

A Bibliometric Analysis of Language Transfer Research: Trends and Hotspots

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Abstract: In recent years, the field of second language acquisition has witnessed a noticeable surge in the significance of language transfer research. This current study conducted a comprehensive bibliometric analysis of language transfer research within the time frame spanning 2012 to 2023, focusing on the primary research trends and hotspots. A dataset comprising 1259 documents, sourced from the Web of Science (WOS) was collected and subjected to meticulous analysis through the combined utilisation of the Statistical Analysis Toolkit for Informetrics 4.0 (SATI) software and VOSviewer. The findings shed light on the developmental trajectory, current status, and future trends in language transfer research, offering valuable insights for further research directions and pertinent recommendations. This study holds particular significance for practitioners in the field of language education, offering a comprehensive comprehension of the contemporary landscape of language transfer. Furthermore, its implications extend to the realm of research methodology, rendering valuable guidance for the application and utility of visualisation techniques within the sphere of language transfer exploration.

Keywords: bibliometric analysis, hotspots, language transfer, second language acquisition, trends

INTRODUCTION

Early research in language transfer can be traced back to the 1950s. It was closely related to linguistics and psychology and adopted behaviourist psychology and structural linguistics as its theoretical and methodological basis respectively during that time (Gass & Selinker, 2001; Ellis 2008). Also, the concept of mother tongue influence was first introduced into the field of second language acquisition (SLA) research. Odlin (2016) emphasised Uriel Weinreich (1953) rather than Robert Lado (1957) who first discussed the phenomenon of first language (L1) influence. Influential appellations such as “interference”, “language transfer”, “mother tongue influence”, and “cross-linguistic influence” were then introduced. Despite some controversies surrounding both the term “transfer” and the concept of crosslinguistic influence, many SLA researchers continue to use the word “transfer” or the phrase “language transfer.” According to Odlin (1989), transfer refers to the impact that arises from the resemblances and distinctions between the target language and any other language that has been previously (and maybe not entirely) acquired.

In recent decades, the study of language transfer has gained increasing importance in the field of SLA, pedagogy, or classroom contexts. It has been widely observed by scholars that a learner’s first language plays a significant role in influencing the acquisition of a second language (Selinker, 1969; Odlin, 1989; Ellis, 2008). Numerous researchers have recognised the significance of language transfer and have made noteworthy contributions to the field, exemplified by their valuable studies and findings (Válcea, 2020; Ariffin et al., 2021; Perkins & Zhang, 2022). Despite the recognition of language transfer’s importance, systematic research in this area remains scarce. Therefore, there is considerable value in gaining a comprehensive understanding of the current status, research hotspots, key points, main problems, and future directions of language transfer research in second language acquisition.

Bibliometric techniques serve as a valuable tool for gaining insights into the structure of a field, its social networks, research trends, and the hotspots of a certain field. To date, bibliometrics has employed a diverse range of metrics, encompassing the calculation of publication and citation counts, as well as the integration of publication, citation, and indexation through various algorithms (Harzing, 2019). Several systematic literature reviews utilising bibliometric techniques have already been conducted within the field of linguistics. For example, studies have focused on second language acquisition (Zhang, 2020) and bilingualism/multilingualism (Lin & Lei, 2020). However, a comprehensive bibliometric analysis examining the research landscape of language transfer appears to be scarce. Consequently, the purpose of this paper was to adopt bibliometric analysis, specifically implemented through SATI 4.0 and VOSviewer to explore the current research status of language transfer. This analysis aimed to generate knowledge maps and conduct a systematic and comprehensive evaluation of the existing literature in the field of language transfer research.

To address this need, this study utilised SATI 4.0 software and VOSviewer to process 1259 documents obtained from the Web of Science (WoS) that are specifically related to language transfer in SLA. The utilisation of this software allows for efficient data analysis and enables researchers to explore the diverse aspects of language transfer research systematically. By delving into these research documents, this study aimed to shed light on the current state of language transfer research and provide insights that can inform future directions in SLA to

contribute to the development of second language acquisition and enhance the effectiveness of English teaching and learning.

DATA AND METHODS

Several well-established bibliometric databases, including Web of Science, Scopus, and Google Scholar, have been widely utilised for conducting bibliometric studies (Chadegani et al., 2013; Fernandez-Llimos, 2018; Martín-Martín et al., 2018; Roldan-Valadez et al., 2019). To choose the appropriate database for the current study, the following processes were observed.

