# Research on Early Warning of Network Public Opinion Based on Bibliometrics

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**Abstract**

Public opinion early warning research is the "pearl in the crown" of public opinion research in the network era. Network public opinion early warning research has been carried out for 15 years. By combing the 248 articles collected by CNKI we can more comprehensively understand the context and trend of network public opinion early warning research, and better promote the improvement of network public opinion early warning research system. With the help of CiteSpace and CNKI, this paper makes a bibliometric statistical analysis of the number of articles published over the years, the main research forces and the distribution of major journals. Research findings: Domestic research on online public opinion early warning began in 2007, and began to increase in 2011. The main research strength is concentrated in domestic universities, among which the 985 and 211 project universities account for a relatively small proportion. Most of the target literature comes from Library and Information and technical journals.

**Keywords:** *network public opinion; early warning; bibliometrics*

## 1.Introduction

On August 27, 2021, the China Internet Network Information Centre released the 48th Statistical report on the Development of China's Internet in Beijing. According to the report, as of June 2021, the number of Internet users in China had reached 1.011 billion, with an Internet penetration rate of 71.6 percent. One billion users are connected to the Internet, forming the largest digital society in the world. Due to the rapid development of Internet technology and the continuous increase in the number of netizens, Weibo, Wechat and short videos have become important carriers for people to express social feelings and public opinions because of their hidden information, convenient release, wide range of dissemination and fast dissemination time. The attitudes, emotions and opinions of a large number of netizens are intertwined into network public opinion [1]. If the network public opinion does not respond in time or the disposal effect is not good, it is very easy to cause bad emotions among netizens, and the impact on society can not be underestimated.

In the network public opinion guidance and government administration, the biggest challenge is to make the best response at the first time [2]. Network public opinion early warning refers to the scientific and reasonable actions taken to deal with the public opinion crisis during the period from the appearance of public opinion events to the beginning of the perception of losses [3]. The construction of an efficient early warning system of network public opinion can advance the fire-fighting work of public opinion disposal to prevention and control in advance, improve the network public opinion response ability of governments at all levels, and reduce or avoid the impact of public opinion crisis on social stability. The early warning of network public opinion is a dynamic and comprehensive task. At present, some achievements have been accumulated in the relevant research in academic circles. This study used the methods of bibliometrics to sort out the development trends of this subject to provide reference for further research on early warning of network public opinion.

## 2.Data and methods.

### 2.1. Data sources.

China National Knowledge Infrastructure (CNKI), initiated by Tsinghua University and Tsinghua Tongfang, is the largest library of literature resources in China. An advanced search was conducted on CNKI, with the

search form of "theme = online public opinion early warning". The search time was December 31, 2021, and the literature category was "academic journals". Other conditions default, a total of 474 academic journal papers were retrieved. According to the title, abstract and keywords of the search results, the search results are screened independently by three people, and if they do not have the consensus view, they enter the second screening. After deleting reviews, reports, incomplete data information and weak correlation papers, 248 valid papers were obtained, which were exported in Refworks format and named " download_1" to form a sample database.

## 2.2. Research methods.

In this paper, bibliometrics and content analysis are selected to visually analysis the hot topics and evolution trends of online public opinion early warning research. CiteSpace is a literature analysis software developed by Professor Chen Chaomei of Drexel University in the United States, which is mainly based on the idea of "co-occurrence clustering" to mine the hidden patterns and rules of specific disciplines and domain knowledge structures. This study uses Excel2016, CiteSpace software and CNKI visual analysis module to sort out the related papers on the topic of online public opinion early warning. Meanwhile, analyse the main research forces, the distribution of major journals and draw the corresponding charts.

