

Study on the Family Relation Network of Kaifeng Jinshi Group in the Northern Song Dynasty Analysis Based on the Combination of CBDB Database and Traditional Historical Records

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ABSTRACT

The combination of big data and historical textual research has become one of the hotspots of historical research in the new era. The combination of CBDB database and related visualization software provides another feasible path for studying the relationship network of ancient historical figures and the regionalization of imperial examinations. CBDB and traditional historical records show that the family relationship of Kaifeng Jinshi Group in the Northern Song Dynasty has some characteristics. The family relationship network of Kaifeng Jinshi Group formed a whole pattern with some big families as the center and some small families scattered on the edge. In-law relationship is an important link to maintain the connection between imperial examination families. The rise of the southern Jinshi group accelerated the deconstruction process of the Kaifeng Jinshi group family. When using big data for imperial examination research, attention should be paid to the application of traditional textual research methods to ensure the accuracy and reliability of relevant research.

Keywords: Kaifeng Jinshi Group; Imperial examination; Family network; CBDB database; the Northern Song Dynasty

1. INTRODUCTION

The imperial examination system was an important method of selecting officials in ancient China, and its evolution influenced the development of traditional Chinese politics and culture. Jinshi was the most important subjects in imperial examination, which was usually the main way for senior imperial officials. Song Dynasty is a period of continuous development and perfection of Chinese traditional imperial examination system. The quantity of Jinshi admissions increased rapidly after the second year of Emperor Taizong's Taipingxingguo (977). [1] The admission scale reached its peak in the late Northern Song Dynasty. [2] China has a vast territory. Limited by historical data, it is inconvenient to carry out relevant statistics. It is impossible to observe the regional characteristics of the imperial examination system intuitively. It's also impossible to understand the phased characteristics of the development of the imperial examination system from specific details. Is there an effective solution to the above problems?

Traditional historical research results have laid a foundation for the introduction of big data into the imperial examination system. Some scholars are beginning to use big data to carry out historical research. Xu Yongming took Tang Xianzu's research as an example to explore the possibility of using *the China Historical Geographic Information System* (CHGIS) and *the China Biographical Database* (CBDB) for literary visualization research. [3] Peter K. Bol used CHGIS combined with CBDB to explain Chinese traditional Confucianism. [4] Liu Jingchen explained a new way of using big data to study Jinshi families in Ming and Qing Dynasties with CBDB and *Zhonghua Root Seeking Network*. [5] Qian Chaofeng and Du Debin analyzed the bureaucratic family network data of the Northern Song Dynasty through the relational data of CBDB database, combined with the geographic information data of CHGIS and *the Chinese Civilization in Time and Space* (CCTS). They pointed that the family network of Northern Song Dynasty was huge. But the connection was sparse, the core family was few, part of the core family was dominated by the bureaucratic network, and

the highly concentrated and centralized family network had a trend of gradual deconstruction. [6] Pan Jun's research aiming at the combination of CBDB database and traditional ancient books, discussed the auxiliary role of introducing research network representation learning into historical social network analysis in human data mining and problem discovery. [7]

Although the above studies indicate that big data analysis can only be used as an auxiliary method in the process of humanistic research, its role in promoting traditional history cannot be ignored. The application of big data can make up for the shortcomings of traditional research methods. It is feasible to combine the CBDB database with ancient books to study the regional characteristics of the imperial examination system. With the help of the CBDB database, this paper takes the Kaifeng Jinshi group in the Northern Song Dynasty as the main research object, and explores the overall characteristics of the development of the imperial examination system at various stages in this region.

2. DATA SELECTION OF KAIFENG JINSHI GROUP IN THE NORTHERN SONG DYNASTY

2.1. Determination of the research phase

When collecting data, the time limit that has been proven in the history study should be highlighted. The current academic circles regard the first three dynasties of the Northern Song Dynasty as the early stage, the period from Song Renzong to Song Shenzong as the middle, and the period from Song Zhezong to Song Qinzong as the late stage. In the second year of Emperor Taizong's Taipingxingguo (977), the government decided to expand the scale of imperial examinations in order to stabilize the political situation. [8] Therefore, this article divides the study period into four parts, namely 960-976, 977-1022, 1023-1085, and 1086-1126. However, because the data volume during the period from 960 to 976 is relatively small, it is attached to the period from 997 to 1022 for analysis.

2.2. Data integration

In the CBDB database, we need to use the "look at entry" option to limit the entry condition to "Jinshi (general)". When choosing a region, we should pay attention to the way of marking the location in the CBDB database. Although the data in CBDB reflects the general situation of the evolution of political districts in the historical period, it is somewhat confusing when we select data. We must choose Kaifeng as a Fu-level administrative district, and avoid Kaifeng County. According to this condition, there are a total of 124 pieces of relevant person information in the CBDB database. Refer to Figure 1 for the amount of data at each stage.

