Research on the Hot Spots and Trends of Police Intelligence Based on the Analysis of Core Periodicals

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Abstract: Based on the core periodicals and comparative analysis, the police intelligence research hot spots and future trends from the four aspects of discipline construction, talent training, intelligence technology and national security, which provides reference for the development of domestic public security intelligence discipline and practice. CiteSpace selected 2003 domestic and foreign core periodicals (collections) documents in this field from CNKI and WOS databases for analysis. After data pretreatment, it generated keyword co-occurrence chart, keyword burst ranking chart and keyword timeline chart; and used content analysis method, system clustering method and chronological evolution analysis method to reveal and compare research hotspots and topics in this field. It is concluded that in the context of national security, promoting the construction of police intelligence, talent and technology is the forefront of current research; pay attention to the transformation of public security intelligence research results, strengthen open source intelligence, absorb the research results of various disciplines, divide the boundaries of public security and national security and straighten out the relationship between practical departments.

Key words: bibliometry; CiteSpace; national security; police intelligence

Introduction

At the end of 2020, the Suggestions of the CPC Central Committee on Formulating the 14th Five-Year Plan for National Economic and Social Development and the Long-term Five-Year Goals call for "coordinated development and security", "focus on blocking loopholes and weak items, play first, take the initiative, and effectively prevent and defuse all kinds of risks and challenges" (Xinhua News Agency, 2020). Based on this, the public security intelligence team needs to improve their working ability and enhance their own quality to "ensure that the early warning and prevention work always goes ahead of risks" (The Ministry of Public Security, 2019). The research of public security intelligence is not only of advisory and guiding significance for decision-making services, but also a sharp tool to prevent social risks and maintain social harmony, but also an important guide for the development of the national security situation (Su, 2018). In the post-epidemic era, the global political, economic and industrial environment has undergone great changes, and China's economic, political and security fields are facing a new impact and impact. How to continue to explore and innovate under the new situation, and then establish the leading and decision support position of public security intelligence, is the new task and new mission of the academic community.
Literature Review

It tracks the academic research hotspot in the field of domestic public security intelligence through bibliometric research, which is commonly used in the academic analysis and research method, which is easy to grasp the research subject, research content theme and correlation relationship in the shortest time. Scholars at home and abroad have carried out certain theoretical and empirical research in the field of public security intelligence. In recent years, relevant academic research institutions and groups have also held a number of academic seminars on the frontier issues of public security intelligence. Domestic public security intelligence research field, although Hong Lei (2019), Jiang Yufeng (2010), Xie Xiaozhuan (2014) in Scholars have conducted research, but have not combined with the field of foreign police intelligence and national security background, while foreign research scholars, such as Figuerola (2017) and the Dragan Ivanovicp (2016). Although measurement research has been conducted based on book intelligence literature, there is no literature research on police intelligence.

Data Source and Processing

The article takes CNKI and WOS databases as the search sources as "public security intelligence, police intelligence and Public Intelligence, Security Intelligence, Secure Intelligence, Public Security Intelligence" respectively, Topic information for the retrieved literature was retrieved and downloaded under the Chinese CSSCI Search Journal, Peking University Core Journal, and WOS Core Collection; The posting year was set to 2010-2021, Retrieved on December 30, 2020 and March 1, 2021, Foreign literature types in WOS include Article, Book Review, Review and Proceedings Paper, The final search identified 95 domestic documents and 1,908 foreign documents.

In order to intuitively compare police intelligence at home and abroad, the core information of CNKI and WOS is integrated and software data entry analysis, so that the comparative analysis of measures under the same statistical dimension, meet the scientific research methods of control variables, making the researchers have intuitive feelings about the number of domestic and foreign literature data in the same period.

Comparison and Analysis of Police Intelligence Literature Characteristics at Home and Abroad

Filehiometry is a subject that takes the goal of statistical bibli characteristics. According to the three laws and cross mathematics, statistics and other disciplines, the distribution rules, quantity relationship and change process are displayed, in order to explore the characteristics and laws of the field of the subject (Qiu, 2019). The paper focuses on the measurement characteristics of domestic and foreign police intelligence literature and analyzes the content to summarize the current research hotspots and future trends. Therefore, integrate the relevant knowledge of philology, select high-frequency keywords co-occurrence analysis, keyword burst ranking, keywords timeline plot to elaborate, so as to provide data support for hot spots and trend demonstration.
Key Word Co-occurrence Feature Analysis