## 3. Results and discussion

### 3.1. Annual publication Statistics.

Statistics of the number of journal papers published over the years can quantitatively reflect the degree of activity in this research field. Figure 1 shows the number and trend of online public opinion early warning research from 2007 to 2021. Ke Jian published "Early warning and countermeasure mechanism of network public opinion from the perspective of harmonious society" published in Red Flag manuscript. This published on August 10, 2007, is one of the earliest. The latest article is "Research on the early warning model of college students' network public opinion based on dynamic evolution" published by Li Chuan on December 21, 2021. As can be seen from figure 1, the number of articles published on early warning of online public opinion has shown a trend of fluctuating growth in the past 15 years, with an average of 3.5 articles per year before 2010, and the research is in its infancy; since 2011, there have been more than 10 articles, especially 38 in 2016. From 2011 to 2016, a total of 117 articles were published, accounting for 47.18% of the total, which is in the stage of active exploration. The number of articles issued in 2017 declined to a certain extent, with an annual average of 23.4 articles by 2021, and the research has entered a stage of steady development.
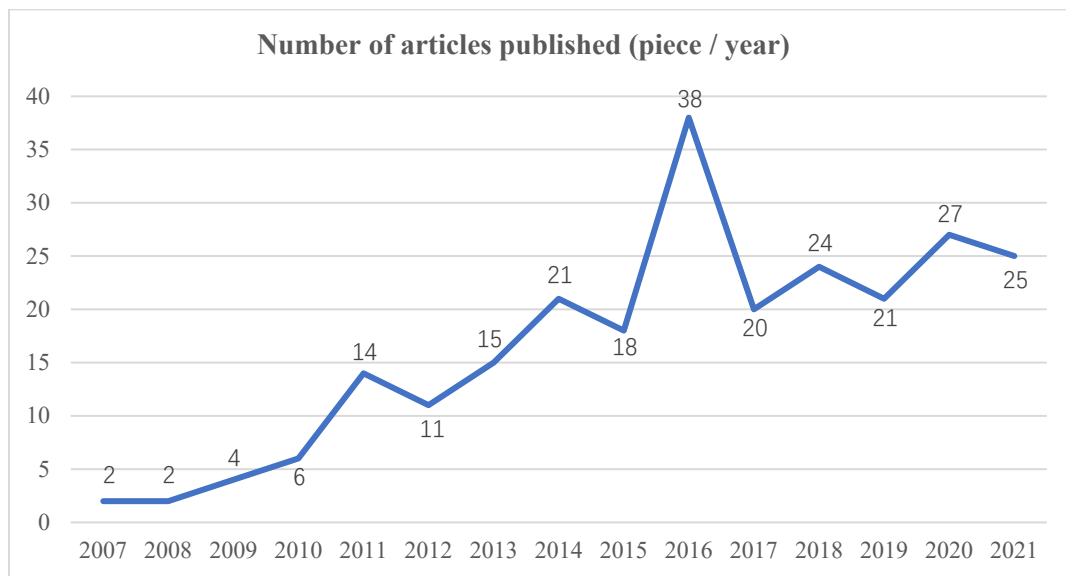


**Figure 1.** Number of articles published (piece / year)

## 3.2. Main research forces.

Through the statistics of the authors' articles, we can find the maturity of the core authors and the author group in the research field. According to Price's core author calculation formula [4], we can get the core authors in the field of early warning of network public opinion. Table 1 is the top 20 core authors in the field of early warning of online public opinion from 2007 to 2021. That is, more than 2 articles are the core authors in this field. According to the formation conditions of Price's core author group, we can judge the maturity of the core author group [5]. There are 14 core authors in the field of early warning of online public opinion, with a total of 51 articles, accounting for 20.56%, which does not meet the judgment condition that the total amount of articles

published by core authors accounts for half of the total literature. This shows that from the perspective of statistical data, the research field of early warning of online public opinion has not yet formed a core author group.

**Table 1.** Top 20 authors in terms of number of posts (2007-2021)

| Ranking | Author | Number | Ranking | Author | Number |
|---------|--------|--------|---------|--------|--------|
| 1 | Lan Yuexin | 8 | 11 | Peng Cheng | 3 |
| 2 | Le Zhongjian | 4 | 12 | Li Bicheng | 3 |
| 3 | Sun Lingfang | 4 | 13 | Hou Tiantian | 3 |
| 4 | Ding Juling | 4 | 14 | Wang Jin | 3 |
| 5 | Dong Jianfeng | 4 | 15 | Peng Lihui | 2 |
| 6 | Zeng Runxi | 3 | 16 | Zhang Yanfeng | 2 |
| 7 | Liu Haiming | 3 | 17 | Lei Chun | 2 |
| 8 | Zhang Peng | 3 | 18 | Feng Hongqi | 2 |
| 9 | Qu Zhikai | 3 | 19 | Li Ming | 2 |
| 10 | Lin Chen | 3 | 20 | Liu Yi | 2 |

Table 2 shows the statistics of the top 10 institutions in the number of online public opinion early warning research papers in China. The Chinese people's Armed Police Force Academy ranks first. Lan Yuexin, Qu Zhikai and Zhang Peng of this institution are the core authors in this field. As can be seen from Table 2, the research on early warning of online public opinion in China is mainly concentrated in colleges and universities, and mainly in the school of management, such as the School of Public Management of Huazhong University of Science and Technology, the School of Management of Heilongjiang University of Science and Technology, the School of Management of Nanchang University and the School of Economics and Management of Jiangsu University of Science and Technology. Generally speaking, the research strength of early warning of online public opinion in China is relatively weak. Among the top 10 universities with published articles, there are only two national 985 project universities (Huazhong University of Science and Technology, Jilin University) and one national 211 project university (Nanchang University), with a total of 12 articles, accounting for 4.84%. At the same time, there is a lack of academic exchanges among research institutions, there is not much cooperation on topics related to early warning of online public opinion, and a vibrant and strong research community has not yet been produced. Interdisciplinary and academic innovation need to be further improved.

