BILINGUAL PUBLISHING GROUP

Forum for Linguistic Studies

https://journals.bilpubgroup.com/index.php/fls

ARTICLE

Mapping Multimodal Linguistics Research: A CiteSpace Bibliometric Analysis

Yan Lu

School of Foreign Languages, Guangzhou Huashang College, Guangzhou 511300, China

ABSTRACT

Using a bibliometric analysis with CiteSpace, this paper examines the current state and developmental trends of multimodal linguistics research, focusing on 2536 references from the Web of Science database from 2013 to 2023. The study also considers publication trends, top countries, universities and authors, as well as the frequency of most cited journals and literature, research topics and emerging hotspots. The results show that the field of multimodal research has grown rapidly over the last ten years, with an average annual growth rate of 38% and a peak of 435 publications in 2023, demonstrating its rapid expansion in linguistics. Research hotspots include multimodal discourse analysis, visual grammar, multimodal pedagogical applications, social semiotics and multimodal cognition and perception. The field exhibits strong interdisciplinary characteristics, such as the integration of social semiotics with cognitive linguistics and the application of digital technologies. It can be stated that multimodal research is developing into a more integrated and interdisciplinary approach, reflecting the complex and dynamic nature of communication in today's world. Future research should focus on cross-cultural variations in modal usage, the construction of multimodal grammatical systems, and innovative applications in educational contexts. This research provides quantitative evidence for understanding the knowledge map of multimodal studies, offering insights for future research directions and methodological advancements.

Keywords: Multimodality; Linguistics; CiteSpace; Research Hotspots; Research Trends

*CORRESPONDING AUTHOR:

Yan Lu, School of Foreign Languages, Guangzhou Huashang College, Guangzhou 511300, China; Email: 287047544@qq.com or luyan@gdhsc.edu.cn

ARTICLE INFO

Received: 28 May 2025 | Revised: 30 June 2025 | Accepted: 7 July 2025 | Published Online: 25 July 2025
DOI: https://doi.org/10.30564/fls.v7i8.10243

CITATION

Lu, Y., 2025. Mapping Multimodal Linguistics Research: A CiteSpace Bibliometric Analysis. Forum for Linguistic Studies. 7(8): 88–106. DOI: https://doi.org/10.30564/fls.v7i8.10243

1. Introduction

The origins of multimodal theory can be traced back to the 1970s. Halliday proposed social semiotic theory of communication in 1978 which emphasizes understanding different modes of communication from a social perspective. O'Toole published his book *The Language of Displayed Art* in 1994 and proposed that observers can simultaneously extract three types of meanings: representational, modal, and compositional in his book[1]. This foundational work laid the groundwork for the burgeoning field of multimodality, which in the 1990s began to intersect with discourse analysis, culminating in the influential text by Kress and Van Leeuwen – *Reading Images: The Grammar of Visual Design*. This text has been pivotal in structuring the work of many multimodal researchers, particularly those concerned with visual communication[2].

Over the past two decades, the multimodal research domain has diversified, giving rise to various schools and research trajectories. Van Leeuwen & Kress identified four linguistic schools that contributed to 20th-century multimodal research: the Prague School, which extended linguistics to non-verbal aspects of visual arts and theater in the 1930s and 1940s[3]; the Paris School of semiotics, applying structuralist linguistics to popular culture and mass media[4]; the American school focusing on spoken and nonverbal communication in the 1960s and 1970s; and the social semiotic school of Halliday's Systematic Functional Linguistics, which first employed the term "social semiosis" to describe the meaning-making process of communication[5]. O'Halloran further identified social semiotics, interactional sociolinguistics, and cognitive linguistics as the three most active schools within multimodal discourse analysis[6]. In addition, other scholars have integrated these three traditions with other theories to develop five additional analytical approaches: geosemiotics, multimodal interaction analysis, multimodal ethnography, multimodal corpus analysis, and multimodal perceptual analysis[7].

Despite the rapid expansion of multimodal research, there is a need for a systematic understanding of its evolution. However, the number of review articles on this topic remains limited. As of January 25th, 2024, the Web of Science indexed only 51 review articles on multimodality, the majority of which are book reviews. Nash's review of multimodal writing instruction in secondary English courses from 2007 to 2017 highlighted the diverse implementations of multimodality in writing instruction and their impact on student experiences[8]. Lim, Toh, and Nguyen's qualitative thematic analysis of 98 articles revealed five common themes in multimodal education, including student engagement with multimodal texts, the use of critical and creative pedagogies, explicit teaching of multimodal literacy, the role of affect in learning, and concerns over multimodal assessment[9]. These themes were discussed in relation to existing review studies focusing on multimodality in English language classrooms.

The current body of research on the application of multimodality in linguistics is limited, with the majority of studies focusing on educational contexts, which may not provide an objective or comprehensive view of multimodality research. Moreover, traditional reviews face challenges in compiling, generalizing, and quantitatively assessing the evolution of a specific domain within a diverse array of research topics. Therefore, a broader overview is needed to describe the major trends in the field, critically discuss its focus, and situate it within the broader landscape of multimodality applications in linguistics.

Bibliometric analysis offers a quantitative approach to assess and analyze the scholarly literature within a specific domain, revealing the intellectual structure and evolutionary trends of research topics. CiteSpace, developed by Chen, is a widely recognized bibliometric tool that facilitates the visualization of scientific knowledge and the identification of research hotspots and frontiers[10]. This tool supports a comprehensive suite of analyses, such as reference journal analysis, which aids scholars in discerning current and emerging research trends in their field of interest[10,11]. CiteSpace's capabilities extend beyond mere visualization, providing researchers with the means to conduct both quantitative and qualitative analyses of scientific subject domains with greater ease and insight[10]. The tool employs various algorithms to map the knowledge structure over time within a large number of bibliographic records, detecting emerging trends and patterns that might otherwise remain obscured[12]. This enables researchers to not only trace the historical development of a discipline but also to forecast its future trajectory by identifying the most influential publications, authors, and institutions[13,14]. CiteSpace is an indispensable tool for bibliometric analysis, offering a comprehensive platform for

scholars to navigate the complex landscape of scientific literature and to identify key trends and developments in their field of study. This paper uses the latest version of CiteSpace 6.3.R1 for literature analysis and presentation.

The research questions are as follows:

RQ1: What are the publishing trends in the field between 2013 and 2023?

RQ2: Which nations, universities, and authors have been actively engaged in multimodal research?

RQ3: Which journals are cited most frequently in multimodality and which form the research arena of the field?

RQ4: Which references are quoted the most often in multimodal research?

RQ5: What are the most frequently discussed research topics and hotspots? and

RQ6: What is the development trend of multimodality research?

2. Data and Methodology

The study adopts a mixed-methods framework, integrating quantitative bibliometric analysis with qualitative interpretive approaches.

2.1. Data

The data in this research were carefully selected from the Web of Science Core Collection (WoSCC) Database, accessed via the Clarivate Analytics platform on February 3, 2024. The database is a comprehensive repository that encompasses a wide range of international academic journals featuring articles on multimodality applications on linguistics. The WoSCC database boasts over 9000 highly regarded academic journals, solidifying its reputation and significance within the global academic community. In addition to its extensive bibliography, it offers researchers top-notch quality, minimal redundancy, and seamless compatibility of document information, greatly facilitating data collection and analysis. The following steps were taken to ensure a systematic and transparent data collection process:

1. Search Strategy:

The data retrieval approach employed for this research involved the following search strategy: articles were identified using the subject "multimodality" with a time frame limited to entries from 2013 to 2023. The corpus source was narrowed down to the Social Science Citation Index (SSCI) and the Art and Humanities Citation Index (A & HCI). The specific criteria and methodologies for the search are listed as follows:

Search terms: Topic = multimodality OR multimodal (in titles, abstracts or keywords);

Time span: 2013–2023 (inclusive);

Document type: Limited to "Article" to exclude conference proceedings and editorials;

Language: English

Research area: linguistics OR language linguistics (via WoS category filtering).

2. Data extraction:

After initial retrieval, a two-stage filtering process was implemented:

Stage 1 (Automated): Duplicate records were removed through the use of the "Remove Duplicates" function of CiteSpace 6.3.R1, which identifies duplicates based on title, author list, and publication year.

