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Original Paper

A Bibliometric Analysis of Domestic and International Research on Cognitive Interpreting Studies

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Abstract

This bibliometric analysis examines domestic and international core journal articles to map the thematic contours and overall development of cognitive interpreting studies (CIS) over the past two decades. Data were obtained from central databases, including China National Knowledge Infrastructure (CNKI), Taiwan Humanities and Social Sciences Citation Index, Translation Studies Bibliography, Web of Science, and EBSCO. Visualized network maps generated by CiteSpace and traditional literature review provided multidimensional insights into research hotspots and frontiers, as evidenced by co-word frequencies, h-indices, citation counts, publication years, institutional distributions, authorship, and other metrics. Differences in philosophical paradigms, theoretical perspectives, methodologies, and research techniques are highlighted. Research has mostly focused on interpreting pedagogy, language comprehension, working memory, and interpreter capabilities. Looking ahead, fMRI studies, corpus-based analyses, eye-tracking experiments, and inquiries into simultaneous interpretation and sign language interpreting may emerge as new research trends in CIS. Current gaps point to strategies and recommendations for future inquiries to advance this burgeoning field.

Keywords

Cognitive Interpreting Studies (CIS), bibliometric analysis, CiteSpace, research hotspots, research developments

1. Introduction

Cognition research is not new in translation and interpreting studies, with origins tracing back to related disciplines like cognitive science, cognitive psychology, and psycholinguistics. Interpreting research, in particular, has a long tradition of investigating cognitive subjects (Risku, 2012; Alves, 2015; Gile,

2015b; Muñoz Martín, 2012), while cognition had limited emphasis in interpreting studies before the 1960s. When interpreting research blossomed in the 1960s and 1970s, psychologists and interpreters alike were primarily interested in unraveling the "black box" of the cognitive interpreting process (Gile, 2015). Interpreting, involving multiple cognitive processing components like listening, comprehension, memory, and production (Liu, 2005), is a complex information processing activity. Cognitive process research has been a critical focus in interpretation studies as interpreting requires on-the-spot bilingual conversion (Wang & Deng, 2018). Interpreting cognition research applies theories and methods from cognitive psychology and cognitive science to examine the comprehension, memory, conversion, and production processes in interpreting, aiming to uncover the inherent cognitive mechanisms (Pöchhacker, 2015). The exploration of interpreting has progressed from focusing on procedures to multi-tasking and from outlining cognitive steps to investigating bilingual conversion mechanisms, advancing from simple to sophisticated inquiries. The black-box information processing in interpreting remains poorly understood.

Meanwhile, machine interpreting has emerged as an exciting new practice and research area with advances in artificial intelligence. Machine interpreting attempts to simulate human cognition using technologies like speech recognition, text conversion, and speech synthesis to mimic human interpreters. However, real-world applications reveal the immaturity of current technologies in capturing the sophistication of human cognitive processes, presenting an urgent challenge. Therefore, uncovering human interpreting cognition could greatly inform machine interpreting capabilities. Limited research has systematically integrated and reviewed cognitive interpreting studies domestically and internationally. A comprehensive understanding of this field's developments, differences, frontiers, and issues provides valuable insights for researchers. This study aims to elucidate the landscape of cognitive interpreting studies over the past two decades through a bibliometric analysis of 312 empirical articles from relevant academic journals.

2. Literature Review

In the following sections, we delve into the landscape of this field, discussing the various research methods used in Cognitive Interpreting Studies (CIS), as well as the emerging themes and trends. We also examine CIS's current state and future inquiry challenges.

2.1 Emergence and Development of CIS

The cognitive approach to interpreting studies, pioneered by Neisser (1967), sought to demystify human information processing mechanisms. Researchers adopting this perspective have focused on the intricacies of knowledge acquisition and the mental operations integral to interpreting (Gerver, 1965; Moser-Mercer, 1998; Liu, 2001; Seeber, 2007). Through the concerted efforts of scholars and psychologists, cognitive approaches have gained momentum, contributing empirical insights, novel methodologies, sophisticated instruments, and groundbreaking concepts to the discipline.

Interpreting studies emerged as distinct academic disciplines in the 1970s, with research being

conducted at the intersection of linguistics, cognitive psychology, and psycholinguistics, particularly concerning various interpreting modalities (Gile, 2012). Pöchhacker (2015) identifies five dominant paradigms within Interpreting Studies (IS): the Interpretive Theory (IT) paradigm, the Cognitive Information Processing (CP) paradigm, the Neurolinguistic (NL) paradigm, the Translation-Theoretical (TT) paradigm, and the Dialogic Discourse-Based Interaction (DI) paradigm. Initially, the IT paradigm proposed by Seleskovitch (1968) was the prevailing research approach. However, by the late 1980s, it faced criticism for its stagnation and lack of integration with advancements in related fields. This critique began a paradigm shift, with the CP paradigm gaining prominence and becoming the primary reference point for cognitive approaches within interpreting research.

The scope of CIS has since expanded to encompass a broader array of dimensions, modes, and topics, as evidenced by the work of Zhao and Ma (2019). The field has matured significantly, characterized by a growing community of scholars, increased high-quality publications, the establishment of dedicated journals and research centers, and the initiation of large-scale research projects with competitive funding. Contemporary models and theories of cognition have enriched the theoretical landscape, facilitating cognitively oriented investigations into the psychological profiles of interpreters and the cognitive processes involved in interpreting. Moreover, CIS now encompasses a diverse range of modalities, including sight interpreting, simultaneous interpreting, consecutive interpreting, remote interpreting, and sign language interpreting.

