

Bibliometric and Visualized Analysis of the Research on Nüshu in China

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Abstract. Nüshu, also known as “female scripts”, is a unique gender specific literal symbol system in the world, which covers a series of comprehensive local cultural phenomenon with distinct female characteristics. This paper concerns the bibliometric and visualized analysis of the research on Nüshu in China, based on the database of China National Knowledge Infrastructure (CNKI) and with the help of the mapping software Cite Space. The analysis results show that: i) Nüshu research goes through three stages, namely academic introductory stage (1987-1999), discipline foundation stage (2000-2007) and discipline growing stage (2008-2017); ii) “Chinese language and characters” and “basic research in social science” still take the dominant position on Nüshu research. Nevertheless, the trend of Nüshu research topic presents a transformation from Nüshu “scripts” to Nüshu “culture”, to “females” and to other diversified applied subjects.; iii) Institutions and authors of Nüshu research are mainly concentrated in several universities in Hunan and Hubei province of southern China, which more engaged in regional but less engaged in the cross-region and interdisciplinary cooperation. For this, the author calls for constructing a theoretical discipline system and methods that guide the Nüshu research in various disciplines, and promoting the interdisciplinary integration and collaborative innovation.

Introduction

Nüshu, also known as “female scripts”, is a unique gender-specific literal symbol system in the world, spreading among women in Jiangyong County and its surrounding regions in Hunan Province, China, also known as “Jiangyong female scripts”. It is also the only script created and used exclusively for women in the world, which was included in the Guinness World Records as “the most gender specific language” in 2005. In a broad sense, Nüshu means Nüshu culture, which is a comprehensive local cultural phenomenon with distinct female characteristics, containing female scripts, Nüshu (literary works), female songs, female friends, needlework, and Nüshu customs, and covering various cultural fields, such as female culture, traditional culture, folk culture, ethnic culture, religious culture, regional culture and farming culture, etc. In 2006, Nüshu customs were listed in the first batch of China’s national intangible cultural heritage, and at present, Nüshu culture is now declaring for “World Intangible Cultural Heritage” [1].

Nüshu research is of great value in studying female culture and the origin of civilization [2]. Gong published the article, “An Investigation Report on a Special Character: a Documentary of Dayao Mountain in Southern Hunan Province” in 1983, Ever since it was introduced to academia for the first time [3]. Nüshu has received widespread attention from domestic and foreign academic. Early domestic pioneering scholars in the field such as Gong [4,5], Xie [6-8], Zhao [9-12] and Chen [13,14] have done a lot of rescue work and fundamental research to promote further research on Nüshu in the fields of linguistics, ethnology, folklore, anthropology, sociology, pedagogy, fine arts, music, etc [15-17]. But at present, there are few review papers on the research of Nüshu, and the periodic

research reviews are all qualitative descriptions [18-20], and up to date, there is no comprehensive systematic analysis and quantitative scientific analysis on the research of Nüshu in China. This study conducts systematic quantitative analysis and visualized expression of previous research papers about Nüshu, by running the information visualization software Citespace on the basis of CNKI database and degree papers database, aiming to reflect the current status and existing problems of the research development of Nüshu, and to reveal the hot topic of Nüshu research and its development trend, which provides a guide to the future studies of Nüshu.

Materials and Methods

Three methods are employed in this paper, namely bibliometric analysis method, content analysis method and visualization analysis method [21-23]. Bibliometric analysis method mainly analyzes the development process and research status of a certain field objectively with the publishing rules of research papers on the basis of quantitative analysis method; content analysis mainly focuses on the research contents and conducts systematic and classified statistics by combining the quantitative analysis and qualitative analysis effectively; visualization analysis method mainly presents the structure, rules and distribution of knowledge in a certain research field intuitively by using visualization technology software, and explores the internal relationships, like the interactions among knowledge clusters and evolution, etc. This paper draws the keyword co-occurrence mapping, research institution co-occurrence mapping and author co-occurrence mapping respectively with the help of CiteSpace (5.1. R8 SE), and carries out the database information mining and scientific analysis of Nüshu literatures. With three methods, research status and problems are analyzed systematically, including the history of Chinese Nüshu research, related disciplines, research hotspot, institutions and teams, etc.

This paper takes China Science Periodical Digital Database of CNKI and degree papers database as the data source of Nüshu literatures. “Nüshu” is selected as the search query, and “title” is selected as the search path. In order to guarantee the comprehensive and accurate literature data, and high credibility, validity and degree of explanation, retrieval results are categorized and examined to eliminate irrelevant items, such as meeting notices, news reports, introduction of individual academic achievements, introduction of scientific research institutions, book review and works with no author information. As a result, 368 valid journal papers and 46 theses and dissertations of Nüshu research are obtained then end of December 2017.