Stage 2 (Manual): The author manually screened documents to exclude:

Conference abstracts, book reviews, and correspondence (identified via document type labels in WoS);

Articles unrelated to multimodal linguistics (e.g., studies focusing solely on unimodal communication or non-linguistic applications), confirmed by reading titles and abstracts.

3. Data verification:

To ensure data integrity, the final dataset was validated for:

Completeness of bibliographic information (e.g., author names, publication years, journal titles);

Consistency of keyword indexing (verified against WoS's subject category assignments).

After cleaning, the dataset comprised 2,536 unique articles, representing a 99.6% retention rate post-duplicate removal.

2.2. Methodology

This study is mainly based on the information visualization tool CiteSpace, which has been known for its diverse, temporal, and dynamic functions since its development in 2006. CiteSpace assists in the exploration of scientific literature by creating visual representations of knowledge, enabling

researchers to identify patterns and tendencies in specific academic fields. In this study, CiteSpace was used to generate visualizations, which included several important factors such as the number of academic publications, productivity of lead authors, institutional and national contributions, and general citations of references and journals. In addition, the tool also studied the sudden increase in simultaneous occurrences of keywords, keyword clusters, and keyword citations, providing a complete perspective on the research field.

The following steps were taken to conduct the analysis:

1. Data import:

The cleaned dataset was imported into CiteSpace, selecting the "full record and cited references" option to enable a detailed analysis of the citation network.

2. Time slicing:

Data were partitioned into 1-year intervals (2013–2023) to capture annual research trends. This approach allowed for the detection of emerging trends and patterns.

3. Threshold settings:

For co-authorship and institutional analysis: Top 50 nodes per slice (to prioritize high-productivity entities);

For keyword co-occurrence: Minimum frequency of 5 occurrences, with pruning of merged networks to reduce redundancy;

4. Validation:

All visualizations (e.g., co-citation networks, keyword clusters) were cross-checked with raw data to ensure accuracy.

These steps not only improve the clarity of visualization, but also ensure that the generated knowledge map accurately reflects the development trends and fundamental issues in the field of multimodal transport research. By adopting this rigorous approach, this study aims to gain a better understanding of the current status and future directions of multimodal research in linguistics.

3. Results and Discussion

The global distribution of publications related to multimodality in the field of linguistics from 2013 to 2023 is presented in **Figure 1**, which provides a comprehensive view of the research output over this decade. This visual representation of the cumulative publication per year serves as a proxy for measuring the trajectory of scholarly interest, the accretion of intellectual capital, and the general progression towards a mature field of study.

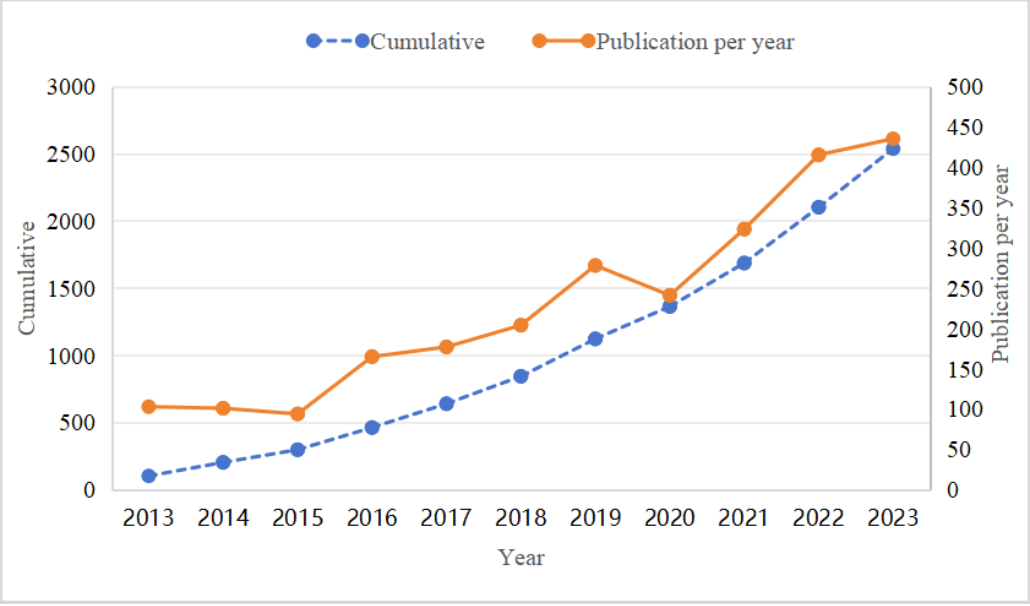

Figure 1. Annual Publications Involving Multimodality in WoS.

Observably, the graph illustrates a generally upward trend in the annual output of multimodal research, beginning with 103 publications in 2013 and culminating in a substantial peak of 435 in 2023. This decade-long trajectory underscores the escalating academic engagement with multimodality as a significant area of linguistic inquiry.

A closer examination of the data reveals an initial period of moderate activity from 2013 to 2015, with a small drop in the number of publications, indicating perhaps a period of consolidation or just taking a short break in research focus. However, this trend was succeeded by a remarkable upsurge after 2015, suggesting a resurgence of interest and a subsequent surge in scholarly contributions. The year 2019 stands out with a notable peak, signifying a period of intensified research activity. Despite a brief downturn in 2020, the field rebounded robustly in 2021, with 82 more publications increase over the preceding year. This shows that research in this area can bounce back quickly and grow. The highest point so far was in 2023, with a total of 435 publications. Although the growth rate in 2023 showed a slight deceleration compared to the two preceding years, the field is still growing and developing very well.

Based on the data, the average annual growth rate of multimodal publications from 2013 to 2023 was about 38%. This robust growth rate shows that research in this area is not only thriving but also expanding its scope and influence within the broader discipline of linguistics. The steady upward trend reflects a fast-growing interest in multimodality, highlighting its significance as a vibrant and evolving domain of scholarly pursuit.

3.1. Analysis of Most Prolific Authors, Institutions, and Countries

The co-authorship maps and institutional networks depicted in **Figure 2** provide a visual representation of the scholarly connections and collaborative efforts within the multimodal studies field, shedding light on the research productivity and academic advancements of the domain. These visual analytics tools are instrumental in identifying the key contributors and their collaborative networks, which are crucial for understanding the evolution and impact of research in multimodality.

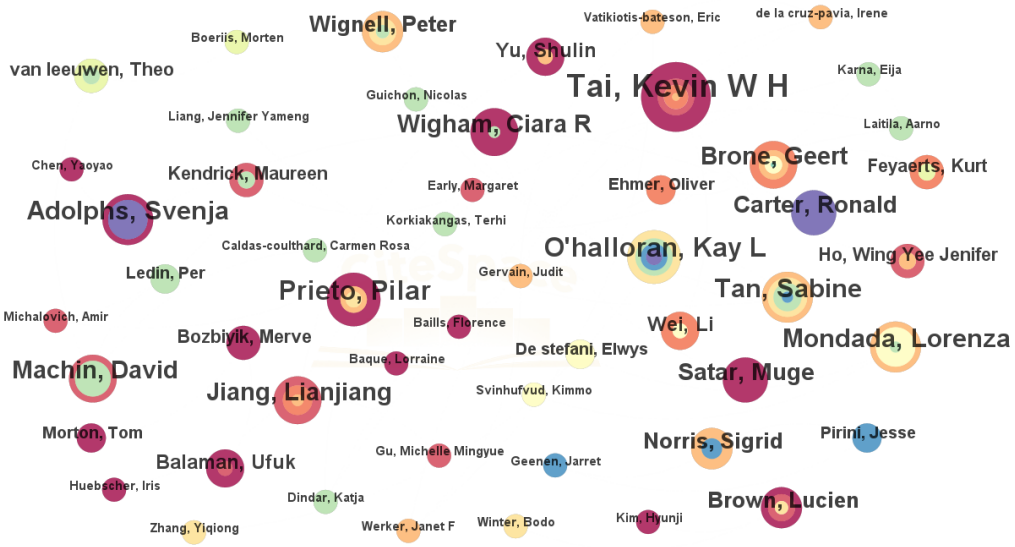

Figure 2. Network Analysis of Authors in Multimodal Studies from 2013 to 2023.

