PIONEER
ACADEMIC PUBLISHING LIMITED

Visualization Analysis of Foreign Negotiated Interaction Research Based on CiteSpace

Qianqian Zhang[1]

[1] Ocean University of China, Qingdao, China
Correspondence: Qianqian Zhang, Ocean University of China, Qingdao, China.

Abstract

This paper conducts a visual analysis of negotiation-related research in foreign English-language core journals from 2013 to 2022, totaling 83 articles, using the Web of Science core collection as the database and the bibliometric tool CiteSpace 6.1.R6 software. The aim is to illustrate the annual publication volume, main countries (regions) and institutions involved, high-impact literature, and research hotspots. The results of the visual analysis show that the publication volume of foreign negotiation research is generally increasing. The United States and Spain are the main countries conducting negotiation research. The research hotspots in foreign negotiation mainly focus on the influence of various factors (learner proficiency, task, age, interaction modes, etc.) on the nature, strategies, and patterns of negotiation, with particular attention to the semantics and forms of negotiation, interaction and second language acquisition, and feedback during the negotiation process. The findings contribute to understanding the knowledge structure and development trajectory of negotiation research in foreign contexts.

Keywords: visual analysis, negotiation of meaning, negotiation of form, negotiation of content, negotiation

1. Introduction

Gass (1997) & Zhao (2015) noted that conversation provides learners with opportunities for learning and can stimulate acquisition. Meaningful interaction significantly increases input of information, thereby promoting profound development of second language acquisition (Kumar, 2003/2013: 76; Zhao, 2015). Numerous empirical studies by domestic and international scholars have focused primarily on factors influencing negotiation, such as learner age, learner proficiency in the second language, negotiation participants (student vs. student, student vs.

teacher, interviewer vs. candidate), types of tasks (bilateral tasks vs. unilateral tasks, open-ended tasks vs. closed-ended tasks, tasks with information gaps, tasks with opinion differences), and modalities of negotiation occurrence (face-to-face vs. computer-mediated, video conferencing vs. instant messaging), among others.

In recent years, there has been increasing attention on negotiation both domestically and internationally. However, there is limited systematic descriptive statistics of foreign negotiation research from an information measurement perspective domestically.

Therefore, this paper utilizes bibliometric software, CiteSpace, to obtain English literature on negotiation research, comprehensively and intuitively examining the annual publication volume, main countries (regions) and institutions involved, high-impact literature, and research hotspots of foreign negotiation from multiple research perspectives and methods.

2. Research Objects and Methodology

2.1 Research Objects

This study collected literature through subject term retrieval. The data were sourced from the Web of Science core literature database published by the American Institute of Scientific Information. To obtain more accurate subject terms, this research first clarified the concept of negotiation.

In the field of second language acquisition, from an interactive perspective, negotiation refers to the joint efforts of conversation participants to understand each other's meanings, generate more accurate language expressions, or fill in information gaps. Therefore, negotiation interaction actually includes negotiation of meaning, negotiation of form, and negotiation of content (Xu, 2020). Specifically, negotiation of meaning refers to conversation participants overcoming understanding barriers in communication, adjusting and modifying discourse to achieve a common understanding, and this process is tangential to the conversation and does not produce new information (Varonis & Gass, 1985; Xu, 2020). Negotiation of form is not due to understanding barriers, but conversation participants aim for language accuracy, striving to produce correct forms and appropriate discourse (Lowen & Sato, 2018). Participants in this process issue requests for help, corrections, or trigger "self-corrections" for themselves and the interlocutor's language issues, without generating new information, and it is also tangential to the conversation (Xu, 2020). However, negotiation of content involves conversation participants attempting to resolve content issues caused by information or viewpoint differences, which may produce new information in terms of content, driving the

discourse forward, and it is the mainstream of the conversation (Rulon & McCreary, 1986; Xu, 2020). Therefore, this paper used the subject terms "negotiation" or "negotiation of meaning" or "negotiation of form" or "negotiation of content", with a time range from 2013 to 2022. After manually filtering out noise from the initial search results, a total of 83 records were obtained.

2.2 Research Tool

The research tool utilized CiteSpace for visual analysis. CiteSpace, which can be translated as "Citation Space," is a visualization analysis software developed within the context of information visualization. It is used to analyze potential knowledge contained within scientific literature, including co-citation networks, co-occurrence of keywords, and other related citation networks.

