

# *Evolutionary Path and Development Trends of Emergency Language Research in Ethnic Minority Areas: A Visualized Analysis Based on CiteSpace Knowledge Mapping*

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**Abstract:** To address the developmental imbalance in China's Emergency Language Services, this study conducts a systematic bibliometric analysis of literature from the CNKI database spanning 2005 to 2025. Using CiteSpace, we perform a rigorous comparative analysis between general Emergency Language Services and Emergency Language Services in ethnic minority regions across four dimensions: publication trends, researcher-institution distribution, keyword co-occurrence, and network clustering. By visualizing research hotspots and evolutionary paths, this paper reveals the current developmental status of Emergency Language Services in ethnic minority areas. These findings provide essential theoretical references and practical insights for the future advancement of this specialized field.

## 1. Introduction

As a vital pillar of national security, Emergency Language Services have become a critical strategic priority [1]. Within this field, Emergency Language Services in ethnic minority areas focuses on ensuring communication efficacy in complex linguistic environments during crises. Despite policy support from the 14th Five-Year Plan for the National Emergency Management System [2], emergency mechanisms in these regions remain weak compared to national-level frameworks and lack systematic practical experience [3][4]. Consequently, this study employs knowledge mapping to visualize the current research status of ethnic minority Emergency Language Services. By exploring its knowledge structure, research hotspots, and frontier dynamics, this paper aims to provide the theoretical depth and practical insights necessary for constructing robust emergency systems and fostering social harmony.

## 2. Materials and Methods

### 2.1 Data Sources and Retrieval Strategies

The literature data for this study were retrieved from the CNKI database, with the search period spanning from January 1, 2005, to July 15, 2025. To ensure comprehensiveness, a three-step systematic retrieval strategy was employed:

(1) Core Term Retrieval: Initial literature collection was using core terms such as "Emergency Language" "Language Emergency" and "Urgent Language."

(2) Expanded Subject Retrieval: To broaden the scope, terms related to "Emergency" and "Language Services" were decomposed. Eight common synonyms for "emergency" (e.g. disaster, crisis, accident) and seventeen subordinate terms (e.g., earthquake, fire) were combined with synonyms or related terms of "language services" (e.g., multilingual services, emergency translation).

(3) Domain-Specific Retrieval: Qualifiers such as "Ethnic" and "Ethnic Minority Areas" were applied to isolate specialized research.

A final dataset of 732 qualified journal articles was established, including 145 papers specifically focused on Emergency Language Services in ethnic minority areas.

### 2.2 Definition of Core Concepts

In this study, "ethnic minority areas" encompass China's five autonomous regions, eight provinces and regions, as well as various ethnic minority autonomous prefectures and counties. These regions share common characteristics: a large minority population, vast autonomous territories, remote geographical locations, relatively restricted transportation, lagging economic development, and a social background of multicultural coexistence[5].

### 2.3 Research Methodology

This paper employs CiteSpace software to perform a multi-dimensional and dynamic visual analysis of relevant journal articles. The goal is to reveal the intrinsic connections between documents, the migration trajectories of research hotspots, and the evolutionary trends of the academic frontier, thereby gaining a comprehensive grasp of the latest research dynamics.

## 3. Analysis of Trends and Characteristics of Emergency Language Service Research

### 3.1 Differences in Research Dynamics

The annual volume of published literature serves as a key indicator of research output and developmental trends within a specific field over different periods [6]. (Figure 1, Figure 2)



Figure 1. Statistics of Annual Publications on Domestic Emergency Language Service Research

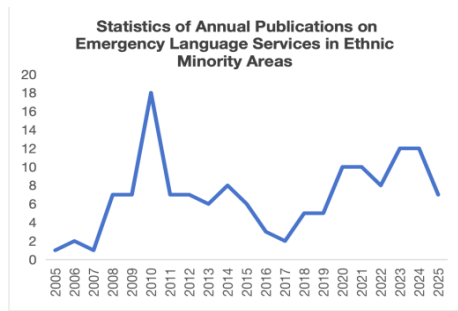


Figure 2. Statistics of Annual Publications on Emergency Language Services in Ethnic Minority Areas

### 3.1.1 Divergence Analysis: Significant Gaps in Field Maturity

The general field of Emergency Language Services has entered a mature stage, with an annual publication peak of 125 papers. Furthermore, its industrialization level is remarkably advanced: according to the 2024 Report on the Development of Emergency Language Service Industry, the total output value of China's Emergency Language Service industry reached 117.4352 billion yuan in 2024, with nearly 200,000 related enterprises. In contrast, the annual publication volume in the ethnic minority field has consistently fluctuated between single digits and a dozen papers.

