist elements with spatial orientation (Dun, 2015).

1.2 Research purpose

This paper analyzes the basic conditions and basic forms of tourism spatial interaction and applies the modified model to calculate and analyze the interaction intensity and the attracting range of city. To a certain extent, the study has enriched the research results of tourism space interaction. Based on the analysis of the interaction, this study constructs the conceptual model of tourist integration under the view of gravitational area and widens the perspective of regional tourist integration. Through the analysis of the interaction, the directions of tourist economic contact between cities have been clarified. This research helps the cities in tourist demonstration areas to define their status, functions and development directions of tourist integration. Through the construction of tourism space integration, the pattern of tourism spatial integration between regions can be gradually formed. Under this pattern, a pathway of tourist integration can be developed based on optimized distribution and convenient circulation of tourist elements (Lu and Bao, 2012). This is of practical significance to promote tourist integration.
2. BASIC FORM OF TOURISM SPATIAL INTERACTION

2.1 Tourist flow

The basic form of tourism spatial interaction in city is shown by various tourist elements, including tourist flow, ordinary passenger flow (including tourists flow), capital flow, information flow, technology flow and so on. The first two elements are its major expression. To a certain extent, it shows that the intensity of the interaction of the region with others provinces is greater than that within a province; the boundaries of tourist industry can be expanded during the promotion of traditional tourist industry towards a tourism characterizing sightseeing and experience. Agriculture, commerce and other industries that are related to tourist projects can be further expanded through the extension of the tourist chain, cultivation of new tourist forms, increase of tourist supporting industries, promotion of the crossover and integration of sports. In implementation, attention should be paid to the differences between various industries so that adjustments according to the regional economic advantages can be made (Bi, 2007). For example, in Anhui Province, Wuhu City can integrate animation industry into tourist industry, Huangshan City cultural industry, Hefei City science and technology education, Chizhou City Buddhist culture, Anqing City entertainment business, Xuancheng City sports industry, Tongling City industry and Bozhou City Chinese medicine. The development model of “tourism + X” can be used to promote the growth of regional economic effect. Different growth advantage does not mean that the spatial interaction between city and other places within the province is weak but that its proportion appears to be smaller compared to the huge source from other provinces. The tourism spatial interaction is shown in Figure 1.

Figure 1. Tourism spatial interaction

2.1 Ordinary passenger flow

Ordinary passenger flow is mainly shown by annual passenger traffic (the quantity of passengers actually transported by various modes of transportation in a region). This indicator, reflecting the quantity of transport industry serving for the national economy and people’s life, is an important index to study the development scale and speed of transportation. In some areas, the dense population, the good transportation network and the developed regional economy result in large ordinary passenger flow and close inter-city links. According to the linear comparison between regional economic and tourist development, the mutual promotion relationship between the two can be discovered. Based on the promotion of economic growth, a diverse tourist products system can be created with components of relaxation, sightseeing, culture, ecology, village, revolution and urban area (Wu, 2008). The experience consumption of modern tourists, as well as their personalized and diversified needs, should be realized so that corresponding tourist products should be developed according to regional characteristics. Meanwhile, projects of tourist experience extension focusing on recreational traveling with cultural characteristics should be set up. A tourism with strong recreational characteristics, unique
cultural characteristics, elaborate sightseeing characteristics and excellent specialized features should be developed together with new tourist products for different aims such as recreational tour, cultural experience, health care and sports, ecological sightseeing, self-driving tour and conference tour so as to raise the social and economic status of tourist industry. During the promotion of diversified tourist industry, the establishment of tourist culture according to regional characteristics will be beneficial to better brand effect and the steady growth of regional economy.