2.2 Methodology and Topic in CIS

Scholars from within and beyond the discipline have employed many methods to scrutinize the corpus of scientific evidence on interpreting. Traditional scientific methodologies, characterized by rigorous control, manipulation of variables, and precise measurement of cognitive behavior, have been foundational in experimental research within the field. Concurrently, a broader spectrum of researchers has integrated methods and techniques from cognitive psychology to dissect the interpreting process, including introspective, observational, behavioral, psychophysiological, and neurological approaches. For instance, retrospective protocols have been utilized to allow interpreters to reflect on their mental processes immediately post-task, although this method may inadvertently introduce extraneous variables. Observational methods boast high ecological validity, yet they may fall short in isolating or manipulating specific independent variables. Neurological methods such as electroencephalography (EEG) and functional neuroimaging techniques like functional magnetic resonance imaging (fMRI) offer direct measurements of cortical activity in real time. However, these approaches have limitations, including high costs, lower ecological validity, and susceptibility to noise. Despite the inherent strengths and weaknesses of these individual strategies, researchers often employ mixed methods and triangulation to enhance the validity and reliability of their findings. The empirical research in interpreting, informed by paradigms borrowed from other disciplines, has predominantly focused on the entirety of interpreting tasks. Recurrent themes in this research include memory, comprehension, strategies, and aspects of bilingual processing such as directionality. Furthermore, various scholars

have proposed models of the interpreting process, contributing to a more nuanced understanding of this complex cognitive activity (Gerver, 1975; Moser, 1978; Gile, 1985; Chernov, 1978).

2.3 Current Status of CIS

Current research in Cognitive Interpreting Studies (CIS) presents unresolved issues. For instance, while a plethora of cognitive process models of interpreting underscores the necessity for analysis, extratextual knowledge, and the interplay between comprehension and expression, as well as the constraints of memory and attentional capacity, a comprehensive and empirically validated model of the cognitive processes involved in interpreting remains elusive. Moreover, despite the breadth of topics addressed, the "black box" of the human brain system has yet to be fully deciphered (Holzinger et al., 2017). Beyond these challenges, the reliance on experimental paradigms from cognitive psychology and psycholinguistics necessitates appropriate testing tools, large samples (particularly of professional interpreters), controlled independent variables, and the ecological validity of experimental designs, all of which pose significant hurdles for CIS.

Recent scholarly endeavors have seen a global surge in interpreting studies across various topics, including memory (Wang, 2016; Macnamara, 2016; Zhang & Yu, 2018; Chmiel, 2018), cognitive load (Lv & Liang, 2019; Plevoets & Defrancq, 2018; Liang et al., 2019), expertise (Injoque-Ricle et al., 2015; Muñoz et al., 2019; Korpal & Stachowiak-Szymczak, 2018), and directionality (Lin et al., 2018; Chmiel, 2016; Wang & Napier, 2015), employing advanced technologies such as ERP (Proverbio et al., 2004; Kang, 2016, 2017), eye-tracking (Ma, 2017; Lian & Kang, 2019; Stachowiak-Szymczak & Korpal, 2019), and fMRI (Sui et al., 2013). This underscores the necessity to examine the evolution and trends of related studies to investigate the cognitive approach within interpreting studies thoroughly.

Scientometrics, the quantitative analysis of scientific literature, is a pivotal tool for understanding the evolution, dynamics, and trends of specific academic fields. In interpreting studies, diverse research methodologies have been employed to investigate the field's development and current status, significantly enriching the scientific corpus. Notably, Nadja and Pöllabauer (2008) conducted a multifaceted exploration of spoken and signed language community interpreting within German-speaking regions, utilizing scientometric, network analytical, and text-linguistic tools. Han (2018) provided insights into applying mixed-methods research in interpreting studies by analyzing 312 empirical articles from 36 translation and interpreting journals from 2004 to 2014. Xu (2017) mapped the influence patterns within the Chinese interpreting studies community by examining an extensive corpus of 59,303 citations from the relevant literature. Liang and Xu (2020) surveyed the academic backgrounds of translation and interpreting scholars in China, focusing on articles published between 2011 and 2015 in 16 CSSCI and CORE journals. Wang (2015) assessed the status quo of interpreting studies in China through a bibliometric analysis of quality articles from 2008 to 2012, published in 14 CSSCI and CORE journals.

Despite these contributions, there remains to be more research dedicated explicitly to reviewing cognitive interpreting studies using scientometric methods over the past two decades. The

interdisciplinary nature of cognitive interpreting studies, intersecting with various fields, challenges providing precise and detailed statistical data on prominent issues and trends through traditional documentary methods alone. In the digital information age, advancements in information visualization technology offer novel approaches for analyzing complex statistical data. Tools such as CiteSpace facilitate the visualization of extensive literature data through scientific knowledge maps, enabling researchers to keep abreast of the latest research developments, hotspots, and emerging dynamics. They also aid in identifying existing field problems and forecasting future trends and pressing issues. However, systematic literature reviews of cognitive interpreting studies using CiteSpace software over the past twenty years are scarce. Consequently, to gain a comprehensive understanding of the trends and forefront of Cognitive Interpreting Studies (CIS), CiteSpace is employed for an extensive literature review.

3. Materials and Methodology

3.1 Research Tool

As Borgman (1990, pp. 17-20) identified, scientometrics encompasses four primary focal points: characterizing scholarly communities, tracing the evolution of these communities, evaluating scholarly contributions, and conducting diffusion studies that examine the propagation of ideas within and across disciplines. Given the extensive corpus of experiments and articles within the Cognitive Interpreting Studies (CIS) discipline, employing a scientometric tool such as CiteSpace is invaluable. CiteSpace facilitates scholars' understanding of the evolution, development, and trends within a specific scientific area by pinpointing intellectual turning points and dynamically visualizing citation networks. As a sophisticated network analysis platform based on Java, CiteSpace is a powerful visualization software in recent years. This tool aids scholars in analyzing authorship, keyword co-occurrence, institutional collaboration, citation frequency, cutting-edge research, and the interconnections between recent studies and the foundational knowledge base. Utilizing CiteSpace, this study aims to construct maps of scientific knowledge in CIS over the past decade, identify hot topics, gauge research intensity, recognize key contributors, and forecast future developmental trends in CIS.