### 3.1.2 Evolution Phases of Ethnic Minority Emergency Language Services Research

(1) Initial Stage (2005–2008): Driven by the SARS crisis, research focused on crisis management and preliminary emergency mechanisms [7]. Investigations primarily revolved around early-warning systems and translation services. During this period, the annual publication volume fluctuated at a low level (2 to 6 papers), indicating an embryonic theoretical framework.

(2) Fluctuating Growth Stage (2007–2019): Triggered by major disasters like the Wenchuan (2008) and Yushu (2010) earthquakes, the field reached a historical peak of 15 papers in 2010. National policies, such as the National Medium- and Long-term Reform and Development Plan for Language and Characters (2012–2020), provided strategic guidance for service mechanisms. Despite post-peak fluctuations, this stage laid a solid foundation for specialized research [5].

(3) Resurgent Deepening and Dual-Peak Driven Stage (2020–2025): The COVID-19 pandemic served as a catalyst, with practical achievements like the Hubei Dialect Manual driving a resurgent interest in ethnic communication [8]. This led to a "bimodal" publication trend (2020 and 2024). This pattern suggests that research is shifting from being purely event-driven to exploring endogenous academic value, signaling an approach toward maturity.

### 3.2 Comparative Analysis of Research Institutions



Figure 3. Institutional Collaboration Network of General Emergency Language Service Research

Utilizing CiteSpace software with "Institution" selected as the node type, this study constructed institutional collaboration network maps for emergency language services and emergency language services in ethnic minority areas (Figures 3 and 4).

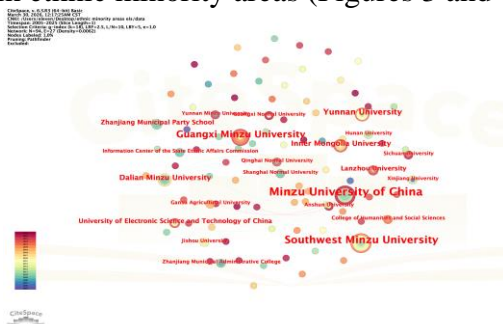


Figure 4. Institutional Collaboration Network of Emergency Language Service Research in Ethnic Minority Areas

### 3.2.1 Disparities in Institutional Quantity and Centrality

Data analysis reveals that the general emergency language services field has already established a dense collaborative network, centered around core nodes such as Beijing Language and Culture University, Emergency Management University, and Ludong University. In contrast, the research field of emergency language services in ethnic minority areas lacks prominent leading institutions, and inter-institutional cooperation remains markedly fragmented and decentralized.

### 3.2.2 Differences in Institutional Types and Spatial Distribution

The research forces in the general field of Emergency Language Services are highly diversified, encompassing linguistic, pedagogical, and comprehensive universities, as well as specialized disaster management institutions, with a broad geographical distribution. In contrast, research institutions in the ethnic minority field are primarily concentrated in ethnic-oriented universities and departments. This pronounced geographical concentration not only reflects the abundant linguistic resources and high frequency of natural disasters in ethnic minority areas but also reveals the spatial limitations inherent in the current research landscape.

### 3.3 Comparative Analysis of Author Collaboration

Utilizing CiteSpace software with "Author" selected as the node type, a visualization analysis was conducted on both datasets to construct the co-authorship network maps for general emergency language services and emergency language service in ethnic minority areas (Figures 5 and 6).