As illustrated in **Figure 2**, which is derived from the data presented in **Table 1**, Kevin W. H. Tai is the most prolific author in the field of multimodality, with a total of 17 publications between 2013 and 2023. His work, which predominantly employs multimodal conversation analysis, has significantly contributed to the understanding of classroom interactions and the integration of linguistic and multimodal resources in educational settings. For example, Tai studied how an EMI history teacher deploys available linguistic and multimodal resources to connect students' responses with academic concepts and terminologies[15]. The classroom interaction data is examined by using Multimodal Conversation Analysis.

Kathy A. Mills, Gregory Matoesian, Fei Victor Lim, and Kristin Enola Gilbert, each with 11 publications, are in second place in terms of productivity within the same time frame. Their research, though diverse in focus, collectively enriches the multimodality discourse. Mills' work explores

the connections between multimodality and educational practices, while Lim delves into the analysis of various discourse types, including classroom and digital news discourse. Matoesian and Gilbert have frequently collaborated, with their research often centering on the linguistic analysis of legal language.

Table 1. Top 10 Most Productive Authors in Multimodal Studies from 2013 to 2023.

Rank	Count	Year	Authors
1	17	2020	Tai, Kevin W H
2	11	2016	Mills, Kathy A
3	11	2018	Matoesian, Gregory
4	11	2021	Lim, Fei Victor
5	11	2018	Gilbert, Kristin Enola
6	10	2019	Prieto, Pilar
7	10	2016	Hiippala, Tuomo
8	9	2014	Tan, Sabine
9	9	2016	Mondada, Lorenza
10	9	2019	Norgaard, Nina

In addition to these leading figures, other notable authors have also made significant contributions to the field of multimodality. Pilar Prieto, Kay L. O'Halloran, and Tuomo Hiippala, among others, have published influential papers that further our understanding of multimodal communication and its applications. Their research is listed in **Table 1**, which provides a comprehensive overview of the top 10 most productive authors in multimodal studies from 2013 to 2023.

The global distribution of multimodal research from 2013 to 2023, as presented in **Figure 3**, exhibits an uneven pattern with respect to the productivity of countries. The United States significantly leads, accounting for 506 articles, which is approximately one-fifth of the total global output. Among these, a notable contribution comes from the University of California System, which has published 46 articles. Following the United States, the United Kingdom, China, and Spain are identified as key contributors, with 297, 269, and 248 articles published, respectively. The combined output of these four countries constitutes 52% of the total 2536 publications in the field.

Figure 3. Network Analysis of Countries in Multimodal Studies from 2013–2023.

Geographically, the most productive countries are predominantly located in Europe and North America. China leads the way in Asia, with an average annual output of 26 publications, totaling 269 articles. Other Asian nations, such as Japan (51 articles), Singapore (45 articles), and South Korea (31 articles), have also emerged as significant contributors to the field of multimodal studies.

Research collaboration is a critical aspect of scientific advancement, involving scholars from different backgrounds working together to generate new knowledge. When different authors, institutions, or countries/regions appear simultaneously in a paper, it can be considered as a cooperative relationship[16]. As indicated in **Figure 3**, the size of the nodes, the connections between them, and the density of these connections suggest that scholars from the United States, the United Kingdom, China, Spain, Australia, and Germany en-

gage in extensive and deep cooperation with each other and with scholars from other nations in the realm of international scientific research. Scholars from Finland, Canada, Sweden, and France also exhibit a notable level of international collaboration.

Overall, the international scholarly community exhibits a relatively close cooperation, forming numerous effective networks. However, the scope of collaborating countries remains limited, indicating ample room for expansion. The extensive development of international cooperation is pivotal to elevating the caliber of scientific research. Given the interdisciplinary nature of multimodal research, it necessitates collaborative efforts between scholars and institutions from diverse disciplinary backgrounds and countries.

To foster further advancements in multimodal research, international scholars should leverage their research strengths, focus on pursuing high-level research objectives, establish connections with other significant international research institutions and scholars, and thereby enhance the global collaborative efforts in this field.

Figure 4 vividly illustrates the intricate network of institutional collaborations in the field of multimodality research, highlighting the formation of distinct clusters that represent the synergy between various research institutions. This visual representation is a testament to the global nature of scholarly communication and collaboration. **Table 2** highlights the significant contributions made by some institutions to multimodal publications between 2013 and 2023. Universities in several countries are at the forefront of this research, with the University of Hong Kong leading the way with 36 papers, followed by the University College London with 35 articles, and University of Jyväskylä with 33 articles.

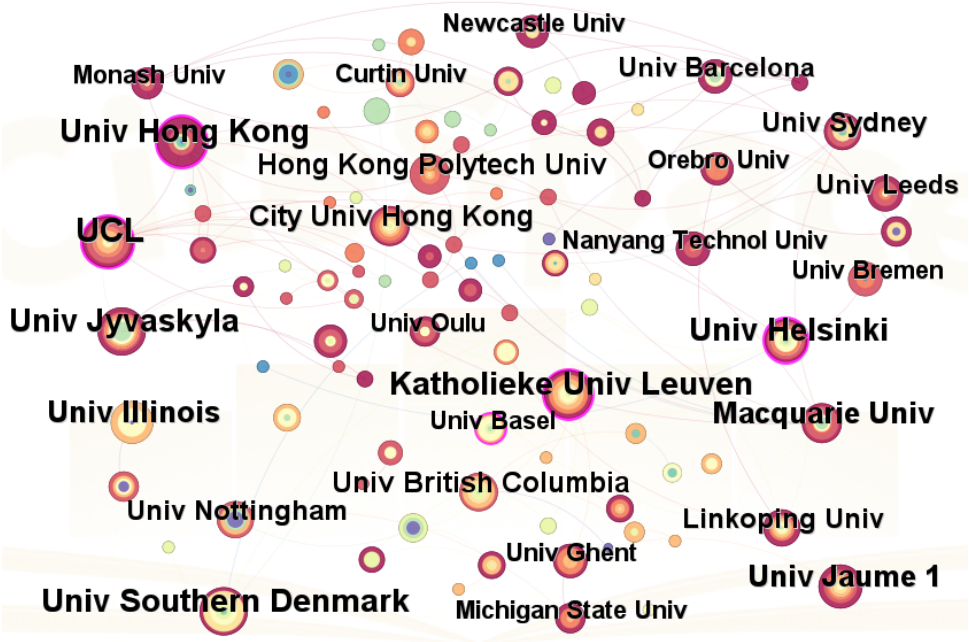

Figure 4. Network Analysis of Institutions in Multimodal Studies from 2013 to 2023.

Table 2. Top 10 Institutions of Multimodal Studies from 2013 to 2023.

Rank	Count	Centrality	Year	Institutions
1	36	0.1	2013	Univ Hong Kong
2	35	0.2	2015	UCL
3	33	0.07	2013	Univ Jyvaskyla
4	30	0.19	2013	Univ Helsinki
5	30	0.03	2014	Univ Southern Denmark
6	30	0.13	2017	Katholieke Univ Leuven
7	24	0.01	2018	Univ Jaume 1
8	23	0.07	2013	Hong Kong Polytech Univ
9	23	0.03	2014	Macquarie Univ
10	22	0.01	2013	Univ Illinois

The University College London's centrality score of 0.2 and the University of Helsinki's centrality score of 0.19 indicate that they play a central role in the multimodal research community. These high scores of centrality reflect their prolific publications and extensive collaborative networks covering a wide range of research topics and methods. The University of Southern Denmark and the Katholieke Universiteit Leuven also stand out for their significant contributions to the field, with 30 publications each.

The faculty at the University of Hong Kong has been particularly active in the field of multimodality, with a number of publications focusing on the themes of language learning, digital activism and the integration of technology in education. These publications are consistent with the growing importance of multimodality in educational practice and the role of technology in facilitating learning.