3.2 Research Questions

The study aims to address the following research questions:

(1) What is the comprehensive development of CIS, as revealed by the analysis of articles over the last twenty years?

(2) What are the most prominent research front methods, issues, and terms?

(3) How do domestic and international CIS compare? What are their strengths and weaknesses, and how can existing problems be addressed to advance the field?

3.3 Research Object

The papers selected for co-citation analysis were sourced from two databases: the Chinese Social Sciences Citation Index (CSSCI) and the Web of Science (WoS). A keyword search yielded

bibliographic records, including authors, titles, abstracts, references, and sources for further analysis. Specifically, the search terms "cognitive" or "cognition" were used to filter the initial results, followed by a secondary selection based on specific journals, with the inclusion criteria limited to articles written in Chinese and English published between 1999 and 2019 (up to December 31, 2019). Excluding notes, discussions, database reviews, and software reviews, 588 records were compiled for import into the software. Of these, 396 articles were retrieved from the CNKI database and 192 from the WoS database. The study was conducted through a comprehensive literature search, encompassing various document types within the field, mainly journal articles, collective volumes, conference papers, and academic theses. The scope of the publications, the disciplinary affiliations of the authors, the entities (individuals, institutions) engaged in cognitive interpreting research, the networks of authorship and co-authorships, and the prevalent and recurrent topics in cognitive interpreting studies were all considered in the analysis.

This meticulous approach ensures a holistic understanding of the field, providing insights into the intellectual landscape of cognitive interpreting studies. The findings from this scientometric analysis are expected to contribute to the strategic development of the field, guiding future research directions and fostering collaboration among scholars and institutions.

4. Results and Analysis

This section articulates the findings and analytical insights from the scientometric examination of cognitive interpreting studies. Through an array of visualization techniques, the review elucidates the focal areas of research, delineates the trajectory of scholarly trends, identifies key publications, and maps the collaborative networks that have influenced this field over the preceding two decades.

4.1 Keyword Co-Occurrence Network Analysis

Research hotspots are specific topics that garner significant attention within a cluster of papers over a given period (Yang et al., 2013). The analysis of keyword co-occurrence networks provides a visual representation of these hotspots, reflecting the focal themes within the relevant literature. The pursuit of hotspots remains a perennial interest among scholars. This study investigates the research hotspots in the interpreting discipline by analyzing the keyword co-occurrence network using CiteSpace III.

From 1999 to 2019, data were imported into CiteSpace III, with the 'Time Slicing' feature applied to segment the analysis. The author adjusted the parameters to enhance interpretability and clustered the data to generate the keyword co-occurrence maps (Figures 1 and 2). The resulting modularity Q and mean silhouette values were 0.7615 and 0.5025, respectively. These indices evaluate the network structure's clarity and the clustering effect, with a Q value greater than 0.3 indicating a significant community structure and an S value above 0.5 suggesting reasonable clustering (Li & Chen, 2017, p. 170). This research's Q and S values meet these criteria, confirming the clustering map's validity. Each node within the network represents a keyword, with larger nodes denoting higher frequency and greater significance within the network.

The analysis segmented the literature into several research clusters. The frequently appearing keywords in Chinese publications over the last two decades included empirical study, memory, sight interpreting, interpreting pedagogy, schema, interpreting process, and interpretive theory. In contrast, international journals highlighted working memory, comprehension, bilingualism, cognitive control, and individual interference. The diversity of keyword nodes, links, and the coherent structure of this knowledge map indicate that researchers in this field are examining the cognitive processes of interpreting studies from varied perspectives, disciplines, and modes, grounded in different philosophical concepts, paradigms, and methodologies.

Comparing the co-occurrence rates of keywords reveals a shared focus on memory within the cognitive process of interpreting across domestic and international research. Topics span various issues and methodologies, including studies on the relationship between simultaneous interpreting and working memory from a cognitive perspective (Zhang, 2011), differences in working memory between professional and student interpreters during simultaneous interpreting (Liu et al., 2004), and the correlation between interpreters' performance in simultaneous interpreting and their long-term memory (Padilla et al., 2005). Commonly employed research methods include questionnaires, experiments, and interviews.

This convergence in memory-related research underscores its centrality in cognitive interpreting studies. The emphasis on memory across diverse research inquiries and methodologies suggests a foundational role in understanding the cognitive mechanisms underpinning interpreting. The exploration of memory within the realm of interpreting studies is characterized by a nuanced approach, examining the influence of working memory in the context of simultaneous interpreting and the implications of long-term memory on interpreter performance. Such research underscores the intricate and profound cognitive operations inherent in interpreting. These insights underscore the pivotal role of memory within this discipline and signal the promising avenues for cross-cultural and interdisciplinary investigations poised to enhance our understanding of the cognitive underpinnings of interpreting.