3. BASIC CONDITIONS OF SPATIAL INTERACTION

3.1 Complementarity

Complementarity is the result of the uneven distribution of regional production factors. When the remaining elements of a region are the necessary ones of the other region, the complementarity of the two regions in this aspect leads to the interdependence of regional economic relationship. The formation of each city is based on its natural characteristics. The humanistic philosophy and urban spatial structure of a city are gradually formed and developed when people establish their production model and lifestyle based on its natural characteristics. Tourism spatial interaction is a realistic carrier of the city's humanistic philosophy, representing and transmitting a kind of cultural connotation. Modern tourist industry develops no longer simply based on natural scenery or other products of material civilization but taking tourist resourcesthemselves as the objects through deep-level cultural excavation or packaging for more practical value and then converted them into real benefits. This trend of development and its result are irreversible and irreproducible (Ren, 2016). The unique regional characteristic has become the primary feature of tourism spatial interaction because the uniqueness of tourism resource is an important manifestation of its value. The complementarity of different regions can only exist when there are differences in regional resources, which constitute the realistic basis of spatial interaction. The complementarity of spatial interaction is shown in Figure 2.

![Figure 2. Complementarity of spatial interactions](image)

3.2 Transferability

Transferability refers to the possibility of the circulation of merchandise, capital, population, technology, information, etc. in different regions. It is affected by four factors: the distance of time and space between regions; the economic distance of the object to be transmitted; the political, economic, cultural and social barriers in region; with the accumulation of social material wealth and the diversification of social thoughts, a city is not merely a combination of people’s production and life. Its cultural nature is more and more obvious and important (Hou and Xie, 2015). There is liquidity of traffic in different regions, too. The value of tourism spatial interaction is mainly manifested in its uniqueness which is based on the differences in spatial contrast. So the interaction of each space is caused by its own uniqueness with the attractiveness of fixed orientation. Tourists choose or refuse a destination due to the same reason - the uniqueness of tourism spatial interaction. Each tourist will choose their destination due to their specific needs so tourism spatial interaction is only influential to targeted tourism groups. Generally, a shorter the spatial distance between regions means a smaller the economic distance of the transmission object while smaller the political, economic, cultural and social barriers between regions
mean a greater the transferability of interregional traffic (Zhou and Xu, 2015). Tourism attraction depends on the value of tourist resources as shown in Figure 3.

Figure3. Tourist resources development value

3.3 Intervening opportunity

The concept of intervening opportunity was first proposed by Scitovsky, meaning that the intervention of other regions leads to the intervening opportunity with the possibility of spatial interaction. City itself is the core area of people’s social activities so that it will develop with the social and economic development and the progress of spiritual civilization and cultural ideas. Tourism spatial interaction will develop naturally and reflect the progress of urban humanities and urban material civilization (Wang, 2017). The development of urban humanities turns it into tourist resources with integrity, systematicness and value of development. Therefore, tourism spatial interaction is two facets of a problem. The integrity of a city constitutes an independent tourist resource while the dependent units in the urban system create tourism spatial interaction because of the systematicness of a city. People will take the initiative to transform and innovatetourism spatial interaction as well as enrich it. The reason for the chances of intervening opportunity is complementarity but its occurrence depends on the intensity of the complementarity between regions (Han, 2014).

4. Integration model of tourism spatial interaction

4.1 Interaction intensity model

The idea of measuring the intensity of spatial interaction is derived from Newton’s law of universal gravitation. The gravitational model constructed by Newton’s law of universal gravitation and the principle of distance decay can be used to measure the intensity of spatial interaction between geographic objects. The formula of spatial interaction intensity model is: 

\[ W_{pq} = \frac{D_p D_q}{S_{pq}} \]

where \( W_{pq} \) is the intensity of tourism spatial interaction between two cities \( p \) and \( q \); \( D_p, D_q \) are the tourist quality of the city \( p \) and \( q \); \( S_{pq} \) is the traffic distance between the two cities. Spatial interaction intensity refers to the distribution of tourism spatial interaction in the same city. The analysis of the average tourism spatial interaction index can provide important reference to the development direction and design of tourism spatial interaction so that dominant tourism spatial interaction can form a systematic and scientific coordination relationship for maximizing economic and social benefits. According to the average tourism spatial interaction index, areas with bigger attraction can develop more attractive tourist routes, which may bring higher tourist and economic value (Lu, 2013).