Keywords are a high summary of the main content of the literature, through the key words can be the theme of the article "dial the cloud to see the sun", "bright". A number of keywords generated by multiple documents have a certain association. The more these keywords appear in the same literature, the more the number of research topics and association literature represent one of the studies. Common word analysis refers to the research method and analysis perspective that use the keywords of the literature and the noun phrases in the main text to determine the relationship between the literature covered in the topic. CiteSpace can be correlation keywords in straight line, the type and content of circular nodes, frequency according to the node radius and color depth, clustering analysis for keywords, to "#" as the identification, the smaller the number, the more keywords contained in the cluster, each cluster is based on the word correlation summary abstract and combined with the corresponding algorithm, crisscross, interwoven, common knowledge chart network in software analysis results, achieve a clear effect at a glance. The first half of Figure 1 is divided into domestic police intelligence keywords occurrence and cluster chart, and the second half is divided into foreign police intelligence keywords.

![Figure 1 (a). Occurrence and clustering diagram of domestic police intelligence keywords](image1)

![Figure 1 (b). Occurrence and clustering diagram of foreign police intelligence keywords](image2)
It can be seen from Figure 1 that the domestic public security intelligence research literature highlights the elaboration of the hot topic of "big data". The main node "public security intelligence" is scattered to "intelligence analysis", "public security intelligence" and "intelligence leading police", and is staggered with the node with the key word "intelligence analysis". It shows that "intelligence analysis", as the main content or method of public security intelligence research, acts as the "hub" in the whole knowledge chart, highlighting the characteristics of public security as the practical discipline of solving public security problems. In addition, police intelligence sharing is the node with less association, indicating that intelligence sharing research is less or out of non-hot topics. From the clustering situation, intelligence analysis, big data and public security intelligence take "big data" more prominently, which shows that the correlation between big data and public security intelligence is becoming stronger and stronger.

Due to the large number of foreign literature, there are keywords also large, such as "intelligence (Intelligence)"", "security (Security)", "artificial intelligence (Artificial Intelligence)"", "system (System)", etc., keywords have the characteristics of widely distributed and interleaving each other. From the node crossover situation, "big data (Big Data)" "information" Information) ""terrorism (Terrorism) ""framework (Framework) "aggregates and diverges more literature and becomes the" traffic hub " of nodes, so it can be judged that as a secondary hotspot is often presented as a research method or research topic. From the clustering situation, "security intelligence (Securing Intellectural)", "Control Intelligence (Domesticating Intelligence)" and "machine learning (Machine Learning)" are in the forefront, indicating that the combination of technology with police intelligence and security guarantee have become the continuous correlation points and hot spots of police intelligence.

Key Word Sudden Ranking

The burst detection is Kleinberg. The detection algorithm proposed in 2002, burst nodes mainly have burst keyword nodes, burst literature nodes, burst author nodes, etc (Chen, 2021). The article selects burst keyword nodes as the basis for analysis. In CiteSpace, the more burst nodes contained in a cluster shows that the more active research in the field or may become a new trend of future research in the field. Figure 2 (a) shows the protrusion of domestic police intelligence keywords, and (b) shows the projection of foreign police intelligence keywords.

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Year</th>
<th>Strength</th>
<th>Begin</th>
<th>End</th>
<th>2010 - 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>公安情报</td>
<td>2010</td>
<td>2.7726</td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>公安</td>
<td>2010</td>
<td>1.3136</td>
<td>2011</td>
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<td>2015</td>
<td></td>
<td></td>
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<tr>
<td>情报主导警务</td>
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<td>0.4628</td>
<td>2015</td>
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<td>2010</td>
<td>0.9499</td>
<td>2015</td>
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<tr>
<td>警务情报共享</td>
<td>2010</td>
<td>1.3863</td>
<td>2016</td>
<td></td>
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<td>2010</td>
<td>1.3863</td>
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Figure 2 (a). Domestic police intelligence keywords appear suddenly figure
According to domestic research, in 2010, "public security intelligence" became the word in 2010 in 2015, 2017. The intensity coefficient of "big data" was close to about 2.2 in 2010, which shows the popularity of big data and public security intelligence in recent years.

In 2013 to 2016, the foreign research on national security was very hot, with its coefficient of 2.7707, indicating that foreign police intelligence research focused more on security; in 2020, Cyberspace intelligence as the hot spot, indicating that the research of network open source intelligence has become a relatively hot police intelligence research theme recently.