First, a title search using identical criteria on both WoS and Scopus was conducted. This resulted in 1259 documents on WoS and 978 on Scopus. It appears that WoS has a higher number of documents than Scopus for the specific search topic of this study. Second, the data analysis in this study was conducted using the Bibliometrix tool. According to the developers of Bibliometrix, merging datasets from these two databases is not advisable due to their different approaches to codifying bibliographic metadata. Moreover, previous studies have consistently indicated that the WoS database possesses higher quality and broader coverage of documents (Liu et al., 2015; Elaish et al., 2019; Birkle et al., 2020). Therefore, the literature data used in this present study were downloaded from the Web of Science (WoS) core collection. The Web of Science Core Collection consists of six online indexing databases: Science Citation Index Expanded (SCI or SCIE), Emerging Sources Citation Index (ESCI), Arts & Humanities Citation Index (A & HCI), and Book Citation Index. SCIE and SSCI are the most frequently-used databases in bibliometric analysis than the other databases (Yu & Liao, 2016).

The retrieval process involved employing “language transfer” as the topic browsing term with the selected time frame spanning from January 1, 2012, to June 1, 2023. “Articles” was considered as the literature type, while the research areas were precisely delineated as “linguistics” and “educational research”. Following a meticulous selection process, a total of 1259 documents met the predetermined criteria. On June 3, 2023, all documents were meticulously downloaded in plain text file format.

Science mapping is an essential procedure of bibliometrics (Powell, 2016). It can represent the discipline situation and development status (Garousi, 2016). There are many softwares for bibliometrics analysis. VOSviewer (Centre for Science and Technology Studies, Leiden University, Leiden, The Netherlands) and SATI (Statistical Analysis Toolkit for Informetrics) were used to make visualization mapping in this paper. VOSviewer is a free software developed by Eck and Waltman (Van Eck & Waltman, 2010), which has a powerful function in co-occurrence analysis and co-citation analysis (Liu & Zhang, 2021). SATI (Statistical Analysis Toolkit for Informetrics) is bibliographic information analysis software that was developed using C# based on Microsoft.NET platform. It has four functions, that is, title format conversion, field information extraction, frequency statistics of entries and knowledge matrix construction, to assist knowledge map construction and visual analysis (Liu & Ye, 2012). In this study, SATI 4.0 software and VOSviewer were utilised to process the 1259 documents related to language transfer from the core collection of Web of Science (WoS). Various data analysis methodologies, encompassing general econometric analysis, co-occurrence analysis, cluster analysis, multidimensional scale analysis, and social network analysis, were employed to scrutinize the dataset. Through the quantitative visualization techniques, the current status of the main research hotspots in language transfer in SLA is presented in the following section.

FINDINGS

The results of the analysis is presented in three sections: i) an description of the current state of language transfer study, ii) an analysis of keywords associated with research focal points in the realm of language transfer, and iii) an exploration of co-citation patterns.

The Current Status of Language Transfer Study

Within this section, the findings pertaining to the annual patterns observed in language transfer publications are described. Additionally, an account concerning the distribution of language transfer-related publications is provided, from the institutional and journal perspectives.

The annual trends of publications on language transfer

Figure 1 illustrates the yearly trends of publications of language transfer between 2012 and 2023 (the data analysed does not cover the period of June to December of 2023). It is noteworthy that there has been a remarkable surge of 3.27 times in global production, from 59 publications in 2001 to 193 publications in 2022. This substantial increase provides compelling evidence for the growing discourse and investigation of language transfer in Second Language Acquisition (SLA) research. Initially, from 2012 to 2017, the annual publication count of related articles ranged from 59 to 82. However, from 2018 to 2022, the field of language transfer research experienced a significant upswing, with an annual publication count surpassing 120. Notably, in 2022, the number escalated further, reaching an impressive 193 articles. The consistent upward trajectory observed over the past twelve years signifies the gradual garnering of attention towards language transfer within academic circles.