4.2 Economic relation model

Economic relation model is used to measure the intensity of tourist and economic relation between cities on the basis of the improvement of spatial interaction model. In \( I_{pq} = \frac{\sqrt{A_p B_p} \sqrt{A_q B_q}}{S_{pq}^2} \), \( A_p, A_q \) represent the total number of domestic tourist of city \( p \) and city \( q \); \( B_p, B_q \) represent the total domestic tourist revenue of the two
cities $Z_{pq}$ represents the intensity of tourist and economic relation between the two cities. Through calculation, the correlation between tourist resources and tourism spaces can be checked which means to check whether there are positive correlation and mutual influence between tourist resources and other factors including spatial interaction. Contract to the positive correlation, tourist resources are affected by the external environmental factors and generate changes into tourism spatial interaction (Zhu, 2010).

### 4.3 Subjection model of tourist economy

The comparison index of tourist and economic relation between regions is a relative indicator, which reflects the tourist attraction and radiation of the higher level cities to the lower level cities. $InH_{pq} = \frac{T_{pq}}{\sum_{q=1}^{t}T_{pq}}$, $H_{pq}$ represents the subjection of tourist economy of city $p$ to city $q$. The tourist attraction of a city is a relative concept that has a combined effect of a tourist city to the tourist elements of another city. It can be measured through the breakpoint model $\frac{E_{MN}}{(1+M_{N})}$. The formula $G_{M} = A_{M}B_{M}$ and $C_{N} = A_{N}B_{N}$ show the tourist development scale of city $M$ and city $N$ respectively. Regional or urban tourist functions can be categorized by calculating the tourism centrality index and measured by tourist resources, economic and so on. In

$$G_{E_{q}} = \left(\sum_{j}^{E_{q}} \cdot E_{q}, R_{q}, T_{q}\right)$$

represent the total score of tourist resources of city $j$. $InG_{i_{q}q_{i}} = \frac{\sqrt{E_{q}T_{q}}}{\sum_{q=1}^{t} \sqrt{E_{q}T_{q}}}$ and

$$G_{V_{q}} = \frac{G_{E_{q}}G_{R_{q}}G_{G_{i_{q}q_{i}}}G_{G_{a}B_{q}}}{A}, G_{V_{q}}$$ means tourism centrality index (Shaw, 2008).

### 4.4 Breakpoint model

Converse proposed the breakpoint concept in 1949 and gave the formula to calculate the breakpoint of the two regions. After a series of research and experiments, the model of tourist breakpoint was constructed to measure the range of regional tourist gravity, which reflected the distribution of potential tourist market in the region (Bian, 2007) and determined the boundaries of the tourist attraction area. The formula is

$$Y_{p} = \frac{Y_{pq}}{(1+\sqrt{K_{p}/K_{q})}}$$

$Y_{p}$ is the attraction scale of city $p$; $K_{p}, K_{q}$ are the tourist development scale of city $p$ and city $q$. In the practical application of $\frac{K_{p}}{K_{q}} = \frac{(A_{p}/B_{p})}{(A_{q}/B_{q})}$, there are large limitations because the scale of a region’s tourist development does not fully reflect the tourist attraction of the region. For example, if tourists make their decision based on the careful study of the tourist resources, reception conditions and tourist traffic conditions of the destination, the tourist development scale of the destination does not necessarily have an influence on their decision-making (Wu, 2009).

### 5. Conclusions

With the acceleration of urban and rural economic integration, the development of tourist resource is faced with new challenges and new competitions among cities. With the development of tourist environment and the improvement of tourist infrastructure, the development of tourism spatial interaction has become an objective need of tourist development of cities. Based on the analysis of the spatial interaction and spatial structure characteristics of tourism, the integration model of tourism spatial interaction is divided into four types: the interaction intensity model, the economic relation model, the subjection model of tourist economy and the breakpoint model (Yin, 2003). The study of the relationship between tourism spatial interactions can define the influence dimension of tourism influence. The study of the important objective factors can lead to a comprehensive understanding of the subjective and objective factors of tourism so as to achieve a scientific and sustainable tourist development.

### REFERENCES


Han J.J. (2014). Study on the positioning of Wuhan urban tourism circle in the development of tourism integration of middle triangle, Huazhong Normal University.


Shang X.M. (2012). Research on regional economic integration of Beijing, Tianjin and Hebei based on spatial structure of tourism flow, commercial age, (21), 138-139.