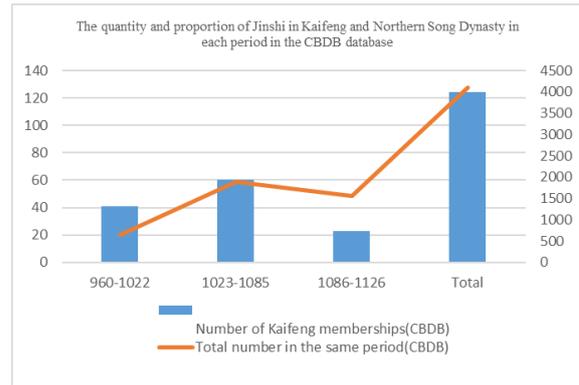


Figure 1 The quantity and proportion of Jinshi in Kaifeng and Northern Song Dynasty in each period in the CBDB database

However, 37 of the 124 pieces from the CBDB database contained errors in the records of the people's territories, including Ouyang Xiu (Jizhou Yongfeng), Wang Gui (Shuzhou) and others who mistakenly classified their territories in Kaifeng. In addition, the "General Records of Dengke in the Song Dynasty" and related historical records were inspected. Another 23 Kaifeng's scholars were omitted or classified into other regions, such as An Tao and Han Zongdao. [9] The revised data are shown in Figure 2.

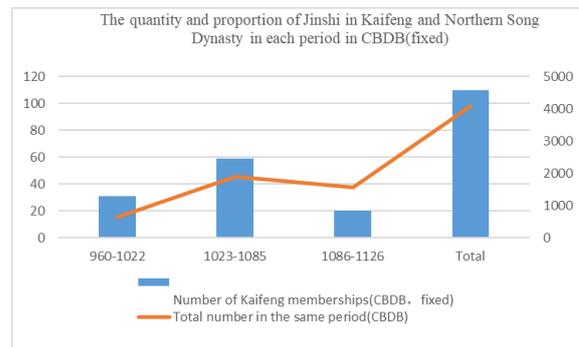


Figure 2 The quantity and proportion of Jinshi in Kaifeng and Northern Song Dynasty in each period in the CBDB database (fixed)

Related research provided that the total number of Jinshi students in each period of the Northern Song Dynasty was 4477, 9981, and 9868 respectively. The revised CBDB data set has a large deviation from the current number of people counted by history books. This gap reaches 5-7 times. We take the scholars who passed the imperial examination as a whole in history, and the character data collected by the CBDB as a sample drawn from the whole. Assuming that there is a certain proportion of people who can be verified in each state, and they were all collected in the CBDB database, then this data can be considered to have a high degree of reliability. The revised CBDB data set basically fits the overall trend of the development of imperial examination candidates during this period. Compared with the mid-North Song Dynasty, the data decreased in the late Northern Song Dynasty, which is also related to the

historical documents handed down from the Northern Song Dynasty. Although there may be discrepancies in numbers, the discrepancies are mutual. The proportion of Kaifeng-born Jinshi to the total number in the Northern Song Dynasty in the same period should be roughly accurate. Why did the proportion of Kaifeng Jinshi drop sharply in the late Northern Song Dynasty? This in turn requires specific observation and analysis with the help of visual presentation of data and other auxiliary data.

3. VISUALIZATION OF THE KINSHIP NETWORK OF KAIFENG JINSHI GROUP

3.1. Visualization of data sets

Import the obtained data into the CBDB database "query social networks", click kinship, and set the distance limit to 1 (direct contact with Jinshi and the first person), and get the kinship data of Kaifeng Jinshi group at each time period set. Import these data sets into Gephi separately to get a visualized network map. See Figure 3 for details.

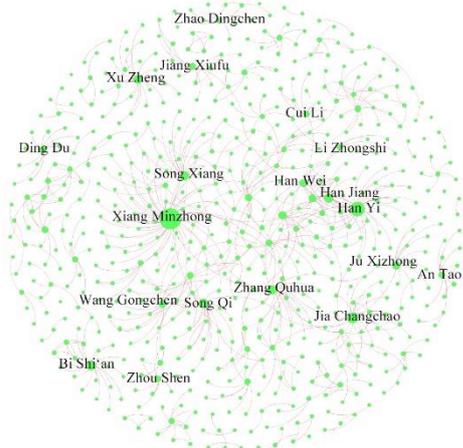


Figure 3 The kinship network of the Jinshi group in Kaifeng (960-1126)