2.3 Research Methodology and Procedures

Firstly, clarify the research theme, data source, and retrieval method. The research theme is "negotiation" or "negotiation of meaning" or "negotiation of form" or "negotiation of content"; the data are sourced from the Web of Science core literature database. Secondly, conduct data collection. Access the Web of Science database and use the subject terms "negotiation" or "negotiation of meaning" or "negotiation of form" or "negotiation of content", with a time range from "2013 to 2022", document type set as "article", language set as "English", and categories set as "Education Educational Research", "Linguistics", "Language Linguistics". Thirdly, manually filter out noise and conduct preliminary analysis of the retrieved literature. Fourthly, export the de-noised literature in "plain text format" with the content recorded as "full records and cited references", then use CiteSpace software to convert the format of the downloaded raw files. Fifthly, conduct visual analysis of institutions, countries, keywords, etc., using CiteSpace software. Sixthly, conduct in-depth analysis and interpretation of the visual analysis data.

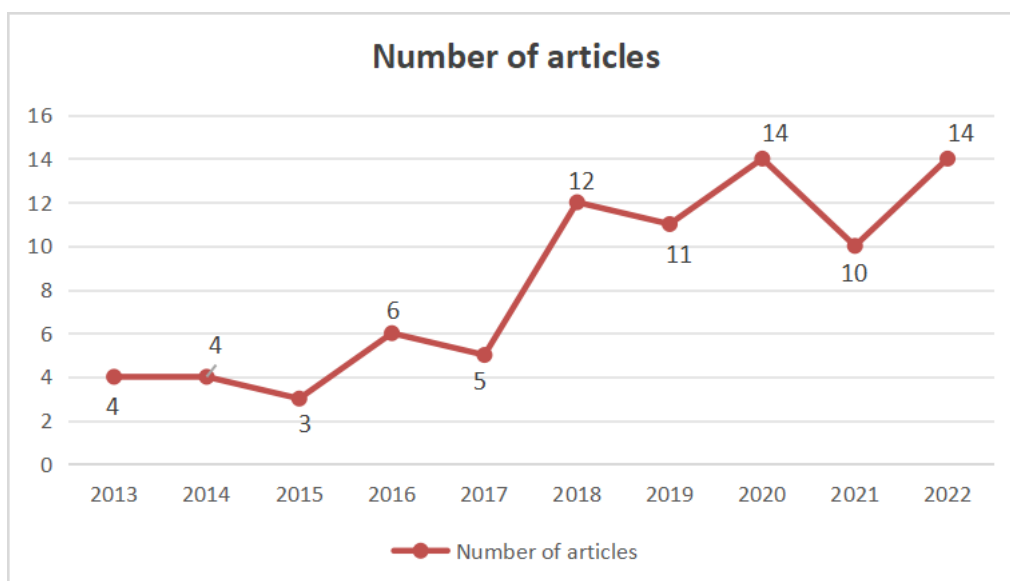## 3. Data Processing and Results Analysis

Figure 1. Line Chart of Annual Publication Volume of Foreign Negotiation Research from 2013 to 2022

From Figure 1, it can be observed that the annual publication volume of foreign negotiation research shows a significant overall increasing trend from 2013 to 2022, rising from 4 articles to 14 articles. The analysis can be divided into three time periods: from 2013 to 2017, there were relatively few publications in this field, indicating that negotiation research did not receive much attention during this period. However, there was a sharp increase in publications in 2018, and although there were slight declines in 2019 and 2021, the overall trend from 2018 to 2022 remained upward. This indicates that negotiation research has attracted significant attention from the foreign linguistics community in recent years and has been valued by foreign scholars.