Results and Analysis

Stage Analysis of Nüshu Research Development

Search results showed that Nüshu research goes through three stages: namely academic introductory stage (1987-1999), discipline foundation stage (2000-2007) and discipline growing stage (2008-2017): i) academic introductory stage: The earliest two papers on Nüshu searched by Journal database retrieval were appeared in 1987 [24,25], till 1999, the annual published papers of Chinese Nüshu research grew slowly, and in this stage, the total amount of research literatures was small, but it was of pioneering theoretical value for Nüshu research development, as the introductory stage of research. The annual average number of research papers was 3.1, the annual average number of important journal literatures was 1.7, but there emerged no any funded papers or degree theses. ii) Discipline foundation stage: From 2000 to 2007, it was the foundation period of Chinese Nüshu research, during which, Nüshu research started to become a unique discipline. As a result, the total number of research papers and important journal papers grew substantially, and specifically, the annual average number of development research papers was 13.1, and the annual average number of important journal papers was 5.1. In this stage, there emerged 2 funded papers and 6 master's theses about Nüshu research. iii) Discipline growing stage: After 2008, the number of state-level and provincial funded papers increased substantially, and there were 68 funded papers, among which, 15

were funded by National Natural Science Foundation of China and 7 were funded by National Social Science Foundation of China. In this stage, there occurred 4 doctoral theses and 36 master's theses about Nüshu research. The annual average number of published papers related to Nüshu research and important journal papers was 27.6 and 7.1 respectively, and important journal papers accounted for 98.6% of total funded papers, but the proportion of high-quality papers declined remarkably, and important journal papers of Nüshu research only accounted for 25.7% of total related papers, lower than the second stage, namely 38.9%, and much lower than the first stage, 54.8%, indicating that the number of Nüshu research papers did not grow synchronously with its quality, and the depth of Nüshu research development was not as good as the breadth of its development(see Figure 1).

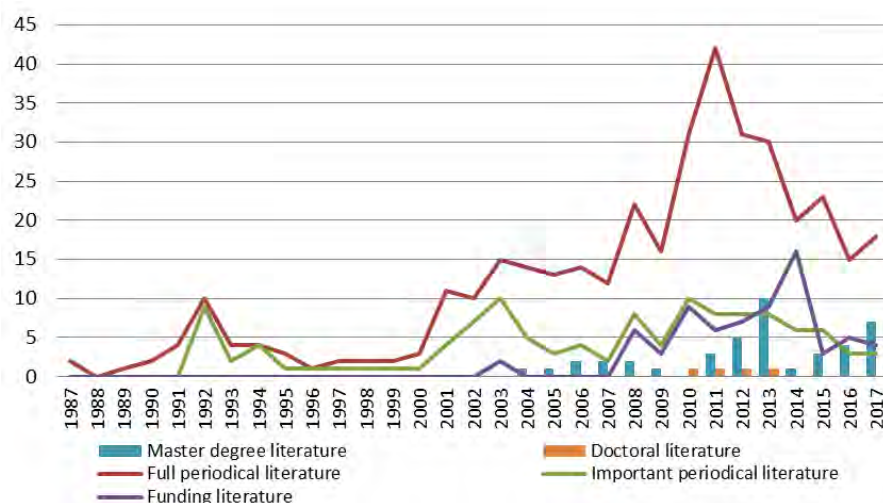


Fig. 1, Annual statistics of Nüshu research literature

Disciplinary Field and Its Hotspot Analysis on Nüshu Research

Disciplinary field have covered 40 disciplines currently by analysis for 368 papers retrieved with “Nüshu” as the search query, including Chinese language and literature, Fine arts, Calligraphy, Sculpture, Photography, Computer software and computer application, Culture, Tourism, Music, Dance, Sociology, Public administration, Press and Media, Archives and Museums, Biography, Ethnology, Light Industrial Handicraft, Archaeology, Chinese Ethnology and Local History, etc., among which, top five disciplines with more than 20 published papers are Chinese language and literature, fine arts, calligraphy, sculpture and photography, computer software and computer application, culture and tourism, etc., and the number of those papers accounted for 85% of total. Furthermore, Keyword co-occurrence analysis proceeded in “Citespace” software for these 368 papers shows that there are 59 keywords occurring for more than twice in the literature, among which, Nüshu and Jiangyong Nüshu, and Jiangyong County, as the keywords of research target and region, accounted for 62.9% of total frequency of keywords, and other hotspot keywords revealing the research field and occurring for more than four times only include Nüshu (Female scripts), Nüshu culture, Female, Characters, Intangible cultural heritage, Feature extraction, etc. accounting only for 22% of the total frequency. The above analysis shows that the disciplinary fields of Nüshu research are relatively scattered and superficial, and the main fields in which the direction of research being relatively clear are such as Female Scripts research, Female Cultural research, Female Sociology research, Computer Development Application research, and Eultural Heritage Protection research, but they are smaller in quantity and less prominent in hot spots. In the meantime, the keyword co-occurrence mapping in “time zone” showed the development trend of Nüshu research, which research hotspots basically appear the developing track from Scripts to Culture and then to Woman in different stages, that is that early Nüshu research theme was mainly dominated by Nüshu philology; while in the middle stage, the culturology research field expanded. After 2008, the disciplinary field of Nüshu research increased remarkably, on the basis of which female sociology and culturology,

computer application technology, intangible cultural heritage protection on Nüshu started to emerge as hotspot fields (see Figure 2).

