The Research Process and Prospect of Music Geography in China—Based on Citespace by Visual Analysis

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Abstract: This article is based on 798 articles about music geography in CNKI (China National Knowledge Infrastructure） from 1980. The bibliometric software called CiteSpace is to do visual analysis on core authors, core institutions, key words, etc. in this field. These results show that(1) since 1980, the researches can be distributed into three stages: the embryonic stage (1980-1997), the developing stage (1998-2007) and the rising stage (2008 to 2019). (2) the core authors are mainly Cai Jizhou, Feng Guangyu, Ma Da, Miao Jing and Qiao Jianzhong, etc.; (3) In the frontier aspect, "Rheology" and "inheritance" would be the hot research in the next few years. With the help of software, music database and GIS will be used in the research of MG.

1. Introduction

Music geography (MG) has been as a branch of cultural geography since 1980s. From that time, the music discipline involved with music geography has been paid much attention and has been a lot developing. Therefore, more researchers in China influenced by the developing music geography started to focus on this field. MG is a discipline based on the theory of "relationship between sound (music) and ground (geography), which explores the spatial distribution, change, diffusion of various musical phenomena (mainly about types of traditional music) as well as the formation and development of regional characteristics of human musical activities. (Qiao Jianzhong,2012)

In the past 40 years, MG had its own developing process and the key researches. Although some researchers have made some reviews of MG(Shen Qia, 1990; Miao Jing, 1993; Cai Jizhou, 1999; Wang Yaohua, 2003; Wang Yaohua, 2008; Zhang Xiaohong et al., 2011; Huang Hu, 2016), their publication time was before 2016 and these papers only showed researches by plain text. It is noticeable that most researchers did not use detailed graphs or tables to support their analysis.

In this article, we will analyze published literature before 2020, and with the help of the bibliometric software called CiteSpace, we will do a visual analysis. The relevant literature of "music geography" published in the past 40 years will be sorted out, counted by data mining. Knowledge Graph will be drawn through literature, the aspects of core authors and core institutions. Key words in this field can be done by network relationship analysis to reveal the track and generalizations of music geography, which is helpful for researchers to grasp changes and development trends of researched on-music geography.

2. Data sources and research tools

2.1 Data source

The research data used in this article is from CNKI. On the one hand, because the field involved in this article covers a variety of different topic names, we used the function of advanced search in CNKI, to select topics, keywords, titles or abstracts as the retrieval way to ensure the integrity of search results. On the other hand, in some articles, MG is only a part of the main contents, so the relevant words in this field will not appear in the topic, title, etc.. Therefore, it is necessary to pay attention to the citation relations of the literature and look for the literature that may be missed in

document retrieval. The range of retrieval time is defined in last 40 years (1980-2019). Meanwhile, in order to avoid the phenomenon of partial repetition caused by multiple retrieval conditions, we used a way of artificial recognition to do de-duplication, and delete the conference records, award-winning news, etc.. Finally, a total of 798 effective articles are used in this study. Table 1 shows the procedures of literature selection in details.

Table 1. the details procedure of literature selections

database	journal database in CNKI
Retrieval mode	The search of topic, keywords, titles or abstracts Citation and references of related literature
Search terms	Music Geography; regional music; cultural geography and include music; folk songs and include geography or color area; evolution (origin); homology
time range	1980-2019(40 years)
Effective articles	798 articles

2.2 Research tools

CiteSpace is a software that needs to run in a Java language context, which is based on the theory of Co-Citation analysis and the routing algorithm to analyze literature in the field.

The software can plot a series of visualization atlas to analyze the potential dynamic mechanism of discipline evolution and explore the development of frontier of discipline development(Chen Yue et al, 2015). In this article, we mainly used the methods of node threshold, time threshold and pruning algorithm of network in CiteSpace to do visualization researches.

3. Research situation of MG

3.1 The trend of literature quantity

798 articles analyzed in this study are from recent 40 years (from 1980.01.01 to 2019.12.31). The first article about "music geography" was published in 1980. (Yang Kuangmin,1980)

As illustrated in Figure 1, the researches can be distributed into three stages. It’s remarkable that from 1980 to 1997 (the embryonic stage), the number of articles published in this field was relatively small, 56 articles were published within 18 years, which means approximately 3 articles per year published on average, and the field was in the bud; from 1998 to 2007 (the developing stage), the field developed rapidly, 124 articles were published within 10 years, which means approximately 12 articles per year published on average; from 2008 to 2019 (the rising stage), it was the rising stage of the development in this field. 617 papers were published during the period of 11 years, on average, approximately 56 articles were published every year, and the peak was reached in 2016,81 articles were published in this year.