3.1 Analysis of Main Countries (Regions) and Institutions

In this study, Time Slicing is set from 2013 to 2022, with a time slice of "1". The Term Source function is kept at its default settings, with "Title", "Abstract", "Author Keywords", and "Keywords Plus" selected. "Country" is chosen as the function and parameter in the Node Type setting, with the Selection Criteria function set to Top50 to extract the top 50 countries by frequency within each time slice. The network connection strength calculation uses the Cosine algorithm. The data analysis results are pruned using the "Pathfinder" method, and by adjusting the threshold, the final visualized results of the data are obtained. Specific information is shown in Figure 2.
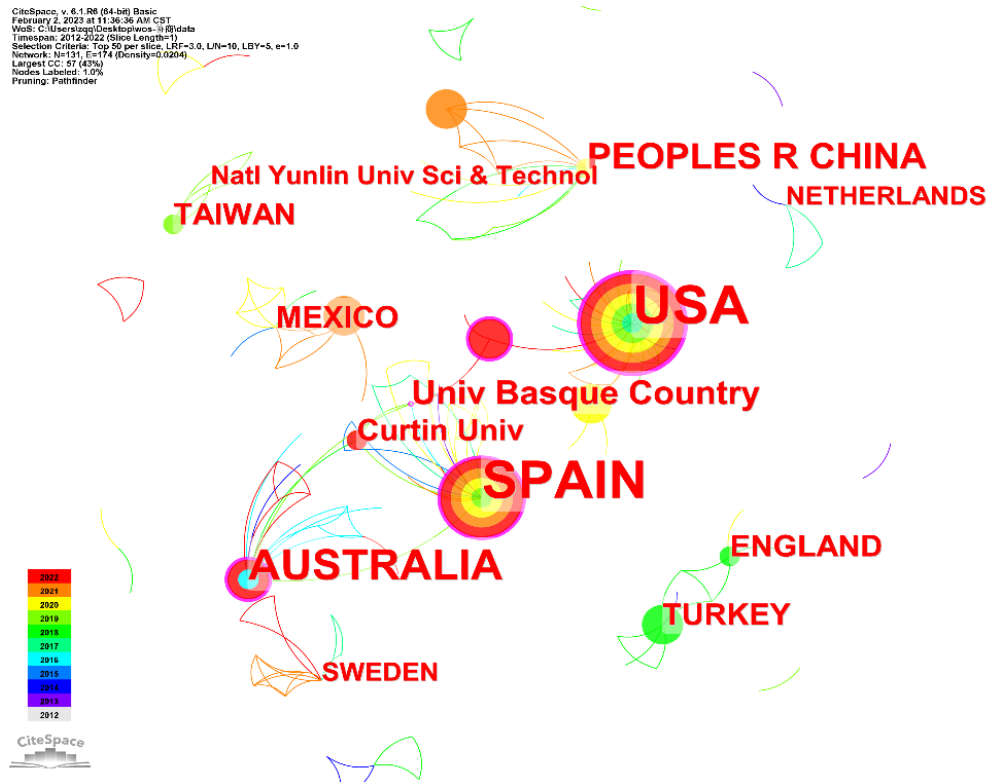
Figure 2. Map of Main Countries and Universities Involved in Foreign Negotiation Research

From Figure 2, it can be observed that the main nodes are surrounded by a purple halo, indicating that these countries and institutions have a high volume of publications in the field of negotiation research and that the number of studies is increasing rapidly. Among them, the node representing the United States is the largest, indicating that this country has the highest number of negotiation research publications. In Figure 2, nodes representing Spain and Australia also have purple halos, indicating that these nodes have high centrality. Centrality, as measured from the network structure, is an indicator of the importance of nodes in the knowledge map presented by CiteSpace (Ren, 2020), suggesting that they also hold significant positions in foreign negotiation research (Chen, 2012; Sun, 2020). The publication situation of each country and institution is shown in Table 1.

Table 1 represents the top five countries in terms of the number of publications on negotiation research from 2013 to 2022. The United States ranks first in the number of publications, followed closely by Spain, while Australia also contributes significantly, indicating that they are the main countries for negotiation research. Among the research institutions, the University of the Basque Country leads with 6 publications, holding the top position in terms of the number of publications.

Table 1. Statistics of Publications on Foreign Negotiation Research by Country and Institution

Country/Region	Number of Publications	Percentage (%)	University	Number of Publications
United States	18	21.7	University of the Basque Country	6
Spain	17	20.5	Public University of Navarra	5
Australia	9	10.8	Curtin University	4
China	6	10.2	National Yunlin University of	3

			Science and Technology
United Kingdom	4	4.8	
Mexico	4	4.8	
Taiwan	4	4.8	
Turkey	4	4.8	

3.2 Research Hotspots

Keywords, as the core and essence of an article, succinctly summarize the topic of the article. High-frequency keywords are often considered as the research hotspots in the field. (Xu, 2015) Figure 3 displays the scientific co-occurrence network of keywords. The size of the nodes in the graph represents the frequency of keyword citations, with larger nodes indicating higher citation frequency. The color depth within each node represents citations from different years. (Ying, 2019)
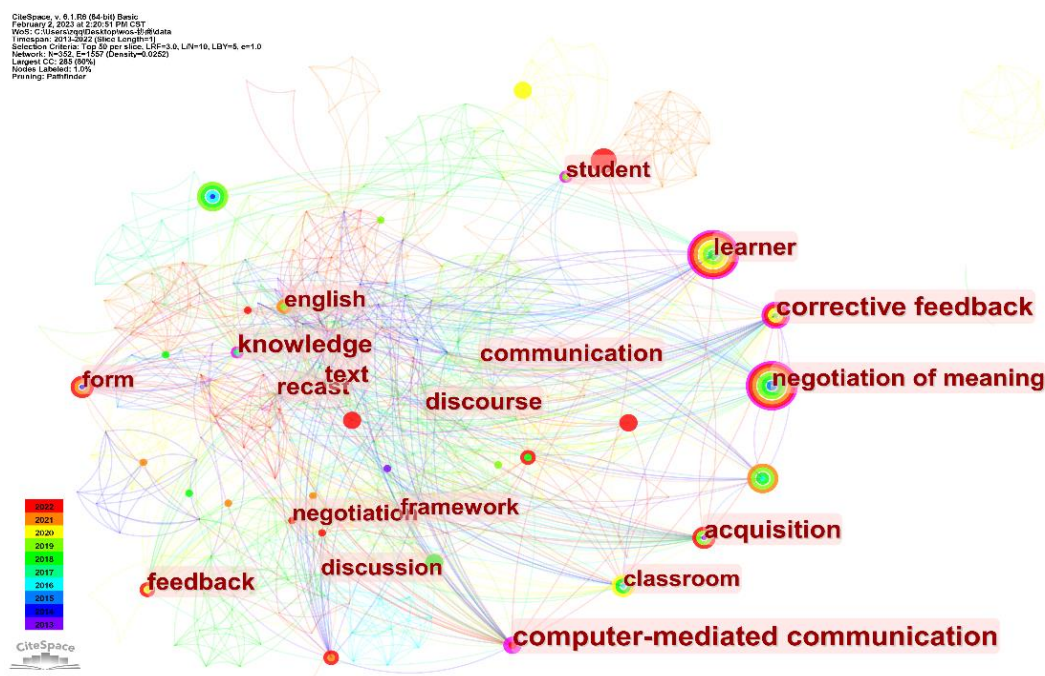