Keyword Timeline Chart

The combination of timeline diagram and keywords is an effective way to quickly grasp the trend of hot spots, which can intuitively show the spatiotemporal association between nodes, and the overall content is arranged in chronological order. The timeline diagram of the CiteSpace is exactly the product of this requirement. According to the high-frequency keywords extracted from CNKI and WOS literature combined with the publication time, it can clearly present the synchronous trend of keyword frequency and occurrence time, and further explore the research hotspots of domestic and foreign relevant years in the field of police intelligence. The first half of Figure 3 is divided into the timeline evolution diagram of domestic police intelligence research, and the second half is divided into the timeline evolution diagram of keywords of foreign police intelligence research.
From the perspective of domestic research, focus on public security intelligence and intelligence analysis before 2013, after 2016 focus on intelligence-led police theory and practice, big data technology, 2013-2016 research topics, academic atmosphere; from foreign research perspective, on genetic algorithm, machine learning, cyber attack technical research keywords, International Relation(international relations), Social Network(social network) keywords only appeared since the second half of 2017. Overall, there were rich research results around 2016.

Brief Summary

According to the metrological results of the above three keywords, the summary is as follows:

Content covers a variety of big data technologies. As is known from Figure 1, a number of nodes and small themes are scattered under the main nodes of "public security intelligence" and "Intelligence", and a number of small categories are presented in terms of the association and centrality of the nodes. This shows that at home and abroad, the key words in the field of police intelligence research are rich and diverse, showing the potential of hundreds of thought. It integrates computer science and intelligence science, and integrates the strengths of all families, which has produced many creative achievements. According to statistics, the top three documents used in the data are 336 of national security theme documents, 302 of big data and intelligence, and 261 of cyber security threat intelligence. It shows that national security, big data and network security have become hot issues in police intelligence research. According to the content analysis method, in the national security and network security articles, big data technology is more or less mentioned as a research method or technical means. Therefore, a series of relevant theories and technical operations around the life cycle of data (collection, preprocessing, analysis, mining and storage) is a hot field of police intelligence research at present.

Big data and police intelligence. Police work has entered the era of big data, which has been widely used in various fields of police work. For example, big data open source intelligence collection, data modeling and analysis are also the focus and forefront of police intelligence research in recent years. Figure 1 also shows
that the relevant theory and operation have become prominent hot spots at present. The reason why the two can combine, certainly has its necessity and feasibility:

The first is the commonality of the data and the intelligence itself. Data itself can not fully express its connotation, need to be explained to reflect its value, data after processing becomes information, and knowledge is formed by people cognition and join their own experience information, police intelligence is facing the police theory and actual combat demand information integration, therefore, police intelligence is a large data large part to meet the needs of its relationship identified it has common characteristics;

The second is the development of big data technology. With the emergence and maturity of emerging big data technologies such as virtual container, distributed block storage, graph computing and data convergence, it has become possible to apply it to the public security business, making big data technology a "catalyst" to accelerate the development of police intelligence has become a general consensus of intelligence academia and practical departments in recent years;

Thirdly, the policy support of public security big data and public security informatization. In 2019, the National Conference on Public Security Science and Technology Informatization and Big Data Intelligent Construction stressed that "vigorously promote the implementation of the public security big data strategy to provide strong support for fulfilling the mission and tasks in the new era" (Ministry of Public Security, 2019). For police intelligence big data, visualization, platform provides strong policy support, in recent years extensive artificial intelligence platform, public security big data intelligent construction application, "public security + disease control + big data" such as "pinch, elite" vivid practice took root, make the integration of intelligence and big data development to a higher level.

The national security theme runs throughout. National security is an important cornerstone of stability, but at the same time infiltration subversion sabotage activities, violent terrorist activities, ethnic separatist activities, religious extreme activities is a huge threat factor to national security, for China, the rest of the world, so national security became police intelligence research "evergreen", reflects the police activities for national security and social governance, so in the figure 3 time chart or in figure 2 keywords sudden chart are shown;

Today, "the world is undergoing great changes unseen in a century" (Xinhua News Agency, 2021). Global COVID-19 outbreak, local conflicts and other instability elements have put forward higher requirements for the function of police intelligence, in the performance of the results, other small node content is also related concepts and content under the current national security theme, such as CIA, government (Government), policy (Policy), privacy (Privacy), etc.