Figure 1. A Visualisation of the Keywords Co-citation Network (International)

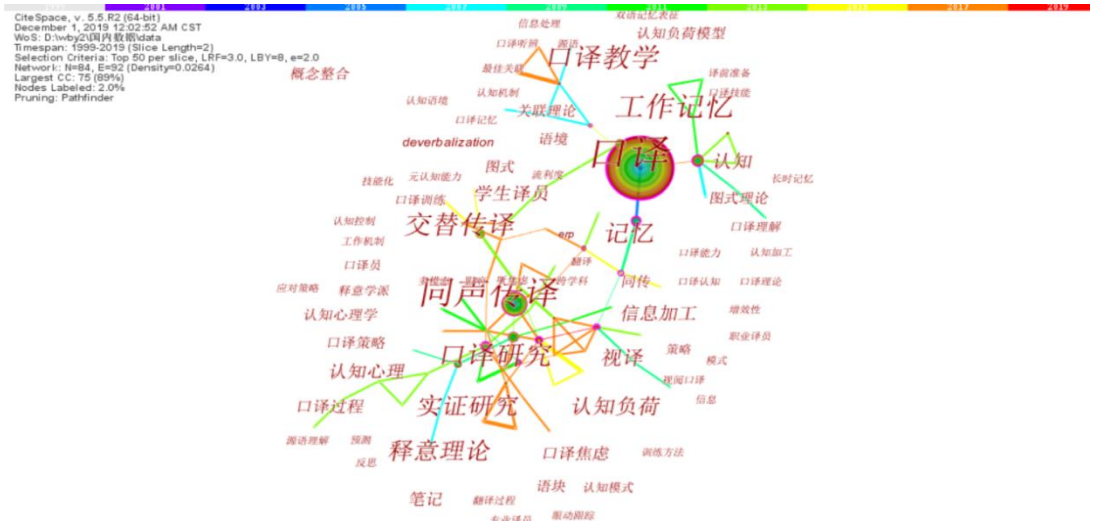

Figure 2. A Visualisation of the Keywords Co-citation Network (China)

4.2 Cluster Network Analysis

Cluster network analysis offers a more granular view than keyword co-occurrence mapping, accentuating the structural characteristics of the research field, spotlighting pivotal points, and elucidating the essential connections between clusters. Within each cluster, the positioning of node tags indicates their centrality, with surrounding nodes forming a research theme around these core concepts. Applying the log-likelihood ratio algorithm facilitates the extraction of high-frequency keywords, enabling a swift and comprehensive grasp of research hotspots and their evolution (Chen et al., 2015). This algorithm employs a probability density function to ascertain the most probable terms, thereby identifying research fronts within a specific timeframe. These fronts represent burgeoning literature that discuss scientific issues or topics, emphasizing the emergence of new trends and characteristics. This

analysis integrates the most robust citation bursts of keywords and emergent literature, coupled with clustering of citing documents, to provide a comprehensive assessment and exploration of the frontier research in the field of Cognitive Interpreting Studies (CIS) for the forthcoming years.

The knowledge map data reveals several clusters within CIS. In Chinese research, the focus areas include language chunks, source language comprehension, cognitive models, comprehension in interpreting, interpreting studies, interpreting training, interpreting pedagogy, context, and student interpreters. Internationally, scholars predominantly engage with topics such as conference interpreting, fMRI, simultaneous interpreting, corpus analysis, critical mass, interpreters, eye-tracking, sign language interpreting, and consecutive interpreting. These clusters indicate a trend of incorporating new technologies into studying the cognitive processes involved in interpreting over the past two decades. For instance, Event-Related Potentials (ERP) have been utilized to investigate the mechanisms of interpreting information processing (Kang, 2016, 2017), corpus methodologies have been applied to study pauses in the target language during interpreting (Wang et al., 2019), eye-tracking has been employed to examine the process of sight interpreting (Hu, 2014; Wang et al., 2018; Zhao & Xu, 2018), and functional magnetic resonance imaging (fMRI) has been used to explore brain activity during code-switching in interpreting (Wang, 2014).

The analysis of these clusters indicates that CIS has experienced significant domestic and international growth, drawing on disciplines such as cognitive psychology, psycholinguistics, and neurolinguistics. A multi-perspective approach, an empirical turn, interdisciplinarity, and methodological innovation characterize the field in China. In terms of cognitive interpreting research published in international journals, cognitive science methodologies are also frequently employed. Novel technologies have been introduced beyond the standard methods used in CIS, such as questionnaires, surveys, experiments, interviews, and think-aloud protocols. For example, ERP was used to study the mechanism of interpreting information processing (Kang 2016, 2017), corpus was adopted to the study pause in the target language in interpreting(Wang et al., 2019), eye tracking was introduced to study the process of sight interpreting (Hu, 2014; Wang et al., 2018; Zhao & Xu, 2018), and functional magnetic resonance imaging (fMRI) was used to explore code-switching of brain activity in interpreting (Wang, 2014).

These advancements reflect a broader trend towards technological integration in research methodologies, allowing for more nuanced and precise investigations into the cognitive mechanisms underpinning interpreting. Adopting such technologies not only enhances the depth and breadth of cognitive interpreting studies but also fosters a more interdisciplinary approach by bridging the gap between interpreting studies and the neurocognitive sciences.

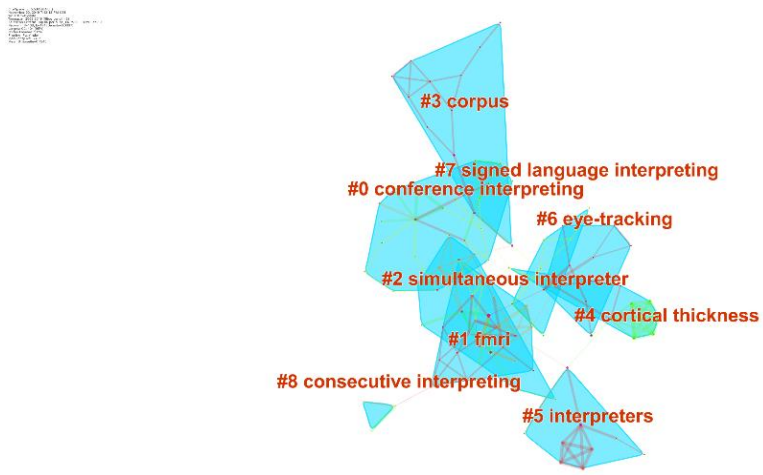

Figure 3. A Visualisation of Cluster Network (International)