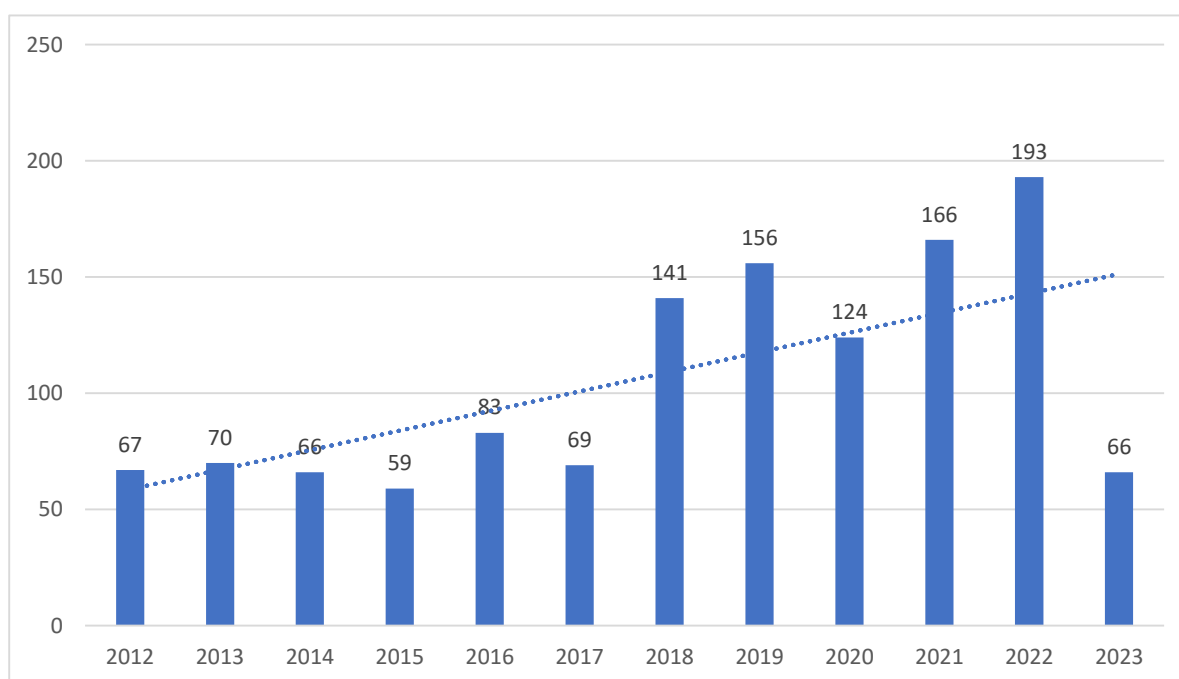


Figure 1: Annual trends of publications
(Web of Science core collection database, 2012.01–2023.06)

The Distribution of Institutes on the Study of Language Transfer

The analysis reveals that the top ten institutes that has published studies in language transfer include five American institutes, two Canadian institutes, two Chinese institutes and one Israeli institute. It also indicates that the University of Toronto has the greatest number of publications with a total of 30 papers. Chen (2012) from the Department of Applied Psychology and Human Development, Ontario Institute for Studies in Education, University of Toronto compares the cognitive processes that contribute to reading comprehension between language minority children and their peers who speak the societal language as the first language. Their findings point to the importance of considering both cognitive and sociocultural factors in literacy research involving language-minority children. At the second position is the University of Hong Kong with 20 publications followed by the Dalhousie University, Texas A&M University, University Haifa, University of Maryland, Beijing Normal University, University of Washington, University of Illinois, and University of Cambridge. These top ten institutes are listed in Figure 2.