Research Hotspots in the Field of Global Police Intelligence

Through the research conclusion of the second part and the comprehensive summary of CNKI and WOS data measurement results, the following four aspects include the hot topics of global police intelligence. Among them, the reflection of the traditional way of police information acquisition, the discussion of the integration
with network security digital forensics technology, and the analysis of the political role of public information with historical cases are the unique parts of foreign police intelligence research, which are the issues that domestic scholars need to focus on in the future research:

Research on Police Intelligence Theory System and Discipline Construction

Theoretical research is the basis of police intelligence research, the foundation of supporting discipline development, and the framework basis of police intelligence practice operation. From the perspective of vertical development, police intelligence theory is the result of the thinking process of constantly revising and improving the past understanding, which is the abstract elaboration of police intelligence work through the connotation and extension of special conceptual terms.

The difference is that the domestic emphasis on the scientific nature and comprehensiveness of the system, and highlights a certain theoretical direction, such as the research paradigm, the characteristics of the teaching model: Peng Zhihui (2013) From the macro degree of the research paradigm of Marxist scientific methodology, Xie Xiaoproudly clarifies the concept and history of the research paradigm of public security intelligence and emphasizes the connotation and significance of intelligence-dominated police as the current discipline research paradigm (Xie, 2013). Explain the history and connotation of the concept of public security intelligence, and the discipline system of public security intelligence includes four parts: basic theory research, public security intelligence business research, public security intelligence technology research, public security intelligence management research, and foreign scholars emphasize the syllabus, and less specific police intelligence theory research: Baechler Simon (2019) put forward the school police cooperation, strengthen the training of talent actual combat ability; Vogel (2019) take the American Intelligence Community (IC), as an example, and always advocate for the continued maintenance of discipline and business partnerships in industry, academia, and intelligence. Therefore, in terms of police intelligence theory system and discipline construction research, the research hotspots at home and abroad are research methods, discipline relations, among which domestic is theoretical oriented and foreign is practical oriented. China's public security intelligence has become mature from the theoretical system and discipline construction, and to some extent, borrowed from the relevant theoretical and method experience of American intelligence agencies and intelligence circles.

Research on the Education and Training of Police Intelligence Personnel

The education and training of police intelligence talents is the sum of educating the teaching groups under the guidance of the police discipline theory, with a relatively stable teaching and training objectives and the talent needs of practical departments (Zhou, 1998). The training of police intelligence talents is a series of processes of teacher-student interaction, extracurricular practice and self-criticism after class. "Cultivate first-class talents and produce first-class achievements". That is, how to apply it to the educated groups on the basis of mature existing theories, its system includes ideological guidance, curriculum outline, teaching objectives, evaluation categories, etc. Domestic scholars also put forward their own views on the content: such as Yang Yanying (2015) put forward "school coordination, training and war" to strengthen the practical ability training of students; Yuan Jinghui (2019) proposed to refer to the US security law enforcement education in three
aspects of improving education guarantee, optimizing the curriculum and changing the intelligence education concept, and improve the intelligence talent training model in China; Feng Wengang (2019) emphasizes the application of flipped classroom in the teaching process of public security intelligence science, and suggests an interactive platform to adapt to flipped classroom to give full play to the internal value, self-effectiveness and self-regulation of students in flipped classroom.

**Expand Intelligence Technology Methods with Digital Technology**

(1) Big Data Technology and Artificial Intelligence Technology in Police Intelligence Technology

Public security intelligence technology involves collection, processing, storage, retrieval, analysis, judgment, transmission and protection. Domestic relevant articles have deeply analyzed and demonstrated the word "big data" from the perspective of management and collection requirements. And combined with the classic theory of police intelligence (such as "intelligence leading policing" theory) to conduct abstract analysis (Peng, 2015). However, it still lacks how micro technology or algorithm is used in public security intelligence, mostly text description, less specific operation; foreign police intelligence technology focuses on micro level, such as security response technology, intelligent confrontation model, security services in social network, big data analysis of wireless network (Arakaki & Willett, 2009; Koloveas, Chantzios, Tryfonopoulos & Skiadopoulos, 2019).