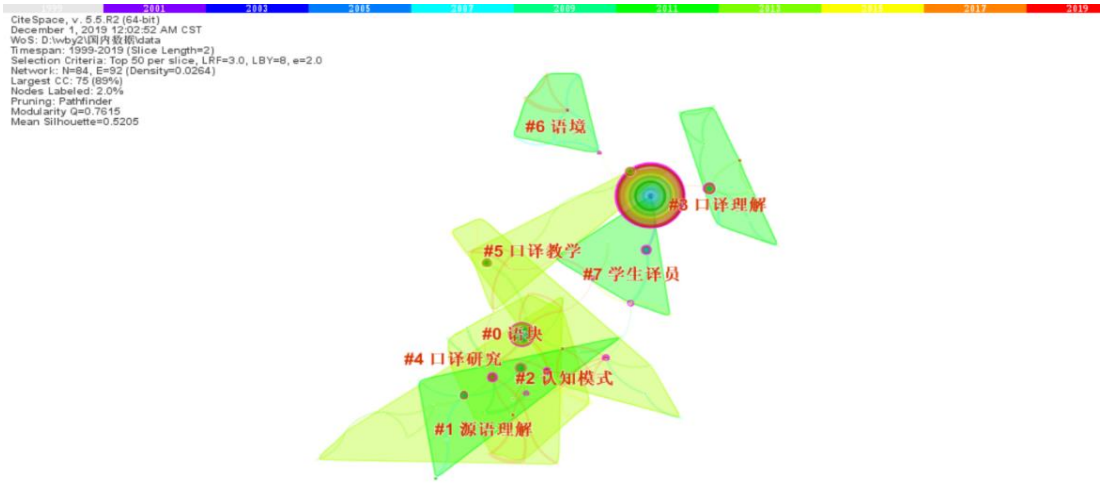

Figure 4. A Visualisation of Cluster Network (China)

4.3 Timeline Analysis

The timeline analysis provides a dynamic perspective on the evolution of Cognitive Interpreting Studies (CIS), highlighting the temporal shifts in co-citation networks. This approach contrasts with cluster views, which focus on segmenting co-citation clusters within a specific timeframe. CiteSpace offers time-zone and cluster views, employing rings, lines, and colors to represent various critical attributes. A ring illustrates the citation trajectory of a reference, with its thickness indicating the volume of citations received during a particular period. The size of the ring is directly proportional to the reference's citation frequency. Lines connecting two rings represent co-citation links, with thickness denoting the strength of the co-citation and color indicating the time of the first co-occurrence. The color bar at the top of the visualization corresponds to distinct publication year segments, with rings and lines colored accordingly.

Red is often used to denote citation bursts, while purple highlights ring with high betweenness centrality, a node's significance based on the number of links passing through it (Chen et al., 2010).

Nodes with high betweenness centrality and citation frequency typically signify groundbreaking scientific contributions introducing novel theories or innovations. Figure 7 presents a time-zone view of the co-citation network for idiom-related publications, labeling nodes with high betweenness centrality (greater than 0.05). This view offers additional insights by mapping the highly cited and pivotal documents that form the knowledge base of CIS and the emergence of new topics over time, thereby depicting the thematic evolution central to CIS research and practice.

The figures below reveal research trends and hotspots, such as working memory and interpreting pedagogy. Additionally, they illustrate the lineage of research themes through connections across time intervals. For instance, there has been a progression from studies on simultaneous interpreting to brain research and cognitive control, from interpreting comprehension to working memory capacity, and from translation and interpreting to cognitive control, among others.

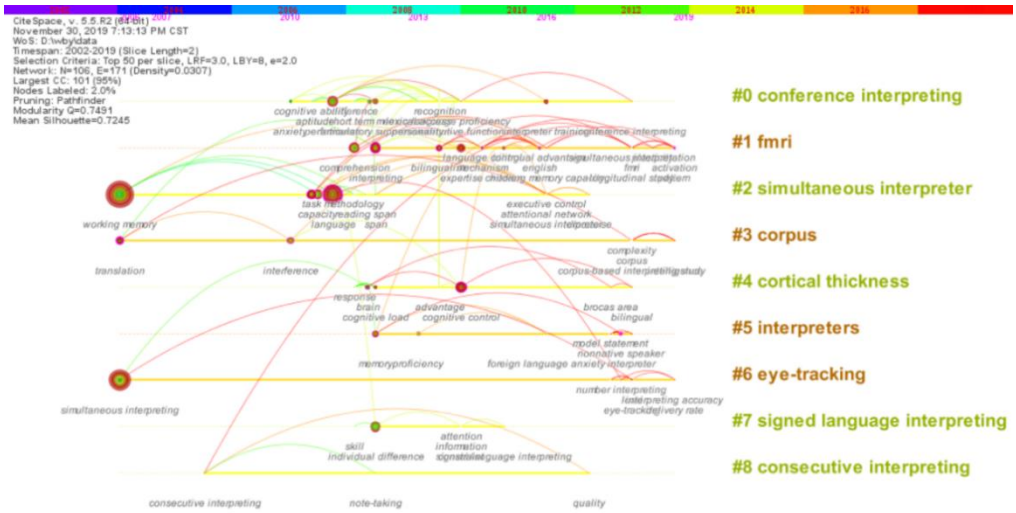

Figure 5. A Visualisation of Time Line (International)