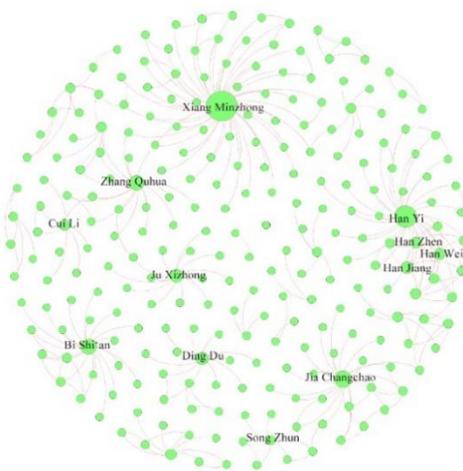


Figure 4 The kinship network of the Jinshi group in Kaifeng (960-1022)

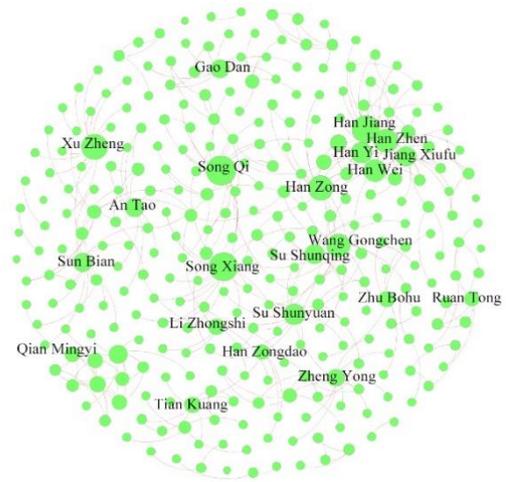


Figure 5 The kinship network of the Jinshi group in Kaifeng (1023-1085)

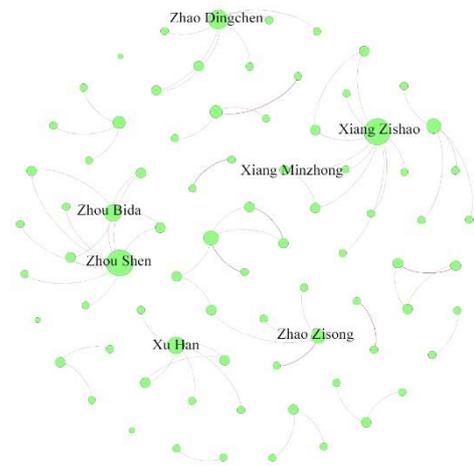


Figure 6 The kinship network of the Jinshi group in Kaifeng (1085-1126)

The entire relationship network is composed of several large families living in the center and several small families scattered on the periphery. On the whole, these big families include the Han Yi, Han Jiang, Xiang Minzhong, Jia Changchao, Bi Shi'an, Song Qi, and Song Xiang families. They formed the unique ecology of the network of scholars in Kaifeng Prefecture, indicating that a considerable number of scholars' homes were formed in Kaifeng during the Northern Song Dynasty. How about the situation at each stage of this period? Figure 4-6 shows the kinship map of the Kaifeng Jinshi group in each period of the Northern Song Dynasty, from which we can see the evolution of this group in the Kaifeng area during the Northern Song Dynasty.

3.2. Analysis of the relationship map

The above four relationship maps show that the Kaifeng Jinshi group in the Northern Song Dynasty formed a relationship network with several large families as the center and several small families scattered on the

periphery. This kind of relationship network has its own characteristics in different periods, showing the characteristics of dynamic evolution.

Firstly, according to Figure 4-6, the large families of the Northern Song Dynasty were basically formed in the early and middle stages, such as Xiang Minzhong, Han Yi, Jia Changchao, Bi Shi'an, etc. in the early stage, and Song Qi, Song Xi, Han Jiang, Han Wei, and Wang Gongchen and other families in the middle stage. The Kaifeng Jinshi family in the late Northern Song Dynasty was slightly weaker. This is related to the lack of historical records. Also, the North-South dispute on the imperial examination caused the "south-north change" of the proportion of candidates in the imperial examination in the early Northern Song Dynasty. [10] It led to the gradual deconstruction of the northern Jinshi family group. Figure 7 shows the difference in the number of jinshi in Kaifeng and Jiangnan East Road during the same period.