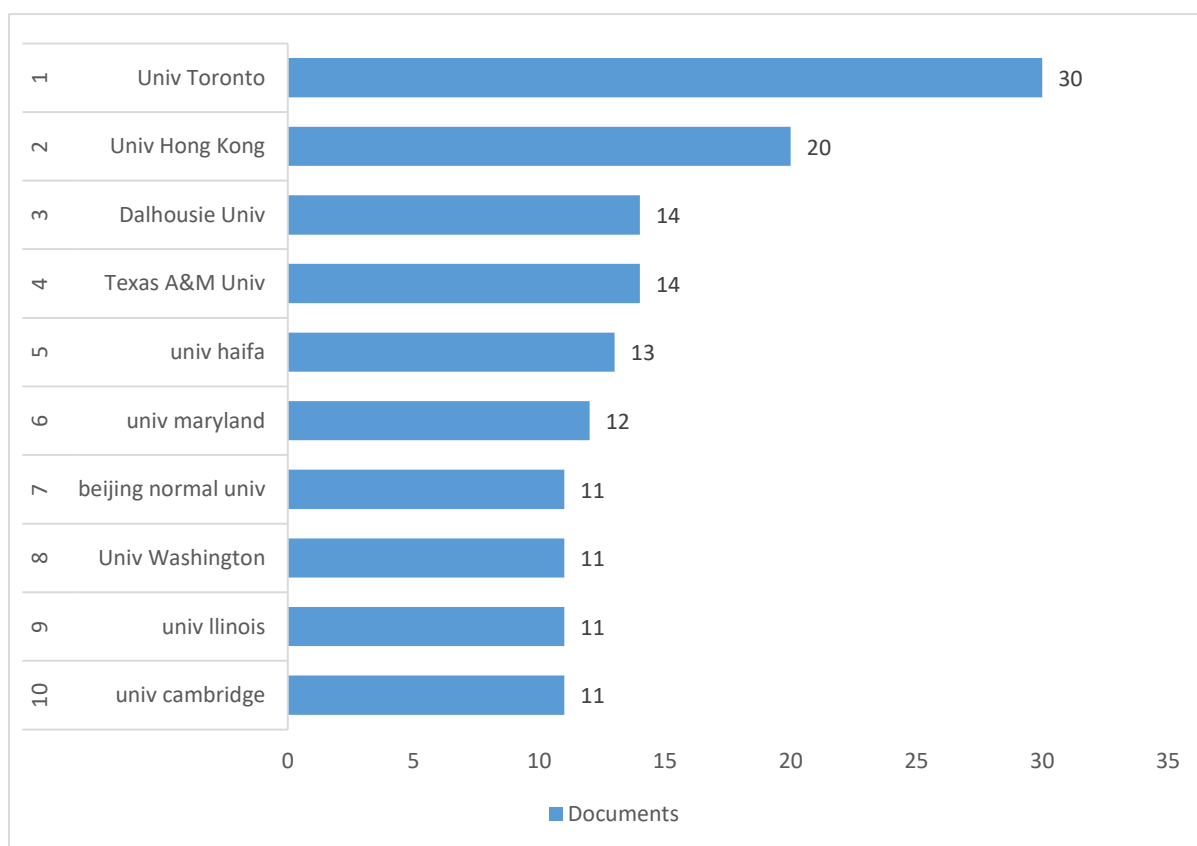


Figure 2: The top 10 institutes with publications on language transfer

The Distribution of Published Journals on Language Transfer Study

Figure 3 shows the top ten journals that published the most language transfer articles. *Second Language Research* tops the list with 48 articles. This is followed by *Reading and Writing*, with 39 articles, *IRAL-International Review of Applied Linguistics in Language Teaching* with 37 articles and *International Journal of Bilingual Education and Bilingualism* with 33 articles. The *International Journal of Multilingualism*, *Language Learning*, *Computer Assisted Language Learning*, *Modern Language Journal*, *Language Teaching Research* and *Journal*

of *English for Academic Purposes* each published 27, 24, 18, 17, 17, and 15 articles respectively.