According to the annual trend of the number of publications in this field, the research of "music geography" shows a linear growth trend. In recent three years, the number of publications in this field has marginally declined, indicating that the development of the field shows a rising trend in fluctuation.

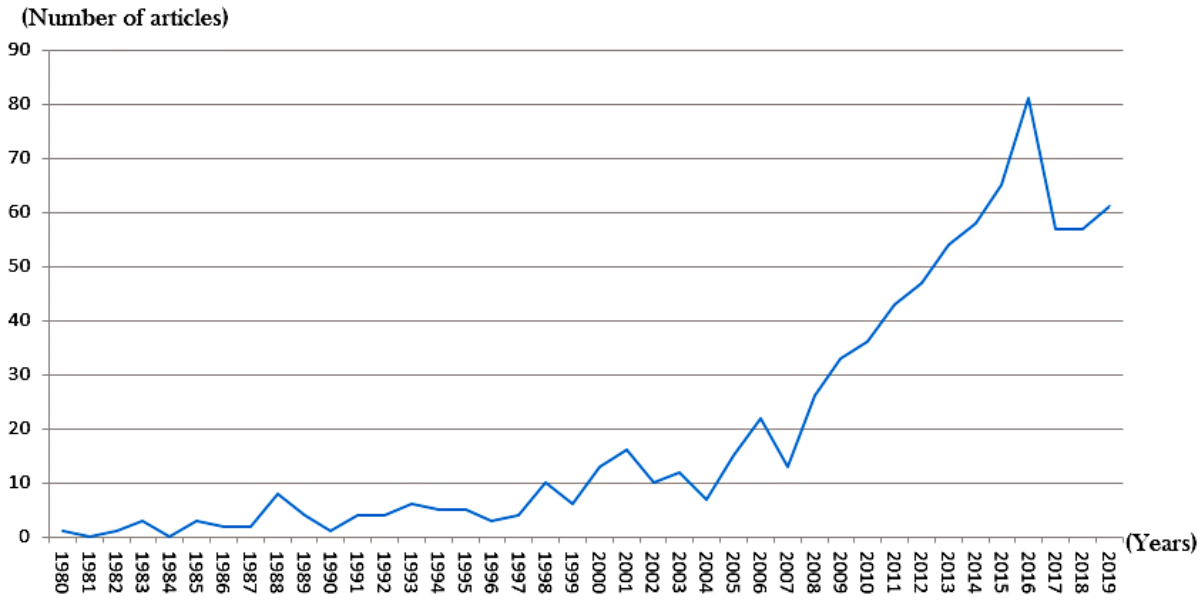

Figure1. Frequency of GM articles published between 1980 and 2019.

3.2 Analysis of core authors

Because the core authors are the backbone to promote academic innovation and developmental discipline (He Ruoyang, 2016), it is significant to analyze the core authors, referring to the researchers who have written many articles in the field.

Derek J. desolla price (1922-1983), an American scientist, once came up with the "price law" to measure the distribution law of core authors in various disciplines. According to the "price law", we can know that Price's law pertains to the relationship between the literature on a subject and the number of authors in the subject area, stating that half of the publications come from the square root of all contributors, so as to determine the core authors in this field, namely (Travis Nicholls,Paul,1988):

$$m = 0.749\sqrt{n_{max}}$$

M is the lowest number of core authors, and n_{max} is the number of articles that core authors wrote in this field.

Professor Cai Jizhou is as known that the most prolific author in the field of MG who published 21 articles in total. Based on the “price law”, we can analyze the core authors published at least 4 articles.

We use Knowledge Graph in the CiteSpace to analyze core authors visually. In the parameter setting, the time span was set as "1980-2019", "time slice" was set as 1, "node type" was selected as "author", topN = 50, and then we drew a knowledge graph of core authors for next step of analysis.

As showing in the Knowledge Graph, each node in the knowledge graph represents the name of a core author. The size of the node represents the number of articles published by core authors. The larger the node means that the author published more articles. The lines between nodes represent the co-occurrence relationship between core authors, which means there are articles published in cooperation. The coarser the line is, the stronger the co-occurrence relationship is. According to the retrieval literature data, the knowledge graph of the core authors in the field was drawn in Figure 2.

Figure2. The core authors of GM research

In Figure 2, the researchers named Cai Jizhou, Feng Guangyu, Ma Da, Miao Jing, Liu Zhengxiong published more articles. Between the core researchers, there are a few lines between nodes, including between Miao Jing and Qiao Jianzhong, Cai Jizhou and Xiang Wen indicating that they have ever cooperated.

It can be seen from the analysis of the atlas that although there are some core researchers who cooperated with each other, the number of cooperated articles are very few, the research status is relatively independent.