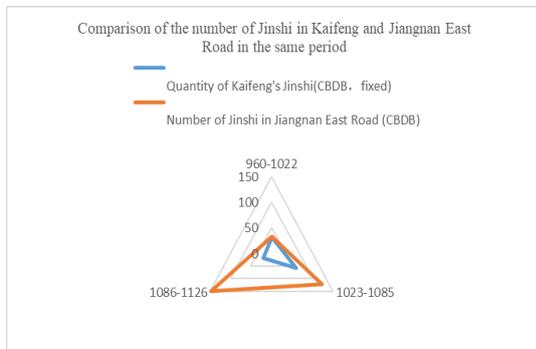


Figure 7 Comparison of the number of Jinshi in Kaifeng and Jiangnan East Road in the same period (960-1126)

Figure 7 points out the difference in the number of Jinshi in Kaifeng and Jiangnandong Road in each stage of the Northern Song Dynasty. The Jiangnan Donglu Jinshi included in the CBDB database first appeared in 980. After that, its proportion in the total number of Jinshi groups has gradually increased, which is consistent with the regional development characteristics of politics and culture in the Song Dynasty. This also reveals the regional characteristics of the deconstruction of the Jinshi family. The deconstruction of the Jinshi family in the northern region and the rise of the imperial examination family power in the southern region unfolded simultaneously. The overall deconstruction could not deny the rise of imperial examination families in some regions. [6] Figure 8 shows that at the time of the deconstruction of the Kaifeng Jinshi family in the late Northern Song Dynasty, the Jinshi family of Jiangnan East Road showed a trend of gradual prosperity, and showed the overall characteristics of "a few large families as the center, and several small families scattered on the edge".

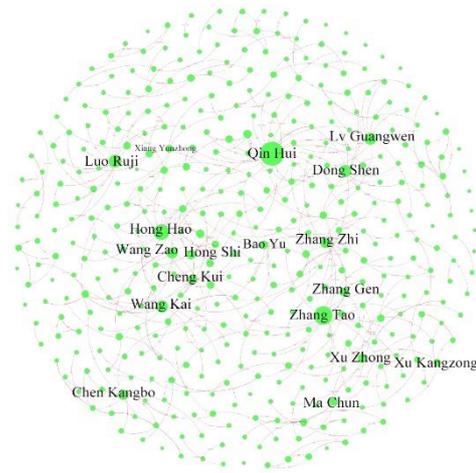


Figure 8 The kinship network of the Jinshi group in Jiangnan East Road (960-1126)

Secondly, Figure 3-6 also reveal that due to the gradual decline of northern power, most of the Kaifeng Jinshi families did not have inheritance in the Northern Song Dynasty. The imperial examination families in Figure 1 mostly appeared in the early and middle stage of North Song Dynasty. Among them, only the Yongqiu Han family both had Jinshi in the early and mid-North Song Dynasty. As a whole, it is related to the gradual deconstruction of the northern imperial examination society in the Northern Song Dynasty.

Finally, the imperial examination families generally had relatively close ties, and marriage became the bond of the regional family relationship, which promoted the polarization of the family in the region. Figure 3-6 reveals that marriage is the link between two or more imperial examination families. Xiang Minzhong was the son-in-law of Zhang Quhua, Song Yanzhao, and Wang Shenqi. It formed a huge network of relationships centered on Xiang Minzhong, which to a certain extent restricted the movement of social strata in the Northern Song Dynasty. However, the characteristics of the imperial examination system determine that the effect of such restrictions is limited. The movement of social classes brought about by the imperial examination system finally broke the geographical restrictions of imperial examinations and accelerated the southward shift of the political and cultural center of gravity in the Song Dynasty.

4. CONCLUSION

In the Northern Song Dynasty, the family relationship network of the Kaifeng Jinshi group showed the characteristics of several large families as the center and several small families scattered on the periphery. Due to the development of the imperial examination system in the early and mid-North Song Dynasty, the scale of Kaifeng Jinshi group expanded, and the quantity of Jinshi families was relatively large. However, with the rise of

the southern Jinshi groups in the middle and late stages, the imperial examination society in the northern region, represented by Kaifeng, began to show a trend of deconstruction. This was the inevitable result of the gradual southward shift of the economic and cultural centers of China in the Middle Ages. The maintenance of the regional imperial examination society relied on the maintenance of the marriage relationship between the Jinshi families. Although it promoted the rise of the Jinshi families to a certain extent, it did not completely block the flow of various social classes. The movement of social classes brought about by the imperial examination system finally broke the geographical restrictions of the imperial examination, which in turn accelerated the southward shift of the political and cultural center of gravity in the Song Dynasty.

Although the CBDB and related visualization software provide great convenience for the above conclusions, how to ensure the accuracy and reliability of the data when using big data for similar research is still an issue that cannot be ignored. When using the CBDB to conduct research on Jinshi family in a certain period of time or in a region, problems such as inaccurate matching and multiple repetition of fields are often encountered. [5] However, this is far from the most serious problem it is currently facing. Data entry people's judgment on the attribution of relevant personnel or entry errors often lead to serious data deviations and lead research to the wrong path. When conducting related research with the help of CBDB, necessary literature research is still an indispensable step. Only research on the basis of ensuring the accuracy and reliability of big data can be closer to the historical reality.

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