The interdisciplinary nature of multimodality requires the cooperation of researchers and research institutions from different disciplinary backgrounds and countries. Therefore, it is important that international researchers build on their own research strengths, focus on the pursuit of high-level research objectives, and establish links with other major international research institutions and researchers to facilitate the development of multimodal research.

3.2. Analysis of Cited References, Authors and Journals

Documents that are cited frequently are important repositories of knowledge in the field of study, reflecting the depth of the research and its evolutionary trajectory. The frequency with which these documents are cited gives an indication of the scholarly influence and enduring importance of the referenced work. A document is co-cited when a citation from one document is also used in another document. The citation frequency of literature serves as a crucial metric to assess the impact of scholarly works. The higher the citation frequency, the greater the reference value of the literature[17]. Therefore, through co-citation analysis, important works and influential articles in the field can be quickly identified and research trends and hotspots can be effectively inferred. **Figure 5** provides a visual representation of the most frequently cited literature on the application of multimodality in linguistics. As can be seen, Mondada's work appears as the central node and is cited multiple times over different years, indicating the influence of his research on this topic. This suggests that his contributions are fundamental and continue to influence the development of research in this area. Similarly, Goodwin's publications from 2013 to 2018 are prominently displayed, highlighting their significant contributions to the field. The presence of multiple works by the same author in the co-citation network highlights the depth and breadth of their scientific impact. Other notable authors with high co-citation frequency include Blackledge (2017), Deppermann (2013), and Kress Gunther (2010), whose work has also played a role in shaping the discourse in the field. The accumulation of citation counts around these authors suggests a concentration of influential research that has paved the way for further research. The co-citation network presented in **Figure 5** reveals not only the key researchers and their pioneering publications, but also the interconnections of various studies in the field of linguistics. This visual representation of academic influence can guide future research directions and help identify the seminal works that continue to influence the direction of the field.

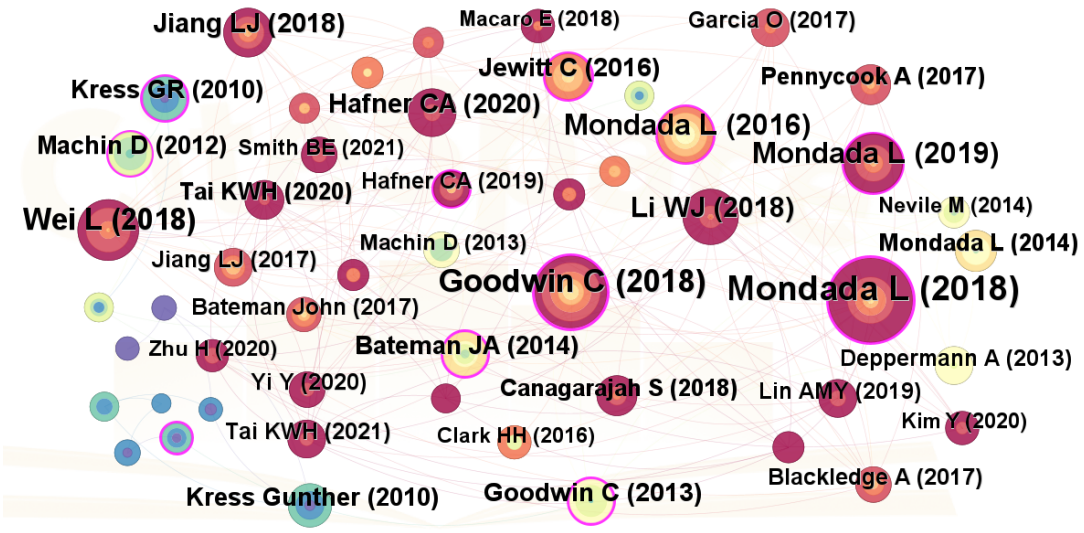

Figure 5. Visualization Map of Co-Citation References in Multimodal Studies.

The classic academic journals that have garnered the most frequent citations in the field of multimodality are noteworthy and deserve our attention. A visualization map depicting the most frequently cited journals in multimodality is presented below (**Figure 6**). By examining the co-citation network illustrated in **Figure 6**, we identify the top five most frequently cited journals in multimodality as follows: Journal of Pragmatics (860 citations), Applied Linguistics (435), Language (413), TESOL Quarterly (410), and The Modern Language Journal (405). Notably, the Journal of Pragmatics stands out with the highest number of citations in multimodality research (860), nearly constituting half of the total publications reviewed in this study, underscoring its pivotal role in the multimodal research domain.

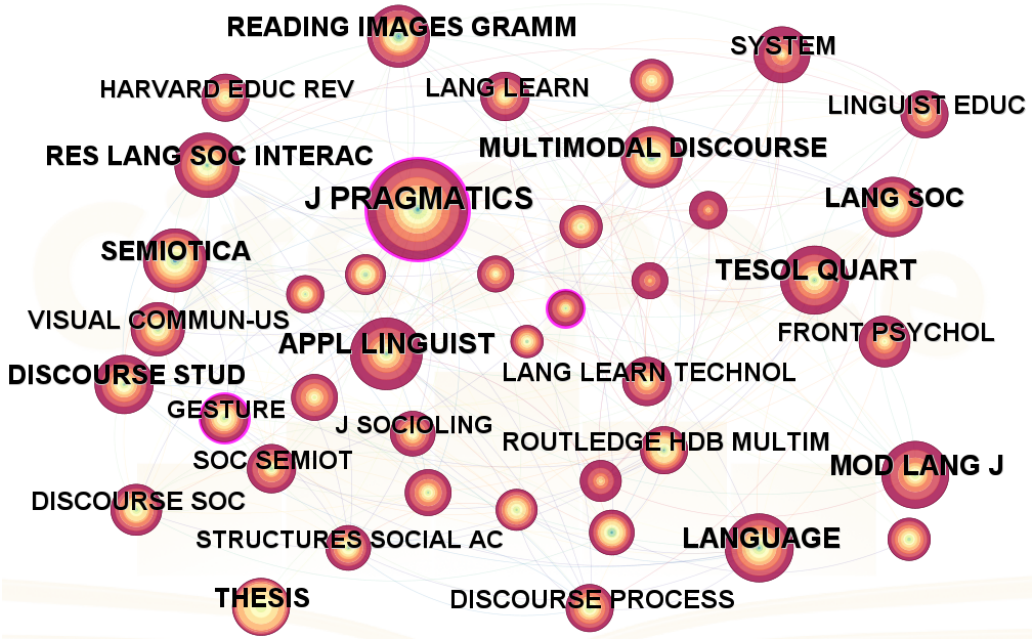

Figure 6. Visualization Map of Co-Citation Journals in Multimodal Studies.

These journals are intimately connected with linguistic studies and encompass a broad spectrum of linguistic disciplines, including pragmatics, semantics, discourse analysis, conversation analysis, ethnomethodology, interactional linguistics, sociolinguistics, linguistic anthropology, media studies, psychology, sociology, and the philosophy of language. This diversity underscores the interdisciplinary and multidisciplinary nature of multimodal research.

Furthermore, the number of publications in other notable journals in this field, such as Research on Language and Social Interaction (369), Semiotica (362), Multimodal Discourse (334), Language in Society (333), and Discourse Studies (311), all exceed 300. These international journals meet the demand for multimodal research and contribute to the expansion of the field.

These findings reaffirm the viability and rationality of multimodal research, highlighting its significance and the impact of these scholarly journals in shaping the discourse within the multimodality domain.