4. Analysis and prospect of the frontier of MG in China

In order to better identify the latest evolution of discipline research and predict the development trend of the research field, we analyzed the changes of the number of words or phrases that represent the content of research (Barnett j., 2003). Research frontier is regarded as "the most potential, latest and advanced research field or research topic in scientific research" (Chen Shiji, 2003). Based on the burst term, we did a statistical analysis of the research frontier to detect the changes and future trends of discipline development using the method of burst detection in CiteSpace. The threshold was selected as Top50, and the γ- value was set as 0.68. Then, the strongest citation bursts of top20 of MG were shown in Figure 3.

Among them, keywords in Figure 3 was the specific name of top20 bursts, "Year" represents the year when each keyword is first shown and all of which is 1980; "Strength" represents the intensity; "Begin" and "End" correspond to the red line on the right, indicating the year when each keyword begins and the year when it ends. For example, the keyword "Song species" means that the year of keyword lasted from 1983 to 1995.

Keywords	Year	Strength	Begin	End	1980 - 2019
歌种(Song category)	1980	2.6351	1983	1995	
诗歌(Poetry)	1980	2.5662	1994	2000	
传播 (Dissemination)	1980	3.5674	1999	2006	
音乐 (Music)	1980	3.8298	2001	2006	
民歌 (Folk song)	1980	11.973	2003	2013	
中国民歌(Chinese folk songs)	1980	2.6412	2006	2007	
流变 (Rheology)	1980	2.5971	2008	2019	
色彩区 (Color zone)	1980	2.6835	2008	2015	
中国传统音乐 (Chinese traditional music)	1980	4.28	2008	2015	
比较 (Comparation)	1980	3.1109	2008	2010	
传统音乐 (Traditional music)	1980	3.6221	2008	2019	
差异 (Difference)	1980	2.9032	2009	2012	
音乐文化(Music culture)	1980	4.1408	2010	2019	
区域音乐 (Regional music)	1980	10.8117	2010	2019	
区域文化 (Regional culture)	1980	5.9548	2012	2019	
地域文化 (Regional culture)	1980	2.7707	2012	2019	
地域性 (Regionalism)	1980	3.197	2012	2015	
区域音乐文化(Regional music culture)	1980	2.9206	2014	2019	
传承 (Inherit)	1980	4.4297	2015	2019	
民族音乐学(Ethnomusicology)	1980	6.1777	2015	2017	

Figure3. Top 20 keywords with the strongest citation bursts of MG

In Figure 3, after removing keywords similar to searched words, such as "music", "folk songs" and "traditional music", the keywords such as "rheology", "color zones of the folk song" and "inheritance" are worth of being explored.

(1) "Rheology". The duration is 2008-2019. Almost every year, some researchers wrote about the evolution of traditional music, and in the past 12 years, there were some differences in researchers ' concerns. At first, when researchers began to study this direction, they mostly discussed the changes of traditional music in melody, lyrics, etc. , in other words, they paid more attention to the music itself. For example, Cai Jizhou focused on the changes in the scale and interval relationship of music melody (Cai Jizhou, 2008). but when the time turns to 2019, the researches about rheology was not limited to the music itself but included the change of the list of plays and the difference of the aria in the music(Shi Chunxuanzi, 2019). Then, we found that in 2010 and 2018, researchers were studying the evolution of *Meng Jiangnu*, a folk song of Jiangnan, was born in Suzhou, Jiangsu Province, and has been spread all over the country. In 2010, Feng Zhiquan studied the rheology of *Meng Jiangnu* to Shanghai, Zhejiang Province, and analyzed the lyrics and tunes (Feng Zhiquan, 2010). In 2018, Jiang Keke analyzed the north and south of China of *Meng Jiangnu* by taking Qinling and Huaihe rivers as the boundary (Jiang Keke, 2018). The rheology of the music style of *Meng Jiangnu* expanded compared with the researches in 2010 in terms of its circulation place and analysis content.

We believe that in the next few years, the direction of rheology should be in a state of continuous concern by researchers in the field. For example, in traditional music, the research about the rheology of instrumental types is relatively limited. In addition to Zhu Xiaofeng, Ding Chengyun et al. who have studied the rheology of plucked instruments(Zhu Xiaofeng, 2015; Ding Chengyun, 2019), the rheology of other traditional musical instruments such as suona horn and pan flute were not be researched, and in the next study, researchers can try to pay more attention to them.