Figure 3. Co-occurrence Network of Keywords in Negotiation Research

Table 2. High-Frequency Keywords in Negotiation Research (2013-2022)

No.	Keywords	Frequency
1	negotiation of meaning	24
2	learner	17
3	language	14
4	corrective feedback	12
4	acquisition	12
5	classroom	11
6	conversation	9

No.	Keywords	Frequency
6	feedback	9
7	computer-mediated communication	8
7	English	8
8	input	7
8	form	7

Based on Table 2 and Figure 3, "negotiation of meaning" emerges as the most frequently occurring keyword in the knowledge graph, with a frequency of 24. The top eight keywords are ranked as follows: "learner" (17), "language" (14), "corrective feedback" (12), "acquisition" (12), "classroom" (11), "conversation" (9), "feedback" (9), "computer-mediated communication" (8), "English" (8), "input" (7), and "form" (7). It is evident that over the past decade, foreign negotiation research primarily focuses on English as a second language, predominantly in classroom settings. The research direction largely revolves around negotiation of meaning and form, with a notable emphasis on computer-mediated communication and feedback in negotiation processes. Moreover, it highlights the provision of comprehensible input during negotiation processes, which facilitates second language acquisition. Further exploration of the relationships between these keywords in the co-occurrence knowledge graph will provide deeper insights into their interconnections.
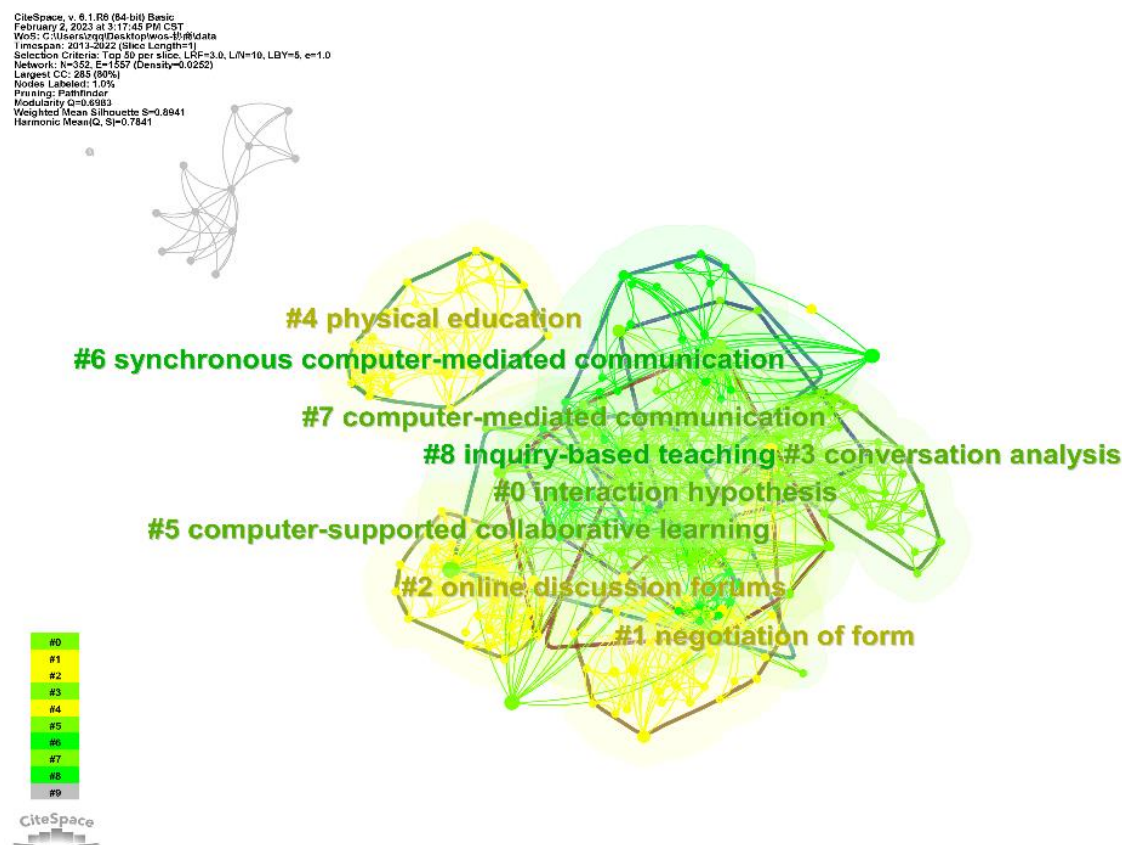