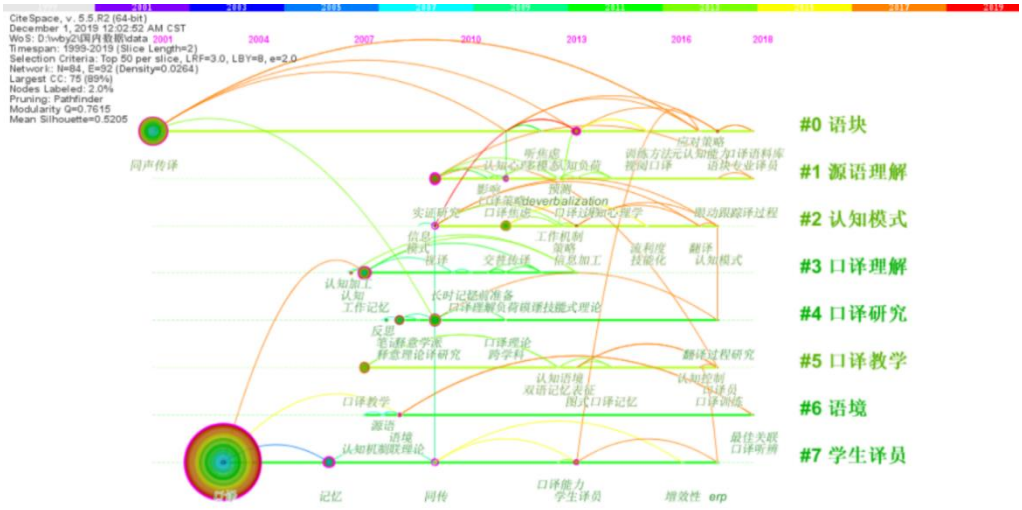

Figure 6. A Visualisation of Time Line (China)

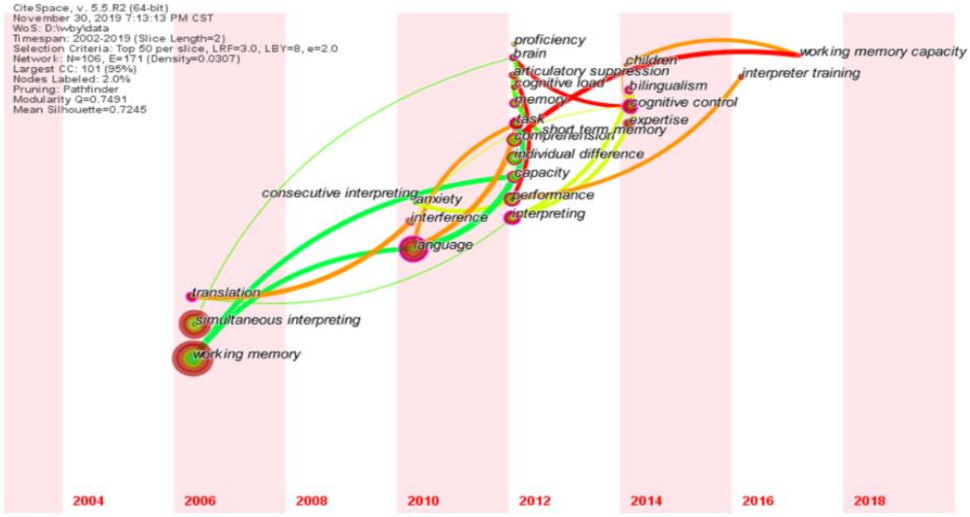

Figure 7. Time-zone View of the Co-citation Network of CIS (International)

Figure 8. A Visualisation of Discipline Co-occurrence

The discipline co-occurrence knowledge map in Figure 8 indicates that while CIS research predominantly centers on linguistics, the trend towards interdisciplinary collaboration is increasingly evident, encompassing psychology, pedagogy, and neuroscience. Furthermore, CIS has progressively integrated with advanced techniques from the neuroscience discipline, with ERP and fMRI becoming widely utilized in the field. Specifically, the application of brain imaging technology to investigate the effects of interpreting activities on brain structure and function has emerged as a research hotspot (Wang, 2014; Van de Putte et al., 2018). Globally, CIS is experiencing an empirical and cognitive turn. The use of corpora, eye-tracking, ERP, and brain imaging technologies in Chinese research has seen considerable growth in recent years, supported by a diverse methodological toolkit (Garc á et al., 2016). Neuropsychological assessments of bilingual individuals with brain lesions can illuminate the functional autonomy of translation-related processes. Hemodynamic techniques, such as fMRI and positron emission tomography (PET), provide insights into the critical regions and networks underpinning these processes. Analyses of ERPs derived from electroencephalographic (EEG)

recordings reveal the temporal dynamics of crucial target mechanisms. At the same time, functional connectivity metrics demonstrate the integration or segregation of task-related activity across different cortical areas. Additionally, interpreting mechanisms can be modulated through invasive and non-invasive brain stimulation methods. Collectively, these tools offer a multidimensional view of CIS.

Each research method has its strengths and limitations. For example, EEG can measure factors intimately connected to CIS, such as lexical density, syntactic fluency, paralanguage, cognitive load, working memory, and long-term memory, with the advantages of high temporal resolution and real-time imaging. However, the weak brainwave signals during interpreting often necessitate numerous experiments to obtain valid data. EEG research has inherent challenges, such as unclear indices, artifact rejection, low spatial resolution, and the complexity of experimental design and data interpretation. In contrast, fMRI and other brain imaging technologies provide high spatial resolution, accurate spatial localization, and consistent judgment indices. Nevertheless, these methods' low temporal resolution and high equipment cost are limitations.

The analysis indicates that international studies have placed considerable emphasis on sign language interpreting, which has received less attention in Chinese research. Source language comprehension and student interpreters have become prominent research topics in China. The frequent selection of student interpreters as research subjects reflects the significance of interpreter training and the challenges associated with recruiting professional interpreter samples in CIS.