3.3. Main Sections and Hotspots

Keywords are the concentration and refinement of the core content of the article. The keywords in the essay mirror the essential aspects of the study area. Thus, research trends and cutting-edge topics can be identified by analyzing the co-occurrence and centrality of keywords [10]. **Figure 7** is the keywords co-occurence network for documents of linguistic research on multimodality. In the figure, node size and color depth indicate the significance of keywords. The larger the node, the darker the color, the higher the significance, and the more prominent the hot fields and topics of multimodal research. As can be seen intuitively from **Figure 7**, "language" received a large amount of attention; English, organization, conversation analysis, discourse, literacy and communication have also been receiving increasing attention. Besides, the centrality of a node is a graph-theoretical

property that quantifies the importance of the node's position in a network[10]. A higher centrality value is indicative of a more profound influence on the evolution of multimodality, as well as the importance of keywords in connecting various research topics. **Table 3** reveals that keywords such as "language", "discourse", "communication", and "acquisition" exhibit the highest centrality, trailed by "English", "learners", "literacy", "classroom", "children", "perception", and "construction". These findings encapsulate the subjects that have been most extensively explored and their critical role in forging connections between the multimodality field and a myriad of other areas and domains. However, relying solely on keywords to capture the subtleties of an academic field falls short, as it neglects the substantial influence that the timeliness of publications can have. To address this limitation, we employed a cluster analysis of keywords, which facilitated the identification of emerging research trends and cutting-edge investigations in multimodality. This approach not only enhances our understanding of the current state of multimodal research but also illuminates the pathways for future scholarly inquiry. The profile of a specific field can be examined via keyword cluster analysis[18,19].

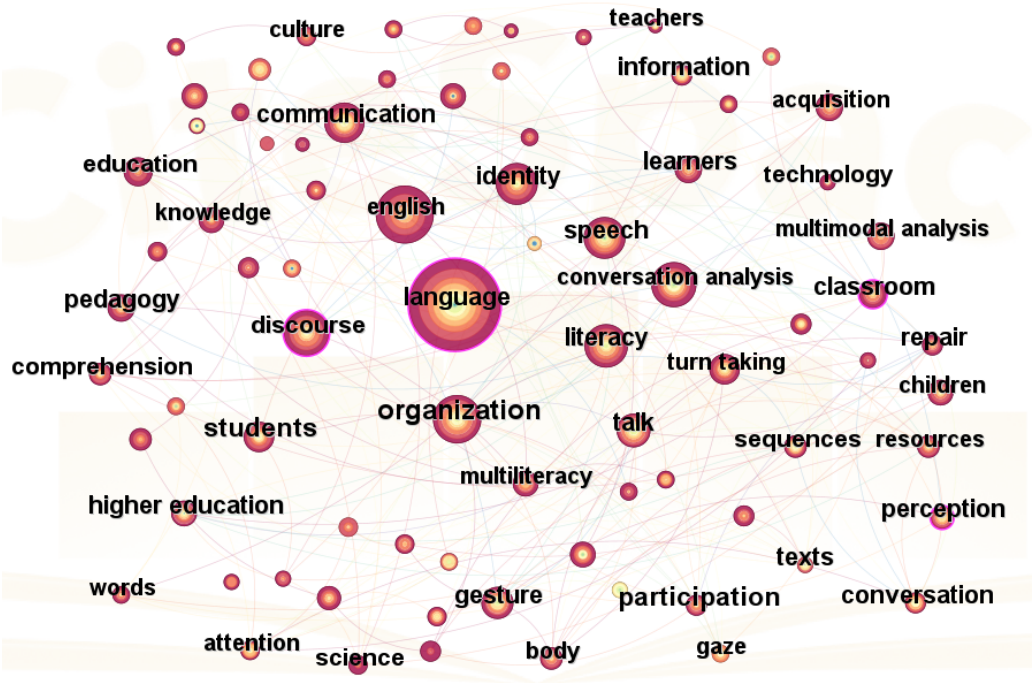

Figure 7. Co-occurrence of Keywords in Multimodal Studies.

Table 3. Top Fifteen Keywords Based on Their Frequency.

Rank	Count	Centrality	Keywords
1	409	0.2	language
2	176	0.07	English
3	152	0.04	organization
4	130	0.05	Conversation analysis
5	130	0.11	discourse
6	113	0.06	literacy
7	104	0.11	communication
8	97	0.04	identity
9	94	0.05	speech
10	82	0.04	talk
11	65	0.04	gesture
12	60	0.02	multimodal analysis
13	57	0.05	students
14	56	0.06	classroom
15	55	0.02	education

Table 4 reports the detailed information of the twelve largest clusters, whose labels were selected by their citers based on the tf*idf term ranking algorithm, which tends to represent the most salient aspect of a cluster[11]. The table offers detailed insights into the size, label, silhouette, and top 10 terms for each cluster, which allows for a more nuanced understanding of the research areas. In the context of this study, the modularity Q measures the extent to which a network can be divided into independent blocks, i.e., modules[20,21]. The modularity score ranges from 0 to 1. A low modularity suggests a network that cannot be reduced to clusters with clear boundaries, whereas a high modularity may imply a well-structured network[11]. The silhouette value of

a cluster measures the quality of a clustering configuration. Its value ranges between −1 and 1, with 1 representing a perfect solution. The silhouette values of the ten major clusters presented in **Table 4** were mostly close to 1, indicating that the clustering configurations are appropriate. However, to ensure a sound interpretation in CiteSpace, both the modularity and silhouette scores should be taken into account when interpreting the results[11]. The resulting modularity (Q) value is close to 1 ($Q = 0.76$, $0 < Q < 1$), indicating dense connections between the nodes, and a high weighted mean silhouette ($S = 0.9$, where $-1 < S < 1$) signifies a strong correspondence between the object and its corresponding cluster.

Based on all the data, there comes a comprehensive overview of the research hotspots in multimodality from 2013 to 2023:

The first is interdisciplinary integration of multimodal frameworks (**Figure 8**). "Social semiotics" (Cluster #4) and "cognitive linguistics" (Cluster #9) highlight the merging of theoretical approaches. Social semiotics examines how multimodal resources construct meaning in sociocultural contexts. For instance, it helps analyze the meaning-making process of multilingual children in immigrant families through various modalities like language, gesture, and visual cues. Zhao and Flewitt, in their study, revealed how young Chinese immigrant children leverage their multilingual, multimodal, and multisemiotic repertoires on social media, interacting with distant relatives and friends[22]. Their findings underscore the importance of social media in enriching opportunities for emergent translanguaging practices and heritage language learning among children. Conversely, cognitive linguistics focuses on the cognitive processing of multimodal information. Research in this area might involve investigating how individuals comprehend and produce multimodal expressions in virtual exchanges, considering aspects such as lexical and structural alignment. Tai et al. harnessed the power of VR technology to enhance EFL learners' vocabulary acquisition, revealing that immersive learning significantly bolstered retention compared to traditional video methods[23]. This study exemplifies the cognitive benefits of multimodal approaches, underscoring the importance of aligning educational strategies with the cognitive mechanisms that govern multimodal communication. By integrating cognitive linguistics with cutting-edge technology, we can foster a deeper understanding of the cognitive processes that drive comprehension and learning, ultimately enhancing educational practices to meet the demands of the digital era.

Table 4. Key Labels of the Clusters.

Cluster	Size	Label	Silhouette	Top 10 Terms
#0	26	Linguistic landscape	0.92	speech; perception; communication; language; infants; multimodal interaction analysis; collective historical body; rhythmic training; text analysis; text-based art
#1	26	Multimodal analysis	0.941	conversation analysis; autism spectrum disorder; pointing gestures; joint attention; social semiotics; multimodal analysis; interactive banner ads; cultural diversity; literary analysis; severe speech
#2	24	organization	0.884	conversation analysis; classroom discourse; third position repair; teacher talk; modal conversation analysis; organization; turn taking; language; multimodal resources; body
#3	23	early intervention	0.906	adults; language; adolescents; down syndrome; autism; alternative communication; discourse analysis; adult-acquired cognitive-communicative disorders; rich communicative environments; functional systems
#4	23	Social semiotics	0.902	language; text; communication; visualization; media; social semiotics; multilingual children; social media; immigrant families; subtitle speed
#5	22	translation	0.868	digital literacy; new literacies; mobile learning; instructional planning; modes; identity; school; modes; literacy practices; texts
#6	22	perception	0.951	perception; head movements; beat gestures; accent; focus; speech; touch; memory; input; cross modal equivalence
#7	21	Sign language	0.937	conversation analysis; oral assessment; l2 interaction; elicited imitation; discourse markers; english; language; japanese; multimodal iteration; body knowledge
#8	21	Digital multimodal composing	0.859	critical literacy; multimodal literacy; subjective agencies; gender-inclusive picture books; multimodal analysis; digital multimodal composing; writing instruction; based model; writing assessment; digital activism