Figure 4. Clustered Knowledge Graph of Keywords in Foreign Negotiation Research (2013-2022)

Figure 4 illustrates the clustered knowledge graph of foreign negotiation research from 2013 to 2022. It is divided into nine clusters, each representing a specific thematic area, with

CiteSpace extracting frequently occurring phrases as cluster names (Zhang et al., 2019). The themes of foreign negotiation research include the interaction hypothesis (#0), negotiation of form (#1), online discussion forums (#2), conversation analysis (#3), physical education (#4), computer-supported collaborative learning (#5), synchronous computer-mediated communication (#6), computer-mediated communication (#7), and inquiry-based teaching (#8). This clustered graph provides a more intuitive and visual representation of the relationships between keywords, reflecting the research hotspots in foreign negotiation studies in recent years.

In addition to focusing on keyword frequency, capturing research hotspots also involves considering citation bursts. Citation burst refers to a sudden and significant increase in the frequency of citations of a keyword within a specific time period, which to some extent indicates the current research focus (Ying & Ning, 2019; Sun, 2020). By using CiteSpace 6.1.R6 software to detect "burst keywords" (see Figure 5), it was found that the keyword "classroom" had the highest burst intensity over the past decade, while the keyword "CLIL" had the highest burst intensity in the past two years. The burst periods for these keywords were 2016-2018 and 2020-2022, respectively.

Taking "CLIL" as an example, it refers to an educational approach where students learn a subject in a second language, typically English (Eurydice European Unit, 2006; Lasagabaster & Sierra, 2010). This integration of content and language learning occurs simultaneously (Coyle, 2007), and it has become a forefront topic in negotiation research. More scholars are focusing on negotiation interactions in classrooms and the impact of teaching contexts on negotiation.

In the following sections, we will further interpret two highly cited articles corresponding to the burst keywords "classroom" and "CLIL," namely Rouhshad (2016) and Angeles Hidalgo (2021), respectively.

Negotiation studies predominantly take place in classrooms, involving learners of various language proficiencies, modalities, and task types. Rouhshad et al. (2016) investigated the nature of negotiation among 24 intermediate-level English learners in two different modalities (face-to-face vs. synchronous computer-mediated communication) during two similar decision-making tasks, examining which modality facilitated language learning more effectively. Additionally, this study examined the impact of interaction modality on negotiation types and outcomes (e.g., negotiated output modifications and successful uptake). The findings revealed that both modalities exhibited limited negotiation of meaning and form, but negotiation of meaning was more prevalent in face-to-face conditions.