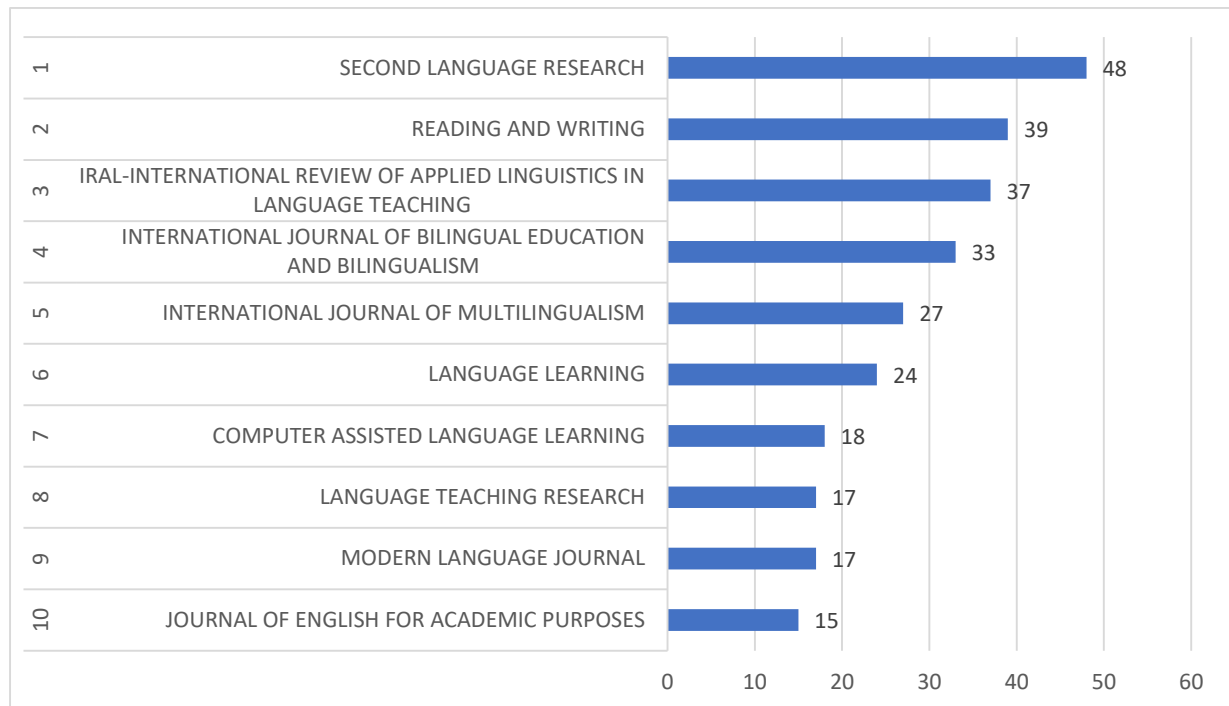


Figure 3: The top 10 journals publishing language transfer articles

Influential Citation Structure

Based on Table 1, it is evident that certain articles have exhibited a noteworthy influence. In particular, the work authored by James Cummins from the Ontario Institute for Studies in Education, entitled “Linguistic Interdependence and the Educational Development of Bilingual Children”, has garnered considerable attention, accumulating a total of 75 citations.

Table 1: Most cited article from 2012-2023

Rank	Article	DOI	TC*
1	Cummins J, 1979, <i>Rev Educ Res</i> , V49	10.2307/1169 960	75
2	Durgunoglu Ay, 1993, <i>J Educ Psychol</i> , V85	10.1037/0022-0663.85.3.453	42
3	Melby-Lervag M, 2011, <i>J Res Read</i> , V34	10.1111/J.1467- 9817.2010.01477.X	38
4	Bardel C, 2007, <i>Second Lang Res</i> , V23	10.1177/0267658307077080557	37
5	R Core Team, 2021, <i>R Lang Env Stat Comp</i>	NA	35
6	Rothman J, 2011, <i>Second Lang Res</i> , V27	10.1177/0267658310386439	34
7	Cohen J, 1988, <i>Stat Power Anal Behav</i>	NA	32
8	Westergaard M, 2017, <i>Int J Bilingual</i> , V21	10.1177/1367006916648859	31
9	Rothman J, 2015, <i>Biling-Lang Cogn</i> , V18	10.1017/S136672891300059X	30
10	Wang M, 2006, <i>J Educ Psychol</i> , V98	10.1037/0022-0663.98.3.542	30

Notes: *TC is Total Citation

The article argued that it is essential to adequately develop the L1 skills to allow for L2 to be developed adequately in children. The author suggested this by arguing that competent development in L2 is influenced by the development of skills in L1. In addition, there is a certain threshold of linguistic competence that must be achieved to ensure that children will be able to avoid cognitive disadvantages and allow bilingualism to influence cognitive and academic functioning.

The Keywords Analysis of Research Hotspots on Language Transfer Studies

The authors explored the content through an analysis of keyword distribution. The exposition includes the presentation of a network map depicting the co-occurrence of keywords, the enumeration of the top eleven keywords prevalent within language transfer publications, the provision of a visualization map elucidating keyword density, and ultimately, the delivery of a timeline representation detailing the temporal progression of these keywords.

Keywords co-occurrence can effectively reflect the research hotspots in the discipline fields, providing auxiliary support for scientific research (Li, et al., 2016). In all the 1259 language transfer publications, 4027 keywords were obtained altogether. The minimum number of occurrences of a keyword was 5 and 111 keywords meet the threshold.

The keyword co-occurrence network of language transfer (see Figure 4) was constructed by the VOSviewer software. The size of the nodes and words in Figure 4 represents the weights of the nodes. The bigger the node and word are, the larger the weight is. The distance between two nodes reflects the strength of the relation between two nodes. A shorter distance generally reveals a stronger relationship. The line between the two keywords represents that they have appeared together. The thicker the line is, the more co-occurrence they have. The nodes with the same color belong to a cluster. VOSviewer divided the keywords of language transfer publications into 4 clusters. The keyword “transfer” has the highest frequency of 66. Other keywords with a high frequency include “education” (33), “Phonology awareness” (28), and “Second language acquisition” (27).

The link strength between two nodes refers to the frequency of co-occurrence. It can be used as a quantitative index to depict the relationship between two nodes. The total link strength of a node is the sum of the link strengths of this node over all the other nodes. The node, “transfer”, has thicker lines with “multilingualism” (5), “Spanish” (5), “cross-linguistic influence” (5), and “English” (3). The relationships between “transfer” and “multilingualism” as well as “Spanish” imply the close integration of transfer and language influence. The relationships between “transfer” and “language learning strategies”, “motivation”, and “proficiency” reflect that language transfer studies mostly focused on English learning, learners, pedagogy and language itself. The top 11 keywords with their frequencies and total link strengths are shown in Table 2.