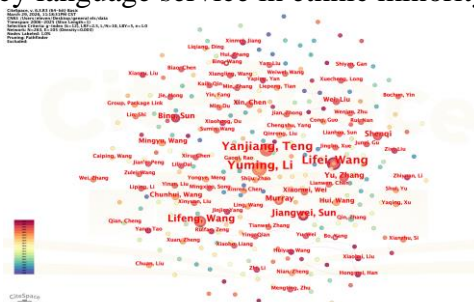


Figure 5. Co-authorship Network of General Emergency Language Service Research

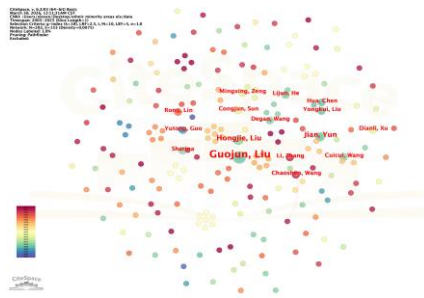


Figure 6. Co-authorship Network of Emergency Language Service Research in Ethnic Minority Areas

### 3.3.1 Disparities in Author Quantity and Collaboration Patterns

In terms of researcher scale, the general field far exceeds the ethnic minority field, reflecting a much larger research community. However, their collaborative modes exhibit distinct structural characteristics: the general field presents a typical "core-periphery" structure, where research predominantly revolves around a few core scholars, resulting in a relatively sparse global network (Density = 0.0034). In sharp contrast, the ethnic minority field demonstrates a "polycentric and clustered" pattern. Although its overall scale is smaller, its network density (Density = 0.0084) and number of collaborative edges ( $E = 199$ ) are significantly higher than those of the general field. This indicates that, despite the smaller research circle, internal team collaboration is more pervasive and cohesive, forming several stable research clusters. Nevertheless, there remains a need to enhance cross-cluster academic exchange to further boost overall research vitality.

### 3.3.2 Core Authors and Academic Influence Structure

In the field of general Emergency Language Service, a group of core authors—represented by Yuming, Li (14 papers), Lifei, Wang (10 papers), and Yanjiang, Teng (8 papers)—has established a dominant position. Conversely, the ethnic minority Emergency Language Services field has yet to see the emergence of academic leaders with equivalent influence. The publication volume of its active researchers remains generally low. This suggests that research depth and academic accumulation in this specialized area require further systematic enhancement.

## 4. Hotspot Detection of Emergency Language Service Research in Ethnic Minority Areas

### 4.1 Analysis of Keyword Co-occurrence Maps and Manifestation of Disparities

Utilizing CiteSpace software with "Keyword" selected as the node type, this study constructed keyword co-occurrence maps for general Emergency Language Services and Emergency Language Services in ethnic minority areas (Figures 7 and 8).



Figure 7. Keyword Network of General Emergency Language Services



Utilizing the "Burst Detection" function of CiteSpace, a keyword burst analysis was conducted on the two datasets (Figures 9 and 10).

The main differences between Figure 9 and 10 are as follow:

(1) Disparities in Evolutionary Paths and Burst Timing

Regarding the evolution of research frontiers, the data reveal that exploration into "systematic institutionalization" started significantly earlier in the ethnic minority field. Between 2007 and 2010, its research frontier focused on the burst of keywords such as "Mechanism," "Mechanism Construction," and "Reflections on Countermeasures," reflecting a pragmatic "bottom-up" path of early exploration aimed at solving specific problems. In contrast, the first large-scale explosion of research hotspots in the general field occurred relatively later, beginning with "Crisis Management" in 2012, which reflects more of a "top-down" characteristic of systemic integration under the guidance of macro-theories.

(2) Disparities in Keyword Burst Strength

A significant disparity exists in the burst strength of research hotspots between the two fields, reflecting different scales of academic attention. In the general field, keywords exhibit exceptionally high burst intensities; for instance, "COVID-19" reached 9.53, while "Talent Cultivation" and "Emergency Language" reached 7.33 and 6.04, respectively. This indicates an extremely dense concentration of research during specific periods. In sharp contrast, burst strengths in the ethnic minority field remain relatively moderate, with even the historical peak for "Mechanism Construction" reaching only 1.98. These data suggest that research hotspots in the ethnic minority field are more decentralized and have yet to trigger a large-scale academic wave.