On the other hand, research related to Content and Language Integrated Learning (CLIL) primarily compares negotiation among learners of different proficiency levels, ages, and tasks under the same CLIL context or among learners in different teaching contexts (Azkarai & Imaz Agirre, 2016). For instance, Angeles Hidalgo M (2021) investigated the oral interactions of 80 Spanish EFL students across two age groups (8-9 years and 10-11 years) during a collaborative puzzle completion task, particularly focusing on the nature of negotiation of meaning and the strategies employed by younger learners. The results revealed significant differences between the two age groups: younger children primarily engaged in negotiation to repair communication breakdowns, whereas older children were more concerned about the interlocutor's needs. Similar to previous studies involving this population, strategies focusing on form were seldom observed.
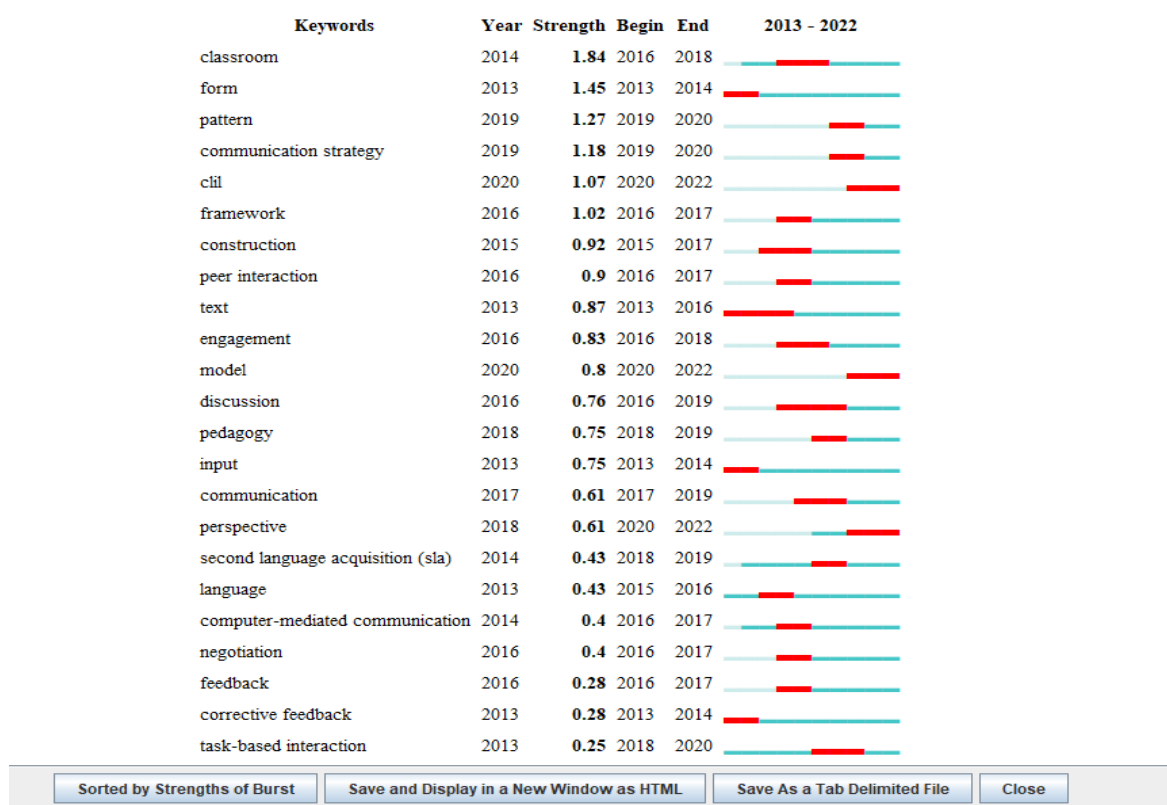
Top 23 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2013 – 2022
classroom	2014	1.84	2016	2018	
form	2013	1.45	2013	2014	
pattern	2019	1.27	2019	2020	
communication strategy	2019	1.18	2019	2020	
clil	2020	1.07	2020	2022	
framework	2016	1.02	2016	2017	
construction	2015	0.92	2015	2017	
peer interaction	2016	0.9	2016	2017	
text	2013	0.87	2013	2016	
engagement	2016	0.83	2016	2018	
model	2020	0.8	2020	2022	
discussion	2016	0.76	2016	2019	
pedagogy	2018	0.75	2018	2019	
input	2013	0.75	2013	2014	
communication	2017	0.61	2017	2019	
perspective	2018	0.61	2020	2022	
second language acquisition (sla)	2014	0.43	2018	2019	
language	2013	0.43	2015	2016	
computer-mediated communication	2014	0.4	2016	2017	
negotiation	2016	0.4	2016	2017	
feedback	2016	0.28	2016	2017	
corrective feedback	2013	0.28	2013	2014	
task-based interaction	2013	0.25	2018	2020	

| Sorted by Strengths of Burst | Save and Display in a New Window as HTML | Save As a Tab Delimited File | Close |

Figure 5. Evolution of Key Terms in Foreign Negotiation Research

3.3 Highly Cited Literature

Through the research achievements of certain influential author groups, to some extent, it helps grasp the research dynamics of a certain discipline (Ma & Liu, 2018; Sun, 2020). A commonly used measurement indicator for assessing the influence of literature is the number of citations. By running CiteSpace 6.1.R6, the knowledge map of literature co-citations can be obtained, as shown in Figure 6.
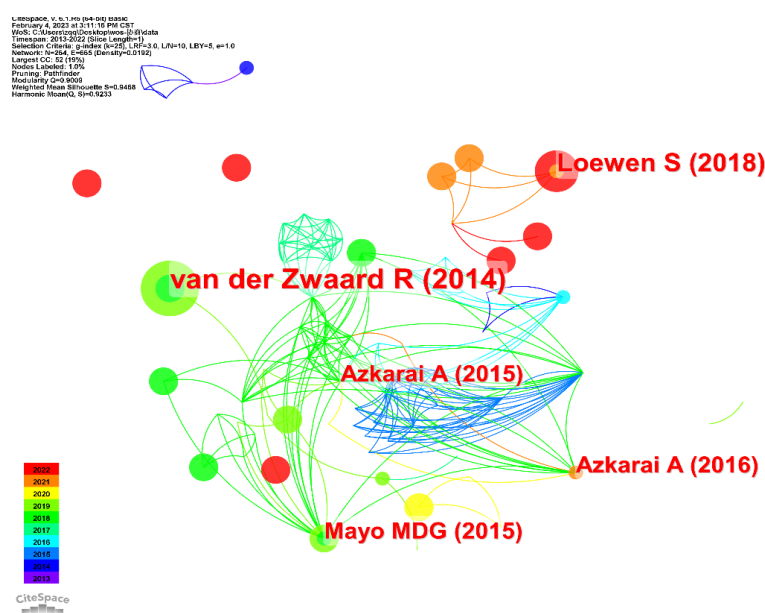