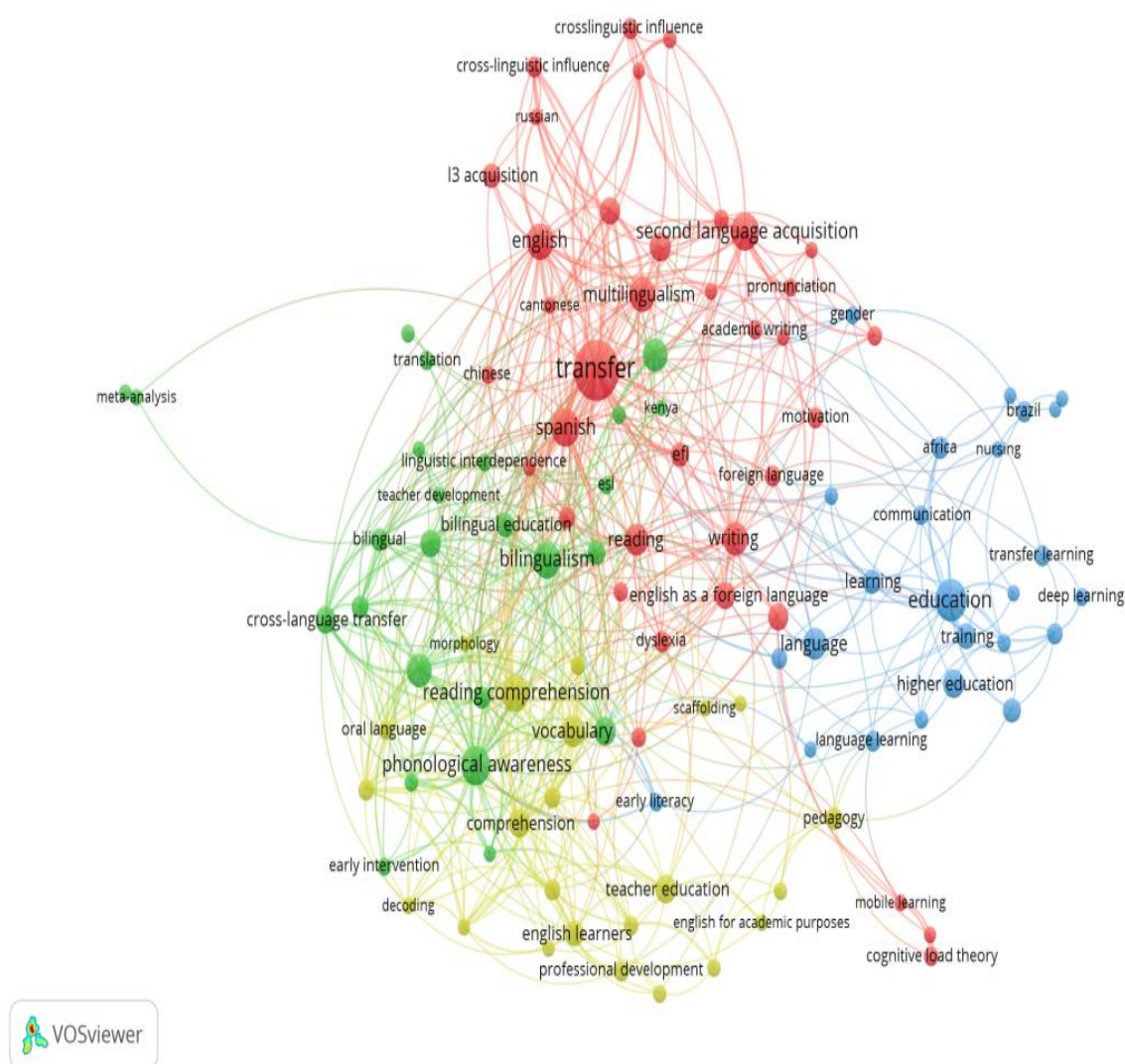


Figure 4: Keywords co-occurrence network of publications on language transfer

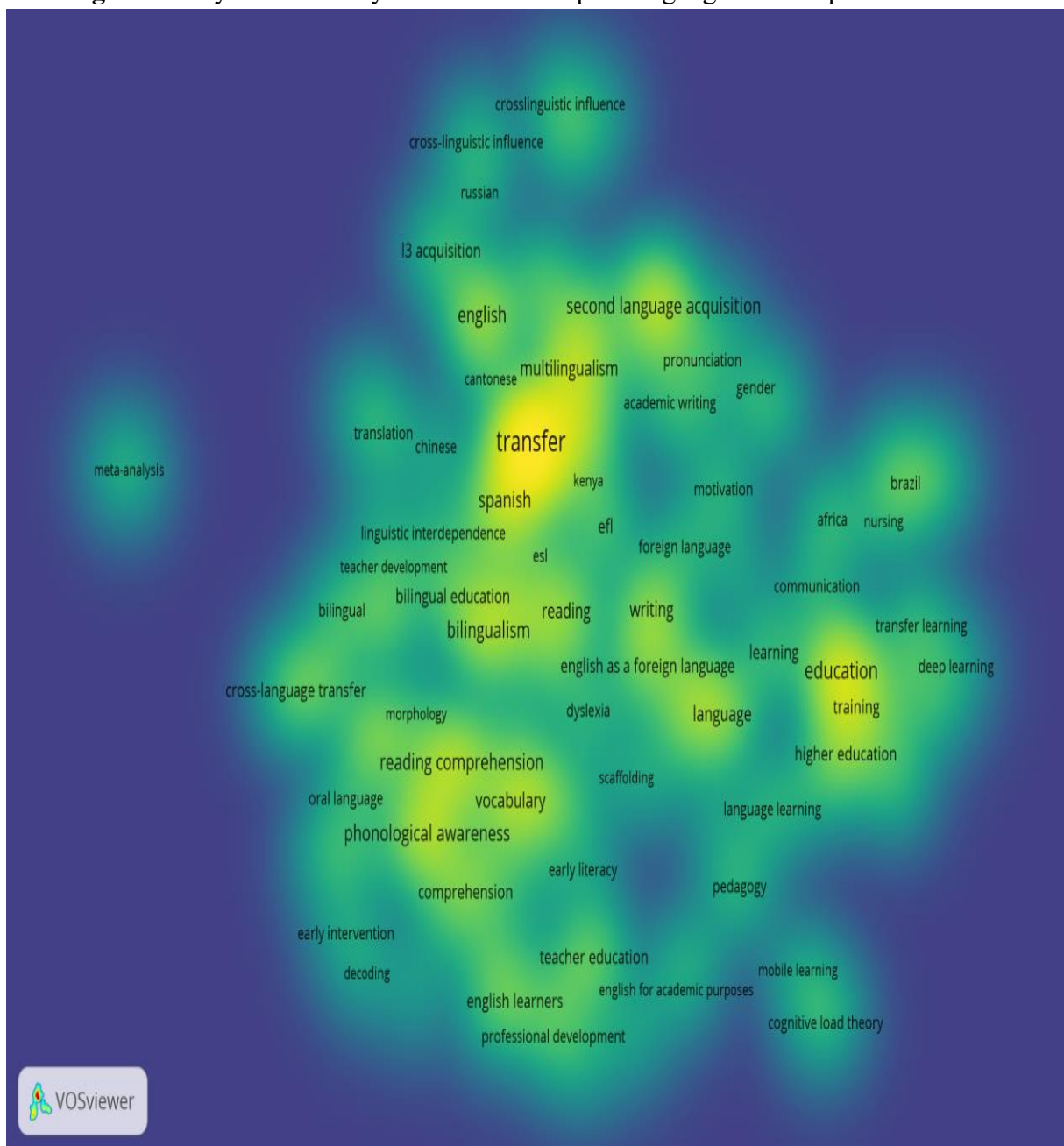
Table 2: The top 11 keywords of the language transfer publications

Rank	Keywords	Frequency	Total Link Strength
1	transfer	66	78
2	education	33	29
3	Phonology awareness	28	52
4	Second language acquisition	27	31
5	Spanish	26	55
6	English	25	48
7	Reading comprehension	24	48
8	bilingualism	24	44
9	multilingualism	23	43
10	writing	21	27
11	Morphological awareness	20	40

Density visualisation was generated through the utilisation of VOSviewer software (see Figure 5). Each node in the keywords density visualisation plat has a colour that relies on the density of items at that node. In other words, the colour of a node depends on the number of items in the neighborhood of the node. The keywords in the yellow colour area appear more frequently; on the contrary, the keywords in the green colour area appear less frequently.

Density views are especially useful for understanding the overall structure of a map and drawing attention to the most important areas in the map. From Figure 5, it can be seen that the research focuses of language transfer study intuitively. “transfer”, “second language acquisition”, “multilingualism”, “English”, “education training”, “Spanish”, “reading comprehension”, “writing”, “vocabulary”, “phonological awareness”, “teacher education”, and “English learners” turn out to be important. These keywords are the core keywords in the language transfer study.