In summary, the timeline analysis underscores the dynamic nature of CIS, with a clear trend toward empirical and cognitive approaches. Integrating diverse methodologies and technological advancements shapes the field as researchers seek to deepen their understanding of the cognitive processes involved in interpreting. The interdisciplinary nature of CIS is also evident, with contributions from neuroscience, psychology, and pedagogy enriching the linguistic core of the field. This convergence of disciplines facilitates the exploration of new frontiers in interpreting research, particularly in brain plasticity and cognitive control mechanisms.

4.4 Research Power Analysis

The knowledge maps provided below offer a visualization of the scientific collaboration network in Cognitive Interpreting Studies (CIS) at three levels: scholar cooperation (micro-view), institutional cooperation (medium-view), and national or regional cooperation (macro-view). These maps illustrate the research influence within CIS, with the size of nodes corresponding to the number of articles published by authors, institutions, countries, or regions. An analysis of the number of articles published in international journals reveals that Chinese scholars are the most prolific, followed by their American, British, Spanish, and Belgian counterparts. However, it is essential to recognize that more than publication volume is needed to fully represent the influence of Chinese scholars in interpreting cognition, especially considering China's large population base.

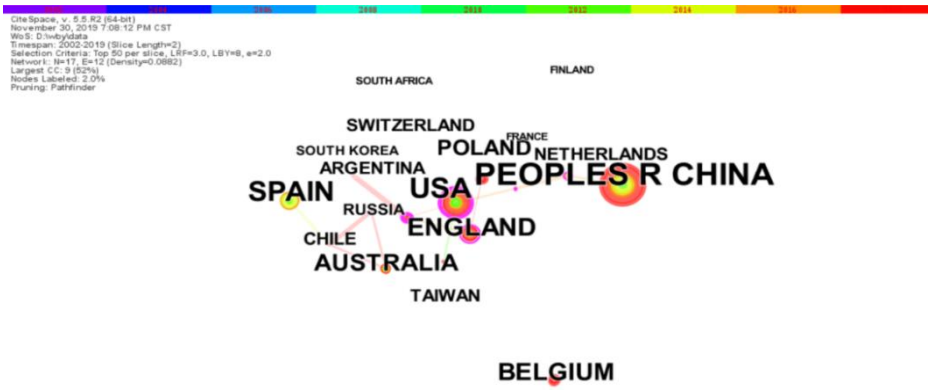

Figure 9. A Visualisation of the Country Collaboration Network (International)

The research influence analysis highlights the prolific nature of specific regions and scholars and emphasizes the significance of international collaboration. The country collaboration network (Figure 9) reveals the interconnectedness of research efforts across borders, underscoring the global nature of CIS as a discipline. This international cooperation is pivotal for the cross-fertilization of ideas and the advancement of collective knowledge.

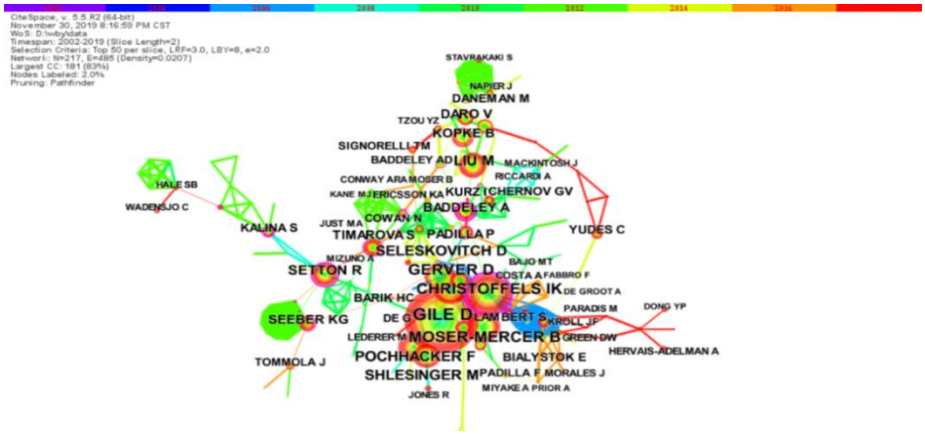

Figure 10. A Visualisation of Author Co-citation Network (International)

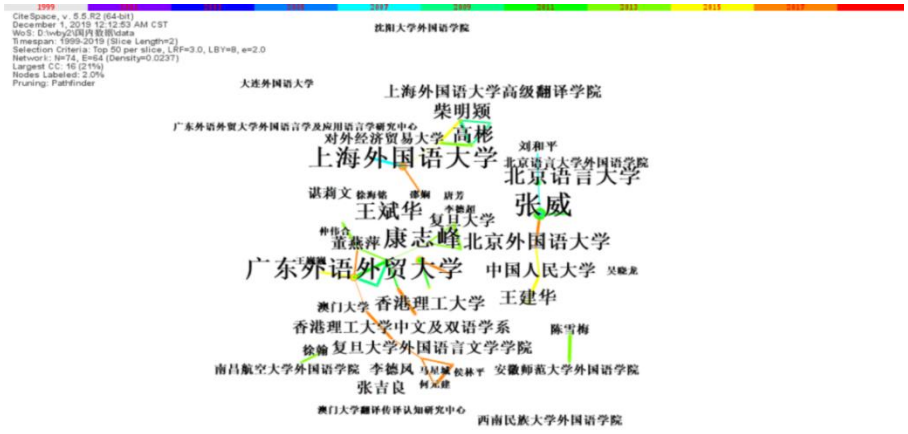

Figure 11. Author and Research Institution Co-occurrence Network (China)