Table 4. *Cont.*

Cluster	Size	Label	Silhouette	Top 10 Terms
#9	20	Cognitive linguistics	0.963	cognitive linguistics; delayed domain appearance; online dictionary use; comprehension; virtual exchange; virtual exchange; lexical alignment; structural alignment; facial expression alignment; interactive alignment
#10	19	Social media	0.9	social media; multimodal discourse analysis; synthetic personalisation; health communication; deficit model; conversation analysis; emergent reading; multimodal interaction; classroom discourse; correction sequences
#11	18	Multimodal resources	0.929	conversation analysis; multimodal interaction analysis; instructing grammar; interactive scaffolding; sport domain; multimodal resources; organization; turn taking; language; achievement
#12	13	Construction grammar	0.796	multimodal communication; clinical pragmatics; mild cognitive impairment; pragmatic markers; communication disorders; construction grammar; multimodal analysis; material resources; l2 learners; pragmatic markers

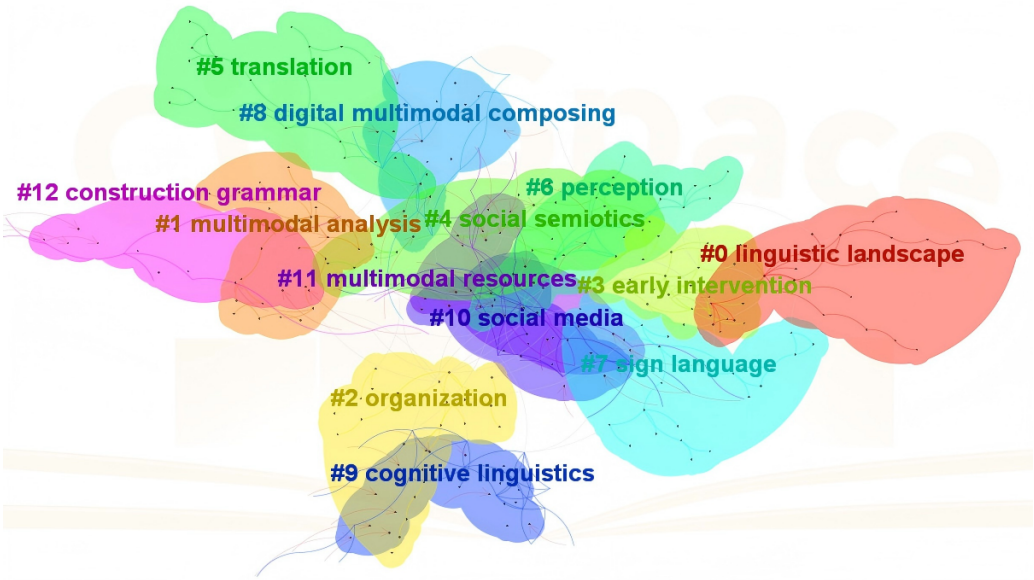

Figure 8. Keywords Clusters of Multimodal Studies.

The second crucial topic is the development and application of multimodal analysis methods. "Multimodal analysis" (Cluster #1) itself is a central focus (**Figure 8**). Scholars are dedicated to refining and innovating these methods to extract valuable insights from diverse multimodal data. The integration of interdisciplinary methods is also evident. For instance, computer vision techniques are used to automatically detect and analyze visual elements like gestures and facial expressions within multimodal resources (Cluster #2). Natural language processing tools help examine the language aspects of text data that are part of these resources, looking at things like word choice and sentence structure. Psychological theories assist in understanding the cognitive and emotional aspects of multimodal interactions. By combining these different methods, multimodal analysis can better show how different modes of communication work together, providing useful tools for studying multimodal phenomena.

Another important aspect is the application of multimodal research in specific fields. In the education field, keywords like "classroom", "students", and "education" highlight the extensive exploration of multimodal applications. Research here delves into how multimodal teaching methods enhance learning outcomes. For example, studies might examine how the use of gestures and multimedia materials in the classroom affects students' understanding and retention of knowledge. Vandommele et al. demonstrated that multimodal composition can enhance writing skills in beginner L2 learners of Dutch, highlighting the effectiveness of integrated approaches to language learning[24]. Ramos Pinto proposed a multimodal analysis framework for studying the translation of linguistic varieties in subtitled audiovisual products, emphasizing the importance of considering multimodal cues

in translation studies. In the clinical and rehabilitation domain, "early intervention" (Cluster #3) and related terms indicate the significance of using multimodal approaches for special populations [25]. This could involve using a combination of language, music, and tactile stimuli to aid in the language development of children with autism or cognitive impairments.

Multimodal research also focuses on its relationship with social factors such as identity and culture. The keyword "identity" (Cluster #8) shows that researchers are interested in how individuals and groups construct and express their identities through multimodal means. This includes analyzing how cultural diversity influences the multimodal identity expression of immigrants in different social settings. In the context of cultural communication, the study of "linguistic landscape" (Cluster #0) and related terms explores how multimodal elements in urban spaces or cultural artifacts contribute to cultural representation and communication. For example, the use of multilingual signs and visual symbols in a cityscape can convey cultural values and promote intercultural understanding.

Finally, the intersection of multimodal linguistics with emerging technologies and social phenomena is a growing area of interest. With the rise of digital technology, the study of "social media" (Cluster #10) and "digital multimodal composing" (Cluster #8) has gained momentum. This involves analyzing the multimodal features of social media content and understanding how digital platforms enable new forms of multimodal expression and interaction. Additionally, research on "digital activism" (Cluster #8) explores how multimodal strategies are employed in social movements to mobilize public support and effect social change. In the context of emerging technologies like virtual and augmented reality, although not directly represented by specific keywords in the current analysis, future research is likely to focus on the unique multimodal experiences and communication patterns in these immersive environments.

These integrated hotspots reflect a dynamic and interdisciplinary field of multimodal research, which encompasses educational applications, social interaction, cognitive processes and technological advances. The diversification of research, covering topics from sign language to virtual communication, reflects the dynamic nature of communication in today's world. Recognizing the importance of multiple modes of communication to all aspects of human interaction and learning is a recurring theme in all of these hotspots.

3.4. Emerging Trends

Based on the previous keyword clustering analysis, drawing a timeline chart can show the development and changes of keywords in each cluster, as shown in **Figure 9**. Among them, the location of the node is the year when the keyword first appeared. We found that over time, the distribution of research keywords became increasingly dispersed. Based on **Figure 1**, it can be inferred that the number of published papers is on the rise. Therefore, it can be inferred that the topics of research on online discourse are becoming increasingly diverse, and the scope of research coverage is gradually expanding. Although the number of early important keywords such as "speech", "conversation analysis", and "communication" has shown a downward trend, the number of connections between different keywords indicates a close co-occurrence relationship between these early key keywords and later keywords. The clusters of "linguistic landscape" (#0), "multimodal analysis" (#1), "orgnization" (#2), "translation" (#5), "perception" (#6), "cognitive linguistics" (#9), "social media" (#10), "multimodal resources" (#11) and "construction grammar" (#12) have good continuity and a long time span, and have received continuous attention almost in the past 20 years. The clusters of "sign language" (#7) and "digital multimodal composing" (#8) appeared relatively late around 2014, and the former is still a research hotspot today, while the latter one faded.