(2) "Color zone of the folk song". When discussing the first stage of MG development, Miao Jing and Qiao Jianzhong (Miao Jing et al., 1985) proposed the concept of "color area of folk songs" mainly from the distribution of Han folk songs. However, folk songs of ethnic minorities are also an important part of Chinese folk songs. Therefore, in the follow-up study, more researchers began to pay attention to the division of color zone of ethnic minorities' folk songs. The duration of the study was shown in Figure 3 as 2008-2015. Ba Lu, Wang Yan et al. have studied the division and music characteristics of Mongolian folk song color areas in China (Ba Lu, 2009; Wang Yan, 2014); Tian Liantao has studied the regional characteristics and music color zone of Tibetan music in China (Tian Liantao,2014); Sun Jie has studied the music color zone of Buyi Nationality in China (Sun Jie, 2015). It showed that the study of color zone of folk song is not only focused on the Han folk songs or the division of color zones, but also focused on the division of color zones and music characteristics of ethnic minorities.

In recent years, the research on color zone of the folk song has decreased compared with the previous studies. We think that in the future, the research direction on color zones will be focused less on the division of color areas because there are many studies about it which are mature, Comparing the similarities and differences between the adjacent ethnic music color zones should be focused on more attention. In addition, Han music color zones may be concerned more in the future.

(3) "Inheritance". More researchers paid attention to inheritance from 2015 to 2019 in Figure 3, it can be seen that some researchers paid more attention to the combination of music intangible cultural heritage protection and regional culture. In fact, since 2009, some researchers in MG began to pay attention to how to better inherit and protect music intangible cultural heritage under the vision of music geography. Ou Lanxiang once demonstrated that the relatively independent cultural area in the border of Jiangsu, Shandong, Henan and Anhui provinces was not in sync with the administrative area, and pointed out the limitations that protection of "intangible cultural heritage" was under framework system of administrative division. She proposed to use the method of cultural geography to replace the administrative division with the cultural area, so the catalogue system and spatial distribution map of "intangible cultural heritage" under framework system of administrative division should be adjusted (Ou Lanxiang, 2008). Since the establishment of the China Intangible

Cultural Heritage Protection Association in 2013, more intangible cultural heritage attracted people's attention. In MG, the number of related articles increased. Jiang Jing, Xiao Ping et al. used regional music as a background to explore the feasibility analysis of the overall protection of music "intangible cultural heritage"(Jiang Jing, 2014; Xiao Ping, 2015); Zhang Bin, Xiang Wen et al. focused on the protection and geographical distribution of music intangible cultural heritage projects in a specific place or region, such as Jilin Province (Zhang Bin, 2017), the drainage areas of the Yangtze River (Xiang Wen et al., 2019).

Inheritance, as a hotspot in recent years, its research heat may not be decreased in the next few years. In the future, we can start with "inheritance and protection" and use the professional knowledge of MG to better protect the intangible cultural heritage projects of music in China. What's more, we can also combine with the local cultural industry and use the professional knowledge of MG to better explore the multiple values of music intangible cultural heritage, such as artistic value, ideological value, social value and economic value.

(4) Using the software, such as music database, Geographic Information System (GIS), etc. to analyze the field of MG. Although there are no relevant keywords about music database or GIS in Figure 3, we also analyzed and summarized this point, and think that in the future, more researchers will use this method to do more intuitive and clear research in MG through specific data or images. At present, relevant articles including Cai Jizhou, Xiang Wen, used music database and GIS, combining qualitative analysis and quantitative analysis, to make a preliminary study on the division of "Bashu-Jingchu" music culture area in the drainage areas of the Yangtze River and the geographical distribution of Hubei Tiange (Cai Jizhou, 2015; Xiang Wen, 2017).

However, more researchers in this field have musical professional background rather than geography background, they need to take time to explore the use of geography-related software such as GIS. Therefore, the number of relevant articles is relatively limited at present. If the researchers with music professional background and geography professional background can study this research together, there would be more research achievements in the field of MG.

Conclusion

In this article, the literature in the field of MG is taken as the research objective. According to the principle of bibliometrics, analysis of the literature by CiteSpace, and the trend of literature quantity, research hotspots and research frontier of MG in China from 1983 to 2019 are obtained. After analyzing the results, the following conclusions were drawn:

Since 1980, some researchers began to pay attention to MG. Up to now, there are more and more researches about MG, and the number of literature is on the rise as a whole. In recent two years, it has a little bit fallen down. In the frontier aspect, it mainly discussed the keywords such as " rheology" ," color zone of the folk song" and " inheritance", and pointed out that "rheology" and "inheritance" would be the hot research in the next few years; with the help of software, music database and GIS will be used in the research of MG, which should be paid more attention in the next few years.

Because we haven't done much research in the field of MG before, all our thoughts are based on literature reading and software analysis data plus our own summary, and we welcome researchers in the field can make some criticism and correction for us.

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