The author co-citation network (Figure 10) and the author and research institution co-occurrence network (China) (Figure 11) further illustrate the relationships between fundamental researchers and institutions, providing a snapshot of the intellectual structure of CIS. These networks demonstrate the clustering of scholarly communities around influential theories and models, which continue to inform current research and practice. In China, notable scholars in CIS include Zhang Wei from Beijing International Studies University, Wang Jianhua from Renmin University of China, Kang Zhifeng from Fudan University, and Li Defeng from the University of Macau. Zhang (2011) developed a working memory model for SI, Kang (2011) systematically studied interpreting anxiety, and Wang (2015) focused on metacognitive processes in interpreting. The author co-citation network in Figure 10 highlights Seleskovitch, Lederer, Gerver, Massaro, Moser, and Gile as highly cited authors in CIS. The interpreting process models they proposed, such as the triangular model of the interpreting process (Seleskovitch & Lederer, 1984), the SI process model (Gerver, 1976; Lederer, 1981), the discourse comprehension model (Massaro, 1978), the SI information processing model (Moser, 1978), and the effort model (Gile, 1983), have had a significant and lasting impact on the field of interpreting studies.

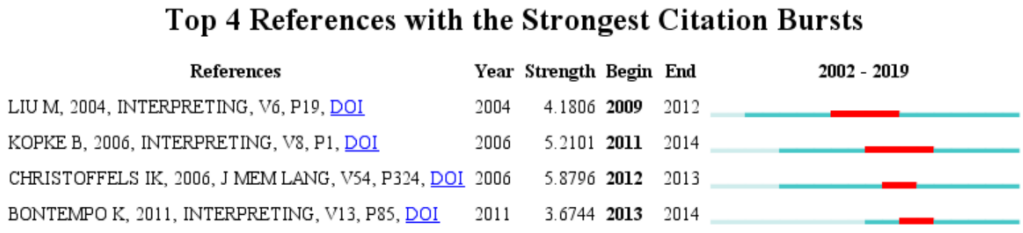

Figure 12. A Visualisation of the References with the Strongest Citation Bursts

The visualization depicted in Figure 12, which identifies the references with the most pronounced citation bursts, serves as a compelling barometer of shifting research paradigms and encapsulates their scholarly resonance across the international academic landscape. To elucidate, Liu et al. (2004) delved into the disparities in English-Chinese simultaneous interpreting (SI) proficiency between student and professional interpreters, deducing that the salient differentiator lay not in the realm of working memory capacity but in the domain of expertise, with a particular emphasis on bilingual transformation skills. Christoffels et al. (2006) probed the nexus between working memory capacity and language processing competencies in interpreters and bilingual individuals, uncovering that working memory is a cornerstone of the SI process and that simultaneous interpreters possess a more refined bilingual processing acumen than their bilingual counterparts. Köpke and Nespoulous (2006) discerned no marked divergence in short-term memory across student interpreters, professional interpreters, bilinguals, and college students. Bontempo and Napier (2011) scrutinized the influence of cognitive faculties and personality dimensions on interpreting performance, positing that emotional stability is a potential harbinger of interpreters' self-evaluation of their competencies.

Collectively, these pivotal studies underscore the intricate interplay between cognitive capabilities,

language proficiency, and personal attributes in interpreting performance. The insights gleaned from this body of work advance our understanding of the cognitive underpinnings of interpreting and informing pedagogical strategies and professional development within the field. As the discourse on interpreting studies evolves, these findings will serve as foundational reference points for future empirical inquiries and theoretical explorations.

In synthesizing these analyses, it becomes clear that the field of CIS is characterized by a rich tapestry of research endeavors, with a diverse array of contributors driving the field forward. The research influence analysis provides a multifaceted landscape view, revealing the depth and breadth of scholarly activity within CIS. As the field continues to mature, it is incumbent upon researchers to build upon the foundational works identified in the citation analysis, engage in meaningful collaborations, and contribute to the ongoing dialogue that defines the discipline.

5. Conclusion

A retrospective analysis of the seminal literature in Cognitive Interpreting Studies (CIS) over the past two decades delineates the evolution of research priorities, encompassing interpreting pedagogy, language comprehension, and working memory. At each historical juncture, the literature has concentrated on interpreters' psychological states and cognitive abilities while pioneering new methodologies to investigate the cognitive processes underpinning interpreting—the proverbial "black box." As the field has matured, the focal points and research frontiers have shifted accordingly.

In the Chinese context, researchers have honed in on language chunks, source language comprehension, cognitive models, comprehension in interpreting, interpreting studies, interpreter training, interpreting pedagogy, contextual factors, and the experiences of student interpreters. Conversely, international scholars have predominantly engaged with topics such as conference interpreting, functional magnetic resonance imaging (fMRI), simultaneous interpreting, corpus analysis, critical thickness, interpreters, eye-tracking, sign language interpreting, and consecutive interpreting. This divergence underscores a broadening understanding of interpreting cognitive processes, information processing mechanisms, and research methodologies.

It is projected that fMRI, simultaneous interpreting, corpus-based studies, eye-tracking, and sign language interpreting will emerge as burgeoning research trends within CIS. Pöchhacker (1995) identified five pivotal factors—manpower, motivation, material, methods, and market—that are instrumental in driving the progress of interpreting studies. These "five Ms" encapsulate the essential elements for the field's development: academic positions and programs, career prospects and incentives for research, access to authentic data and professional subjects, established and tailored research paradigms, and external demand, including sponsorship for interpreting research.

Given the rapidly expanding interpreting market, the surging interest in cognitive aspects of interpreting, the proliferation of interpreter training programs, and a conducive academic milieu, it is reasonable to anticipate further consolidation and growth in CIS. This optimistic outlook suggests that

the field will continue to yield substantial and insightful research contributions in the future.

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