To further understand the evolution and development of keywords, we conducted burst detection on the research data. Citation bursts mean that the frequency of a certain keyword being cited in a certain period of time suddenly increases. The analysis of the citation bursts can predict the future research trend and grasp the research hotspot and frontier of this topic. **Figure 10** lists the top thirty keywords with bursts, which display the research hot issues and trends in multimodal research. The red line in the figure represents the time period when the keyword occurs. As revealed, "talk" (2013–2017) and "conversation analysis" (2013–2015) were early hot topics, focusing on the structure and dynamics of social interaction through language. There was also significant interest in "multimodal metaphor" (2013–2014), indicating a growing recognition of the role of non-verbal cues in

communicative acts. The emergence of digital technologies prompted research into "digital literacy" (2013–2019), reflecting the need to understand how individuals navigate and communicate within digital environments. The duration of popularity for "coordination" (2016–2018), "co-speech gesture" (2018–2019), and "play" (2019–2020) was relatively short (1–2 years), while the duration of popularity for "digital literacy" (2013–2019) is the longest (6 years). The year 2018 is the "outbreak period" of key words, which has produced five hot topics, including "grammar" (2018–2021), "multimodal resources" (2018–2019), "online" (2018–2021), "perception" (2018–2019) and "co-speech gesture" (2018–2019). In general, we can classify the development of multimodal research into four stages according to research disciplines. The first stage, from 2013 to 2014, saw a focus on the structure and dynamics of "talk" (2013–2017) and "conversation analysis" (2013–2015), with an emphasis on understanding the organization of social interaction through language. Moreover, there was a significant interest in how "multimodal metaphor" (2013–2014) functions across different modalities, indicating a growing recognition of the role of non-verbal cues in communicative acts. Besides, the emergence of digital technologies prompted research into "digital literacy" (2013–2019), reflecting the need to understand how individuals navigate and communicate within digital environments. The second stage is 2015–2016, which has seen an expansion into "sign language" (2015–2019) and "social interaction" (2016–2017). Recognition of the complexity of communicative behaviors that combine verbal and nonverbal elements has led to a shift toward a more comprehensive study of social interaction. Research focused on how "coordination" (2016–2018) in social settings is achieved through multimodal behaviors and on the interaction of different communicative cues. The third phase, from 2017 to 2019, represents a diversification of multimodal research. There is a growing interest in the diversity of "multimodal resources" (2018–2019) and the development of "multiliteracy" (2019–2020) skills. Research also began to explore the semiotic aspects of "media" (2019–2020), indicating a growing interest in how different forms of media construct meaning. Finally, the role of "gender" (2020–2021) in communicative behavior and the importance of "co-speech gesture" (2018–2019) in multimodal interactions are priority themes, reflecting in-depth research on the social and cultural aspects of communication. Phase 4 runs from 2020 to 2023, during which time more advanced research and more specialized themes emerge. The focus shifts to strategic aspects of "foreign language" (2021–2023) learning and language-specific research, as well as directions towards more applied and specialized areas in multimodality. Furthermore, the study of "translation" (2021–2023) within the context of multimodality and the exploration of "humor" (2021–2023) reflect a maturation of the field, with researchers addressing sociocultural dimensions of communication.

Figure 9. A Timeline View of Keywords Clusters in Multimodal Studies.

Throughout these periods, the field of multimodality has evolved from an initial focus on basic conversational structures to a broader examination of social interactions and the integration of digital technologies. The research has become increasingly diverse, encompassing a wide range of topics from "sign language" to "foreign language", reflecting the dynamic nature of communication in the modern world.

Top 30 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2013 - 2023
talk	2013	5.5	**2013**	2017	
conversation analysis	2013	4.36	**2013**	2015	
multimodal metaphor	2013	4.3	**2013**	2014	
digital literacy	2013	3.95	**2013**	2019	
achievement	2013	2.81	**2013**	2019	
conversation	2014	5.38	**2014**	2018	
information	2014	3.43	**2014**	2017	
multimodal interaction	2014	3	**2014**	2016	
sign language	2015	6.55	**2015**	2019	
2nd language	2015	3.52	**2015**	2019	
brain	2015	2.88	**2015**	2018	
evolution	2015	2.77	**2015**	2017	
behavior	2016	4.22	**2016**	2018	
social interaction	2016	4.22	**2016**	2017	
coordination	2016	3.53	**2016**	2018	
texts	2016	2.73	**2016**	2019	
digital literacies	2017	3.82	**2017**	2018	
grammar	2018	3.31	**2018**	2021	
multimodal resources	2013	3.08	**2018**	2019	
online	2018	2.76	**2018**	2021	
perception	2013	2.63	**2018**	2019	
co-speech gesture	2018	2.62	**2018**	2019	
multiliteracy	2019	4.17	**2019**	2020	
social semiotics	2013	3.97	**2019**	2020	
media	2019	3.91	**2019**	2020	
play	2019	2.99	**2019**	2020	
gender	2015	3.6	**2020**	2021	
translation	2018	3.47	**2021**	2023	
foreign language	2016	3.04	**2021**	2023	
humor	2021	2.53	**2021**	2023	

Figure 10. Top 30 Keywords with the Strongest Citation Bursts.

4. Conclusions and Implications

The application of multimodal theory in the field of linguistics is a rapidly developing research direction, and its future trends show characteristics of diversification and interdisciplinarity. The following are some of the main future research trends:

Interdisciplinary integration: The need to keep removing the disciplinary boundaries in future multimodal research is underpinned by the recognition that multimodal communication is a multifaceted phenomenon that goes beyond the scope of just one field. Linguistics alone cannot comprehensively explain the details of how multiple modes interact and co-construct meaning. By combining insights from cognitive science, we can gain a deeper understanding of how the human mind processes and interprets multimodal stimuli. For instance, research could explore how cognitive load is distributed across different modalities and how this impacts comprehension and retention. In sociology, the focus might shift towards analyzing how multimodal communication is socially situated and how it reflects and reproduces social hierarchies and cultural norms. The integration with psychology could illuminate the affective and perceptual aspects of multimodal experiences, such as how specific combinations of visual and auditory cues elicit emotional responses. This interdisciplinary convergence will help to create a new theoretical framework that will explain the holistic nature of multimodal communication rather than just putting various concepts side by side.

Technological and methodological innovations: The connection between the development of information technology and multimodal research is becoming increasingly clear. Compiling a multimodal corpus is not an easy task. It requires careful organization and annotation to integrate rich multimodal data. Advanced technology is crucial to process the large amounts of data generated by multimodal data sources. For example, machine learning algorithms can be trained to automatically identify and classify the different modalities of a corpus to improve the efficiency of data management. The development of tools for multimodal analysis must also keep pace with technological progress. These tools can be used not only for quantitative analysis, such as frequency statistics of specific multimodal features, but also for qualitative exploration, such as the identification of semantic and pragmatic relationships between the different modalities. The use of big data and AI technologies can enable researchers to discover previously hidden patterns and regularities in multimodal communication, which could lead to a paradigm shift in our understanding of how meaning is constructed and communicated.

Research on multimodal grammar: The controversy surrounding multimodal grammar stems from the fundamental question of whether nonverbal modalities can have the same meaning as language. However, this research needs to be pursued because it has the potential to expand our understanding of the structural foundations of communication. Future research could take a comparative approach and examine the similarities and differences in the grammatical structures of different modalities. For example, one could examine whether the combination of visual elements in an image or the arrangement of notes in a musical score follows similar syntactic and semantic rules. The construction of a multimodal grammar framework will not only deepen our theoretical understanding, but will also lead to practical applications in areas such as multimedia design and human-computer interaction.

Deepening critical discourse analysis: Multimodal critical discourse analysis will become more insightful and comprehensive. In addition to the traditional focus on language and text, the inclusion of non-verbal modalities requires a more differentiated approach. Images, for example, can be analyzed not only for their content, but also for their visual composition, color, and the cultural and ideological connotations associated with them. The role of sound in creating an atmosphere, emphasizing certain aspects of a message or reinforcing power relations can also be examined. Space itself can also be considered as a mode of communication, with the layout and design of physical or virtual spaces conveying implicit messages about social order and access. To undertake such in-depth analyses, researchers need to develop interdisciplinary analytical skills and draw inspiration from the theories of semiotics, cultural studies and spatial analysis.

Strengthening empirical research: The emphasis on empirical research in future multimodal studies reflects the need to support theoretical claims with real-world data. A large number of case studies is essential to verify the generalizability of theoretical assumptions and the validity of

analytical methods. These case studies should be diverse and cover a wide range of communication contexts, such as advertising, political discourse, educational materials and social media interactions. In order to cover all multimodal phenomena, researchers should use a combination of quantitative and qualitative research methods, such as content analysis, eye-tracking studies, and in-depth interviews. Such rigorous empirical research not only strengthens the scientific foundation of multimodal research, but also enables more evidence-based interventions and applications to be put in place.