Figure 6. Knowledge Map of Co-Citation of Foreign Negotiation Literature

As shown in the figure, the knowledge map consists of colored nodes and connections between nodes. Nodes represent literature, and the connections between nodes represent co-citation relationships. The larger the node, the higher the frequency of citations for the corresponding literature. Nodes are composed of different-colored rings, with each color corresponding to a different time period. (Refer to the color bar in the bottom left corner of the graph). From inside to outside, the rings correspond to time periods from earlier (purple) to later (green, yellow, and finally red). The connections between nodes represent their co-citation relationships. The thicker the connection, the stronger the co-citation relationship, indicating a closer relationship between the literature. CiteSpace only extracts the first author of the literature as the node label for the knowledge map. (Zhang et al., 2017; Sun et al., 2020). The largest node in the graph is clearly Van der Zwaard R (2014), which has been cited 6 times over the past decade, followed by Loewen S (2018), cited 5 times. According to statistics, there are 5 papers with co-citation frequencies of 4 or more times, as detailed in Table 3.

Table 3. Highly Cited Literature on Foreign Negotiation Research

Title	Author	Year	Citations
Video call or chat? Negotiation of meaning and issues of face in telecollaboration	Rose van der Zwaard*, Anne Bannink	2014	6
Interaction and instructed second language acquisition	Loewen, Shawn; Sato, Masatoshi	2018	5
Task-modality and L1 use in EFL oral interaction	Agurtzane Azkarai, María del Pilar García Mayo	2015	4
Do children negotiate for meaning in task-based interaction? Evidence from CLIL and EFL settings	María del Pilar García Mayo a, *, Amparo Lazaro Ibarrola b, 1	2015	4
Negotiation of Meaning Strategies in Child EFL Mainstream and CLIL Settings	AGURTZANE AZKARAI AND AINARA IMAZ AGIRRE	2016	4

As shown in Table 3, from the top three most cited articles, it can be observed that foreign negotiation research primarily focuses on negotiation of meaning in various task modalities and teaching contexts, as well as on interaction and second language acquisition. Due to space constraints, the author will select one representative article from each aspect for further discussion.

"Video call or chat? Negotiation of meaning and issues of face in telecollaboration" by Rose van der Zwaard* and Anne Bannink (2014) investigates two forms of real-time one-on-one computer-mediated communication: video calls and instant messaging. The study explores the nature, scope, and potential patterns of one-on-one negotiation interactions between non-native and native speakers from two different universities in these two communication modes. The research reveals that negotiation of meaning events occur in both types of real-time interactions, but with unique patterns of negotiation interactions. Moreover, compared to instant messaging, video calls trigger more potential face issues.

Loewen, Shawn; Sato, Masatoshi (2018) review classroom and lab-based second language acquisition research conducted through interactional methods. Starting from the central structure of interaction including input, negotiation of meaning, and output, they further outline various specific areas of interactional research, consider language features related to interaction and second language learning, discuss interactional contexts, particularly focusing on computer-mediated interaction, and finally consider various methods for measuring language form attention during interaction. The

conclusion drawn is that interaction can promote second language development, but there are also many factors that affect its effectiveness.

"Task-modality and L1 use in EFL oral interaction" by Agurtzane Azkarai and María del Pilar García Mayo (2015) is one of the most influential articles in recent years. This study mainly examines the conversation strategies of 70 English learners aged 9-12 in mainstream and CLIL contexts (age and proficiency-matched dyads) when completing guessing games and picture placement tasks. The results show that younger learners engage in more negotiation of meaning, and mainstream learners use more conversation strategies compared to learners in CLIL contexts. Additionally, task-based differences in negotiation of meaning strategies seem to depend on age and teaching environment. The findings suggest that age, teaching context, and the task involved may influence the negotiation strategies used by EFL learners in task-based interaction.