## 5. Deficiencies in Emergency Language Service Research in Ethnic Minority Areas

### 5.1 Mismatch between Practical Needs and Academic Output

The problem in emergency language research for ethnic minority areas lies in the significant structural mismatch between urgent social practical needs and the current depth and scale of academic inquiry. On the one hand, the national level attaches great strategic importance to this field; for instance, the 13th Five-Year Plan for Ethnic Minority Language and Script Work explicitly prioritized Emergency Language Services as a key capacity-building project [9]. However, academic research activity remains disproportionately low. In terms of scale, while the general field has seen "explosive" growth since 2020 with an average annual output exceeding 100 papers, the ethnic minority field reached a historical peak of only 15 papers in 2010 and has failed to maintain a sustained academic scale. In terms of theory, although explorations into "mechanism construction" began early, these practical experiences have not been effectively sublimated into systematic theories. The keyword network (171 nodes) is significantly smaller than that of the general field (292 nodes), indicating that the construction of its theoretical framework remains in its infancy [9].

### 5.2 Insufficient Research Depth and Breadth

Over the past two decades, the development of emergency language services in ethnic minority areas has been relatively slow, leaving certain gaps in the research field. In *Strengthening Ethnic Language Emergency Planning and Services Based on the Reality of Ethnic Areas*, Mo Bin proposed that detailed emergency service plans for ethnic languages should be formulated and a rapid response mechanism established to ensure the swift activation of language services during major sudden public events [10]. However, existing research remains largely focused on macro-level theoretical speculation, lacking in-depth investigations into individual cases across different ethnic regions. Given the linguistic and cultural diversity and the complex geographical environments of ethnic

minority areas, emergency language services must possess high degrees of specificity and particularity. Future research should draw on mature domestic and international experiences in emergency language services and integrate the actual conditions of China's various ethnic regions to formulate more regionally distinctive emergency language services programs, starting from specific, concrete problems.

## 6. Conclusion

This study conducts a bibliometric analysis of literature on Emergency Language Services from 2005 to 2025, revealing the evolutionary trajectories of both the general and ethnic minority fields. The findings indicate that research in the ethnic minority Emergency Language Services field exhibits distinct characteristics: small-scale, inward-looking, practice-oriented, and theoretically thin. Despite disparities in scale and depth compared to the general field, it possesses indispensable strategic value within the emergency management system under China's multi-ethnic and multi-lingual national conditions. Looking ahead, the key to advancing this field lies in constructing a research paradigm that integrates "top-down" strategic design with "bottom-up" academic innovation. Through continuous exploration, Emergency Language Services in these regions will undoubtedly contribute its unique "power of language" to national security.

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## References

- [1] Wang, L.F., Ren, J., Sun, J.W., et al. (2020) *Concepts, Research Status and Mechanism Construction of Emergency Language Services*. *Journal of Beijing International Studies University*, 42, 21-30.
- [2] Xiao, J.M. and Zhang, Y. (2022) *Review and Prospect of Twenty Years of Emergency Language Research in China*. *Language Strategy Research*, 7, 62-73.
- [3] Chen, X. (2022) *Exploration of Urban Emergency Service Strategies and Related Talent Cultivation from the Perspective of Language Governance*. *Technology Vision*, 16, 103-105.
- [4] Lan, Z.Q. (2020) *Taking Advantage of the Trend to Enhance the Emergency Capability of Ethnic Minority Languages in Sudden Public Events*. *Language Planning*, 02, 54-56.
- [5] Shi, L. (2006) *Analysis on Establishing Response Mechanism for Sudden Public Events in Ethnic Areas*. *Guizhou Ethnic Studies*, 02, 13-17.
- [6] Chen, Y., Chen, C.M., Liu, Z.Y., et al. (2015) *The Methodological Function of CiteSpace Knowledge Graphs*. *Studies in Science of Science*, 33, 242-253.
- [7] Yang, A.H. (2005) *Research on Sudden Events and Crisis Management Mechanism in Ethnic Areas*. *Journal of Public Management*, 03, 42-48+94.
- [8] Fan, B. (2020) *Bibliometric Analysis of Research Literature on China's Ethnic Language Policy and Planning Since the 21st Century*. *Journal of Ethnology*, 11, 93-101+152-153.
- [9] State Ethnic Affairs Commission. (2017) *The 13th Five-Year Plan for Ethnic Minority Languages and Scripts*.
- [10] Mo, B. (2020) *Strengthening Ethnic Language Emergency Planning and Services Based on the Reality of Ethnic Areas*. *Researches on Language Planning*, 02, 63-64.