Application to multimodal education: multimodal theory is increasingly used in educational contexts and holds great promise for educational reform. In foreign language teaching, multimodal resources can provide a more immersive and engaging learning environment. For example, through the use of videos, podcasts and interactive multimedia applications, students can simultaneously improve their listening, speaking, reading and writing skills. In multimedia teaching, the design of multimodal teaching activities can increase student motivation and interest. Future research should focus on developing evidence-based teaching strategies that optimize the use of multimodal resources. This may require experimental studies comparing the effectiveness of different multimodal teaching strategies and exploring how individual differences in learning styles and preferences interact with multimodal materials.

Internationalization of multimodal theory: With the unstoppable development of globalization, the application of multimodal theory in different cultural and linguistic environments is becoming a pressing research issue. The question of cross-cultural universality is not easy to answer. While some aspects of multimodal communication, such as basic visual and auditory perception, may be universal, cultural and linguistic differences can greatly affect the interpretation and use of multimodal symbols. For example, certain colors can have different symbolic meanings in different cultures, and the use of body language can vary greatly. In future research, cross-cultural comparative studies are needed to identify universal principles and culture-specific manifestations of multimodal communication. This will not only broaden our understanding of multimodal theory, but also promote more effective cross-cultural communication and cooperation.

In summary, the application of multimodal theory in linguistics is evolving into a more integrated, technologically sophisticated and empirically rich research paradigm. The future of this field of research will be marked by interdisciplinary collaboration, technological breakthroughs and novel theoretical and methodological developments, all of which will contribute to a deeper and more diverse understanding of multimodal communication and its vast implications.

While this study provides a comprehensive overview of the current state and trends of multimodal linguistics research through bibliometric analysis, there are several limitations that should be acknowledged. The study's reliance on bibliometric analysis means that it is limited to the data available in the Web of Science database. This may exclude grey literature, unpublished works, and other sources of information that could provide additional insights into the field. Additionally, the use of CiteSpace for visualization and analysis, while powerful, is subject to the limitations of the algorithms and parameters used. For example, the detection of citation bursts and keyword clusters is based on specific thresholds and time slices, which could influence the results.

Funding

This work was supported by the Young Innovative Talents Project for Ordinary Universities in Guangdong, China, grant number [2023WQNCX118].

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

The figures and tables used to support the findings of this study are included in the article.

Acknowledgments

This study was supported by the Young Innovative Talents Project for Ordinary Universities in Guangdong

Province in 2023: A Corpus-based Comparison of Chinese and English Dietary Verb Metaphors and Their Cognitive Motivations (Grant No.: 2023WQNCX118). I would also like to express our gratitude to Grammarly and Kimi for their invaluable support in refining the language of this manuscript. I'm very grateful to the anonymous reviewers and editors for their invaluable comments and suggestions.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] O'Toole, M., 1994. The Language of Displayed Art. Routledge: London, UK.

[2] Kress, G., Van Leeuwen, T., 1996. Reading Images: The Grammar of Visual Design. Routledge: London, UK.

[3] Van Leeuwen, T., Kress, G., 2011. Discourse Semiotics. In: Van Dijk, T.A. (ed.). Discourse Studies: A Multidisciplinary Introduction, 2nd ed. SAGE Publications Ltd.: London, UK. pp. 107–125. DOI: https://doi.org/10.4135/9781446289068.n6

[4] Barthes, R., 1967. Elements of Semiology. Cape: London, UK.

[5] Baldry, A., Thibault, P., 2006. Multimodal transcription and text analysis: A multimodal toolkit and coursebook. University of Toronto Press: Toronto, ON, Canada.

[6] O'Halloran, K.L., 2011. Multimodal discourse analysis. In: Hyland, K., Wong, L., Paltridge, B. (eds.). The Bloomsbury Handbook of Discourse Analysis. Bloomsbury Publishing: London, UK. pp. 120–137.

[7] Jewitt, C., Bezemer, J., O'Halloran, K., 2016. Introducing Multimodality. Routledge: London, UK.

[8] Nash, B., 2018. Exploring multimodal writing in secondary English classrooms: a literature review. English Journal. 17(4), 342-356. DOI: https://doi.org/10.1108/ETPC-01-2018-0012

[9] Lim, E.L., Toh, K.A., Nguyen, L., 2022. Multimodal pedagogies in English language teaching: A systematic thematic analysis of the literature. RELC Journal. 51(2), 193–208. DOI: https://doi.org/10.1016/j.linged.2022.101048

[10] Chen, C., 2006. CiteSpace: A practical guide for mapping scientific literature. Nova Science Publishers: Hauppauge, NY, USA.

[11] Chen, C., Ibekwe-SanJuan, F., Hou, J., 2010. The structure and dynamics of co-citation clusters: A multiple-perspective co-citation analysis. Journal of the American Society for Information Science and Technology. 61(7), 1386–1409. DOI: https://doi.org/10.1002/asi.21309

[12] Chen, C., 2004. CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. Journal of the American Society for Information Science and Technology. 57(3), 359–377. DOI: https://doi.org/10.1002/asi.20317

[13] Chen, C., 2017. Science mapping: A systematic review of the literature. Journal of Data and Information Science. 2(2), 1–40. DOI: https://doi.org/10.1515/jdis-2017-0006

[14] Wang, X., Qin, Y., Xu, Z., et al., 2019. A comprehensive bibliometric analysis of uncertain group decision making from 1980 to 2019. Information Sciences. 547(3), 328–353. DOI: https://doi.org/10.1016/j.ins.2020.08.036

[15] Tai, K.W.H., 2023. Shaping student responses into academic expressions: Analysing an English medium instruction history classroom from a translanguaging perspective. International Journal of Bilingual Education and Bilingualism. 27(4), 550–580. DOI: https://doi.org/10.1080/13670050.2023.2232089

[16] Li, J., Chen, C., 2017. CiteSpace: Text Mining and Visualization in Scientific Literature. Capital University of Economics and Business Press: Beijing, China.

[17] Kang, J.P., Jiang, Z.H., 2020. International multimodal research hotspots and trends (1999–2018): A visual analysis based on bibliometrix [in Chinese]. Foreign Language Education [in Chinese]. 41(3), 29–35.

[18] Duan, C.Y., Cai, J.D., 2016. Knowledge map research in the field of international ubiquitous learning [in Chinese]. Modern Distance Education Research. 1, 85–95.

[19] Kahn, D., 1997. The codebreakers: The comprehensive history of secret communication from ancient times to the internet. Foreign Affairs. 76(3), 129. DOI: https://doi.org/10.2307/20048054

[20] Newman, M.E.J., 2006. Modularity and community structure in networks. Applied Mathematics. 103(23), 8577–8582. DOI: https://doi.org/10.1073/pnas.0601602103

[21] Shibata, N., Kajikawa, Y., Takeda, Y., et al., 2008. Detecting emerging research fronts based on topological measures in citation networks of scientific publications. Technovation. 28(11), 758–775. DOI: https://doi.org/10.1016/j.technovation.2008.03.009

[22] Zhao, S., Flewitt, R., 2019. Young Chinese immigrant children's language and literacy practices on social media: a translanguaging perspective. Language and Education. 34(3), 267–285. DOI: https://doi.org/10.1080/09500782.2019.1656738

[23] Tai, T.Y., Chen, H.H.J., Todd, G., 2020. The impact of a virtual reality app on adolescent EFL learners' vocabulary learning. Computer Assisted Language Learning. 35(6), 892–917. DOI: https://doi.org/10.1080/09588221.2020.1752735

[24] Vandommele, G., Van den Branden, K., Van Gorp, K., et al., 2017. In-school and out-of-school multimodal writing as an L2 writing resource for beginner learners of Dutch. Journal of Second Language Writing. 36, 23–36. DOI: https://doi.org/10.1016/j.jslw.2017.05.010

[25] Ramos Pinto, S., 2017. Film, dialects and subtitles: An analytical framework for the study of non-standard varieties in subtitling. The Translator. 24(1), 17–34. DOI: https://doi.org/10.1080/13556509.2016.1271735