(2) Reflections on Traditional Police Intelligence Acquisition

The traditional police intelligence collection method specifically refers to human intelligence, that is, the artificial criminal intelligence obtained by the investigation department, mainly including the use of investigators and secret forces disguised equipment to obtain, and investigators collect criminal intelligence from the society and criminals (Liu & Wang, 2019). Taking the traditional intelligence collection in historical events as the research case, the analysis of human intelligence from the content, collection behavior and the effect of intelligence effect is another hot topic of foreign research. Based on the work of obtaining intelligence on interrogation activities of criminals, when Newbery (2009) speaking, the intelligence obtained from interrogation under coercion may be false; an agent may have a "double" property that becomes a means of spreading false information and believes that interrogation activities are vulnerable to human rights violations. Ruth Blakeley (2019) Britain has revealed repeated intelligence gathering at military detention facilities in Afghanistan and Iraq against torture. The above articles mostly point out that although the traditional intelligence collection has a role and value, but it often appears poor accuracy, weak legitimacy, strong aggression and other problems.

(3) Network Security and Digital Forensics Technology

The development of information technology such as 5G, artificial intelligence and the Internet of Things promotes the iteration and upgrading of communication technology. Electronic data has become the main existence form of the current data (Li, 2015). It is difficult for single-point police intelligence personnel to cope with the rapidly changing intelligence needs. Police intelligence needs to be based on the ontology,
expand research fields, and comprehensively analyze all fields that can threaten social and public security. Foreign scholars such as Riesco (2019) and Yu Yong (2019). In recent years, the protection of industrial control systems (such as nuclear facilities, power systems, etc.) in organizational assets is taken as an example to analyze the early warning effect of cyber threat intelligence, and also emphasizes the need for intelligence analysts to have the skills in criminal investigation activities to extract effective digital traces to make them more strategic in fighting criminal activities. There are many cybersecurity fields and electronic data evidence collection; the combination of police intelligence and network security and forensic science (electronic data evidence collection) is self-evident in the future.

Exploring the Current Development Situation under the Context of National Security

(1) Subject Relationship and Positioning of National Security and Public Security Intelligence

Domestic research on national security disciplines began in 2016 (Liu, 2018). It is the integration of other disciplines in the previous non-military, non-public security national security field (Gao, 2019). However, there is a cross-sectional relationship between national security and military affairs and public security itself, and domestic research lacks the in-depth elaboration of such problems. National security intelligence is an important part of national security. To build a scientific and complete national security discipline, it is not only necessary to deal with the relationship between the content system construction of the original intelligence disciplines, but also to further sort out the relationship between the primary, secondary and tertiary disciplines (Mao, 2020). In 2020, the Academic Degrees Committee of the State Council approved the establishment of "cross disciplines" with the first-level disciplines of "national security science", and the national security intelligence theory research ushered in new development opportunities. In the future, the clarification of the relationship between national security and public security (intelligence) science in China needs to be solved by non-traditional discipline division methods based on the practice of national security and public security intelligence business. Relying on the characteristics of the primary disciplines of different universities (Guo, 2020). Integrate and cross the existing resources with national security to create a discipline construction with distinctive characteristics.

(2) Explores Police Intelligence Agency Reform from Intelligence Relations with National Security

Foreign literature considers the feasibility of police intelligence cooperation with the national security intelligence department, which usually occurs under non-legally binding informal arrangements. This cooperative advantage expands the scope of data exchange. Although the data integration of countries under the original regulation of the geopolitical relevant treaties may not be the type of cooperation envisioned between the intelligence and security sectors (Ryngaert & Van Eijk, 2019). However, the cooperation ideas provided by many articles can still provide some learning and reference for China, such as Scott (2019) and the Gundhus (2020). It is recommended that police intelligence agencies be functionally used as an important supplement to national security departments for resource interaction, and that more organizations should interact with functional similar agencies of police intelligence agencies, such as Customs, CIA.

Although the public security intelligence department and the national security department are not a hot issue...
in recent years, with the need, the function allocation and emergency scheduling of the two needs to be actively imagined and studied in the future, it does not mean that the future police officers can abuse their power in the name of "national security" (Bolto, 2019).

(3) Analyzes the Political Role of Public Intelligence in Historical Cases

In the monograph, it discusses the complex relationship between intelligence and policy, and focuses on politicization, combining the historical cases during the Vietnam War, Cold War and Iraq War to discuss the relevance of US foreign policy events and intelligence assessment (Joshua, 2016); Other articles emphasize the political role of public intelligence with the relevance of intelligence agency strategies and political events in historical events (Moulton, 2019; Nutt, 2019). Although social public intelligence is extracted from public information or public intelligence sources, many foreign articles point out that it plays an important role in analyzing and judging the characteristics of important figures and the future trend of relevant historical, political events, emphasizing that public intelligence has potential political attributes.

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