4. Conclusion

Based on the analysis conducted using CiteSpace 6.1.R6 software, it is evident that foreign negotiation research has shown an overall increasing trend in publication volume. The United States and Spain emerge as leaders in negotiation research, indicating a growing interest among researchers in this field. Combined with keyword analysis, the hotspots in foreign negotiation research primarily revolve around the influence of various factors (learner proficiency, tasks, age, interaction modalities, etc.) on the nature, strategies, and patterns of negotiation. The research focuses on negotiation of meaning and form, interaction, second language acquisition, and feedback during negotiation processes.

In recent years, domestic attention to negotiation research in China has also been increasing, with research outcomes becoming increasingly diverse. However, there are several issues that need to be addressed. For instance, most domestic studies only focus on individual types of negotiation, rarely exploring the overall scenario. Moreover, the languages involved in negotiation research are mostly limited to English, with limited samples and short research durations, leading to limited generalizability of sample conclusions.

It is hoped that this study can help domestic researchers timely understand the current hotspots in negotiation research, broaden their horizons, and enhance their research capabilities. However, it is important to acknowledge the limitations of this study. The judgment of foreign negotiation research hotspots in this paper is based solely on the Web of Science core and concentrated English literature, along with the CiteSpace analysis software. Additionally, it is influenced by the researcher's own perspective and viewpoint, hence the conclusions drawn may have inaccuracies. Nevertheless, it can serve as a reference for researchers to understand the development of negotiation research abroad.

References

Azkarai, A., & Agirre, A. I. (2016). Negotiation of meaning strategies in child EFL mainstream and CLIL settings. *TESOL Quarterly*.

Coyle, D. (2007). Content and language integrated learning: Towards a connected research agenda for CLIL pedagogies. *International Journal of Bilingual Education and Bilingualism, 10*, 543–562. doi:10.2167/beb459.0.

Eurydice European Unit. (2006). *Content and language integrated learning (CLIL) at school in Europe*. Brussels, Belgium: Author.

Gass, B. (1997). *Input, Interaction, and the Second Language Learner*. Lawrence Erlbaum Associates.

Hidalgo, M. A. (2019). Differences in the task-supported negotiations of younger and older EFL children: from repair into prevention. *IRAL — International Review of Applied Linguistics in Language Teaching*.

Kumaravadivelu, K. (2013). *Beyond Methods: Macrostrategies for Language Teaching*. Peking University Press.

Lasagabaster, D., & Sierra, J. M. (2010). Immersion and CLIL in English: More differences than similarities. *ELT Journal, 64*, 367–375. doi:10.1093/elt/ccp082.

Li, H., & He, G. (2018). Visualization analysis of hot topics in second language acquisition research and its enlightenment. *Journal of Tianjin Foreign Studies University, 25*(4), 16.

Loewen, S., & Sato, M. (2018). Interaction and instructed second language acquisition. *Language Teaching, 51*(03), 285-329.

Loewen, S., & Sato, M. (2018). Interaction and

instructed second language acquisition. *Language Teaching, 51*(03), 285-329.

Ma, X., Chen, Y., Hou, J., & Zhang, Z. (2016). Visualization analysis of second language acquisition research based on CiteSpace (1970-2014). *Journal of PLA University of Foreign Languages, 39*(1), 9.

Ren, W., Gao, M., & Wang, X. (2020). Dynamic visualization comparative analysis of domestic and foreign language testing research (1998-2019). *Foreign Languages in China, 17*(4), 10.

Rouhshad, A., Wigglesworth, G., & Storch, N. (2015). The nature of negotiations in face-to-face versus computer-mediated communication in pair interactions. *Language Teaching Research*, 600.

Rulon, & McCreary. (n.d.). Negotiation of content: teacher-fronted and small-group interaction.

Sun, F., Song, Q., & Chen, Y. (2020). Dynamic visualization analysis of foreign task complexity research (1999-2019). *Chinese Journal of Applied Linguistics, 000*(001), 30-40, 121.

van der Zwaard, R., & Bannink, A. (2014). Video call or chat? Negotiation of meaning and issues of face in telecollaboration. *System, 44*, 137-148.

Varonis, M., & Gass, S. (1985). Non-native/non-native conversations: a model for negotiation of meaning. *Applied Linguistics, 6*(1), 71-90.

Xu, J., & Shu, J. (2020). Empirical study of peer negotiation interaction in university English classrooms in China. *Foreign Language Teaching and Research, 52*(6), 14.

Ying, J., & Ning, Q. (2019). Dynamic visualization analysis of international second language pragmatics research. *Journal of Zhejiang International Studies University*, (1), 9.

Zhang, J., & Du, L. (2019). Visualization analysis of domestic research on language gender discrimination based on CiteSpace. *Journal of Ningbo Institute of Technology, 31*(4), 7.

Zhao, L. (2015). Research on negotiation interaction of Chinese learners in task-based oral Chinese classrooms. *Chinese Language Teaching in the World, 29*(3), 15.