**Table 2.** Top 10 organizations in terms of number of posts (2007-2021)

| Ranking | Institution | Number |
|---------|-------------|--------|
| 1 | Chinese people's Armed Police Force College | 9 |
| 2 | Huazhong University of Science and Technology | 6 |
| 3 | Heilongjiang University of Science and Technology | 5 |
| 4 | Jilin University | 4 |
| 5 | Information Engineering University of PLA | 4 |
| 6 | Jishou University | 4 |
| 7 | Jiangsu University of Science and Technology | 4 |
| 8 | Jiangxi University of Finance and Economics | 4 |
| 9 | Harbin normal University | 3 |
| 10 | Nanchang University | 2 |

### 3.3. Distribution of major journals.

To a certain extent, the distribution of periodicals can reflect the concentration of literature performance in a certain discipline or field, and is one of the important indicators to evaluate the development level of the field [6]. Understanding the source journals of the papers can reveal the spatial distribution of academic achievements in the research field and provide effective information for

further research. Using Excel to combine the sample data, the results show that the 248 articles about early warning of online public opinion published from 2007 to 2021 come from 156 journals, with an average of 1.59 articles. According to the number of articles published in journals, the list of the top 10 journals is shown in Table 3, involving 76 papers, accounting for 30.65%.

By observing Table 3, it can be found that most of the papers in this research field are published in Library and Information category and technical journals. The top 10 journals are divided into two distinct categories according to the compound influence factors, and the first five compound influence factors are all above 3 points. Sorting out the highly cited literature, it is found that the first 10 highly cited articles are distributed in four journals, including five in the Journal of Intelligence, three in Library and Information Service, and one in Information Studies: Theory & Application. The highest article was cited in the " Research on the early warning mechanism of Internet public opinion ", co-authored by Wu Shaozhong and Li Shuhua of the Chinese people's Armed Police Force College, which was published in the Journal of People's Public Security University of China. According to the comprehensive analysis from the view of periodical distribution, the average number of articles published is relatively low, and most of the articles published by authors are single articles, and 123 journals have published 123 papers. At the same time, the quality of the paper is seriously polarized, and the core journals account for only 1/10.

**Table 3.** Top 10 journals with published papers (2007-2021)

| Ranking | Name | Number | Proportion |
| --- | --- | --- | --- |
| 1 | Journal of Intelligence | 19 | 7.66% |
| 2 | Information Science | 11 | 4.44% |
| 3 | Journal of Modern Information | 10 | 4.03% |
| 4 | Information Studies: Theory & Application | 7 | 2.82% |
| 5 | Library and Information Service | 7 | 2.82% |
| 6 | Information Research | 6 | 2.42% |
| 7 | Network Security Technology & Application | 5 | 2.02% |
| 8 | Computer Knowledge and Technology | 5 | 2.02% |
| 9 | Journal of News Research | 3 | 1.21% |
| 10 | Journal of Information Engineering University | 3 | 1.21% |

## 4.Conclusion.

China is currently in a period of social transformation. The improvement of national economic strength and the level of knowledge have promoted people's pursuit of freedom of speech. With the mixture of true and false information in the online world, the emerging social network platform has become a hotbed of public opinion reproduction, which is not conducive to the harmony and stability of the real society. Experts and scholars in the fields of communication, information science, management and so on have devoted themselves to the study of network public opinion. Taking the early warning of online public opinion as the starting point, this study combs the relevant journal papers of CNKI in the 15 years from 2007 to 2021, and mainly makes a bibliometric statistical analysis on the number of articles published over the years, core authors, main research institutions and the distribution of major journals. It is found that the domestic research on early warning of online public opinion began in 2007 and began to grow in 2011.The main research efforts are concentrated in domestic universities, of which 985 and 211 colleges account for relatively few. The target literature is mostly from Library and Information category and technical journals.

## References

[1] Liu Y. On the concept, characteristics, expression and dissemination of network public opinion [J]. Theoretical circle, 2007 (01): 11-12.

[2] Zhao YZ. Research on the idea of upgrading from public opinion monitoring to public opinion early warning [J]. People's Forum, 2019 (32): 123,125.

[3] Ding JL, Le ZHJ, Xue Q. Construction of quantitative network public opinion crisis early warning model [J]. Library and Information Service, 2011 555 (20): 59-63.

[4] Zhong WJ. Evaluation of Core authors based on Price's Law and Comprehensive Index method-- taking Library Construction as an example [J]. Science and Technology Management Research, 2012 32 (02): 57-60.

[5] Gao FH, Qi K, Zheng R. A Summary of the Research on Network Public opinion of Public crisis events in

Colleges and Universities [J]. Science and Technology Communication, 2020 (12): 156158.

[6] Wang L. Research situation Analysis of domestic Precision Agriculture Technology based on Bibliometrics [J]. Shanxi Agricultural economy, 2018 (01): 124,126.