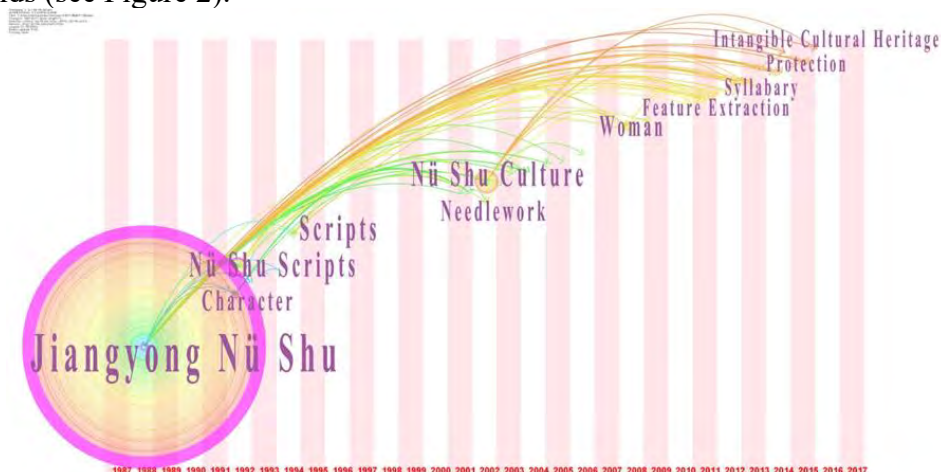


Fig. 2, Nüshu research key words co-occurrence in “time zone”

Research Institution and Author Co-occurrence Analysis

Nüshu research core institution co-occurrence mapping generated by CiteSpace software can be used to analyze the core institutions of Chinese Nüshu research field, its academic influence and cooperation intensity. By integrating secondary institutions, institutions publishing 6 or more papers only include four colleges and universities, namely Hunan Institute of Technology, South-Central University for Nationalities, Wuhan University and Hunan Normal University, among which, Hunan University of Science and Engineering located Nüshu in Yongzhou area, South-Central University for Nationalities and Wuhan University where Chinese Nüshu research founders Zhimin Xie and Zhebing Gong were from published more than 10 papers, as the main academic center of Chinese Nüshu research. There are other nine institutions publishing 2 to 4 papers, such as Central China Normal University, Hubei Normal University and Hunan University of Commerce, indicating the strong regionalism of the distribution of Nüshu research centers, and it is mainly dominated by Hunan and Hubei. Seen from the inter-institution cooperation co-occurrence relation, there are few cooperating institution networks, of low intensity, and there is no barely inter-disciplinary cooperation (see Figure 3). In the meantime, Nüshu research prolific author co-occurrence mapping drawn with CiteSpace software shows that there are 11 authors publishing more than 5 papers. L.L.Le, an educational researcher from Hunan University of Science and Engineering, published the most papers, followed by Zhebing Gong, from the field of Chinese language and characters in Wuhan University and Jiangqing Wang, from the field of computer application in South-Central University for Nationalities, Zerun Peng in Hunan Normal University and Xiarong He Central China Normal University from the field of Chinese language and characters. Six cooperating teams are displayed in the mapping, among which only the team of “Nüshu standardization and Recognition Technology Research” from South-Central University for Nationalities shows the inter-disciplinary and institutional research, and Cooperation among the other high-yielding authors is within the team. The above analysis reveals that although the number of authors of Nüshu research presents a growing trend, it is relatively scattered, of low cooperation intensity. Prolific authors also show staged characteristics in the publication of papers.



Fig. 3, Nüshu research core institution co-occurrence

Summary

(1) Nüshu and Nüshu culture are rich in the value of cultural diversity, inheritance and resources, but currently, Nüshu research is not profound enough, and discipline system has not taken shape yet, and it has not yet entered the stage of maturity. An important bottleneck restricting Nüshu research development shall be the contradiction between the complexity of Nüshu cultural research and existing discipline division system.

(2) In the future, Nüshu research and its disciplinary development should rely on the collaborative innovation platform and mechanism that break the discipline and specialty barrier to promote the inter-disciplinary integration, collaborative innovation and linkage application of it and construct a discipline system and theoretical methods that guide the study of Nüshu in various disciplines.

(3) Nüshu is characterized by outstanding regional culture, but Geography has not set foot in this field yet, which is recommended to change urgently. Therefore, geography shoulders mission of Nüshu research and is given strengths of disciplinary characteristics. In the future, we should vigorously promote the study of Nüshu in the fields of geography, especially human geography and cultural geography, give full play to their comprehensive and regional disciplinary advantages, and lead the comprehensive study of Nüshu and Nüshu culture.

(4) As a local comprehensive cultural phenomenon, Nüshu research can start from the theory of its cultural gene. By constructing Nüshu cultural genetic symbol system and establishing Nüshu gene database as the theoretical and methodological basis of applied research in all disciplinary fields, it will lead the innovation and product development in all fields based on Nüshu cultural gene, provide market value to cultural resource, and realize the dynamic protection and sustainable development of Nüshu cultural heritage[26].

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