Figure 5. Keywords density visualization map of language transfer publications



The timeline view was constructed using SATI, wherein the process involved the extraction of keyword frequency counts arranged by respective years. Table 3 reveals that from 2012 to 2016, the focus of keywords revolved around “bilingual”, “multilingual”, and “development”. The research conducted during this stage was primarily theoretical. However, since 2017, the research on language transfer has shifted towards more practical applications, resulting in a wide range of keyword types. Figure 6 is the co-occurrence network of the top 306 frequent keywords by VOSviewer. Combined Table 3 and Figure 6, it is noticeable that three main directions emerged: firstly, the examination of different aspects of language itself, such as “morphology”, “phonology”, “lexical”, and “writing”; secondly, the investigation of specific individuals, including “strategy”, “proficiency”, and “performance”; and thirdly, the exploration of teaching approaches from the perspective of educators, such as “instruction”, “assessment”, and “motivation”. This shift indicates a transition in language transfer studies from a theoretical approach to an empirical one. Notably, Chinese scholars have increasingly recognised the influence of the Mandarin mother tongue on second language learning. Table 3 provides a list of keywords found in publications on language transfer during different periods.

Table 3: *The keywords of publications on language transfer appeared during different periods*

Period	Keywords
2012-2016	acquisition, development, bilingual, read, multilingual, learn, Spanish
2017-2022	morphology, phonology, lexical, write, discourse, instruction, strategy, proficiency, performance, assess, teach, metaphor, motivation, third language acquisition, mandarin

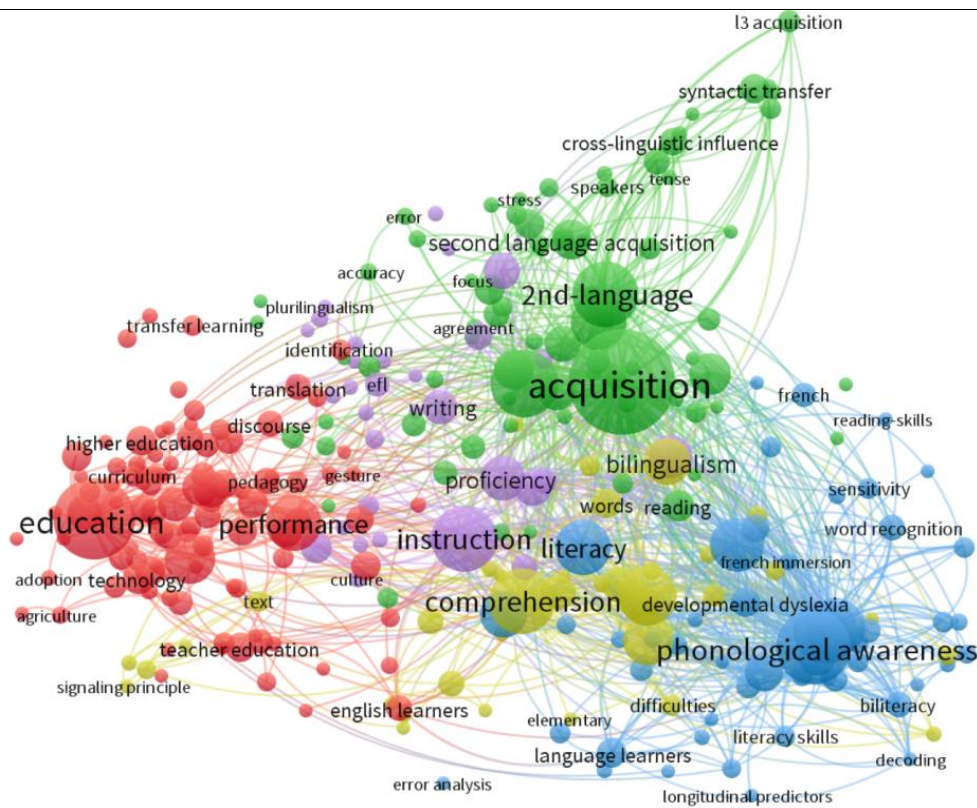


Figure 6. The co-occurrence network of the top 306 frequent keywords.

Co-citation analysis of sources

An analysis was conducted on a network of publications interconnected through co-citations. Out of the total 23,341 sources examined, a subset of 241 sources was identified, meeting the prescribed criteria of accruing a minimum of 30 citations. As illustrated in Figure 7, the co-citation analysis of these 241 sources led to the formation of four distinct clusters. The foremost cluster, encompassing 86 sources, emerges as the largest one, prominently featuring the likes of the *Modern Language Journal*. The subsequent cluster, comprised of 78 sources, constitutes the second-largest entity, incorporating journals such as the *Journal of Educational Psychology* and *Applied Psycholinguist*. The third cluster, consisting of 41 sources, is characterised by notable journals including *Science*, *Nature*, and the *Journal of Chemical Psychology*. The fourth and final cluster, also comprised of 41 sources, includes journals like *Language Learning* and *Second Language Research*.

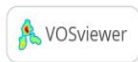
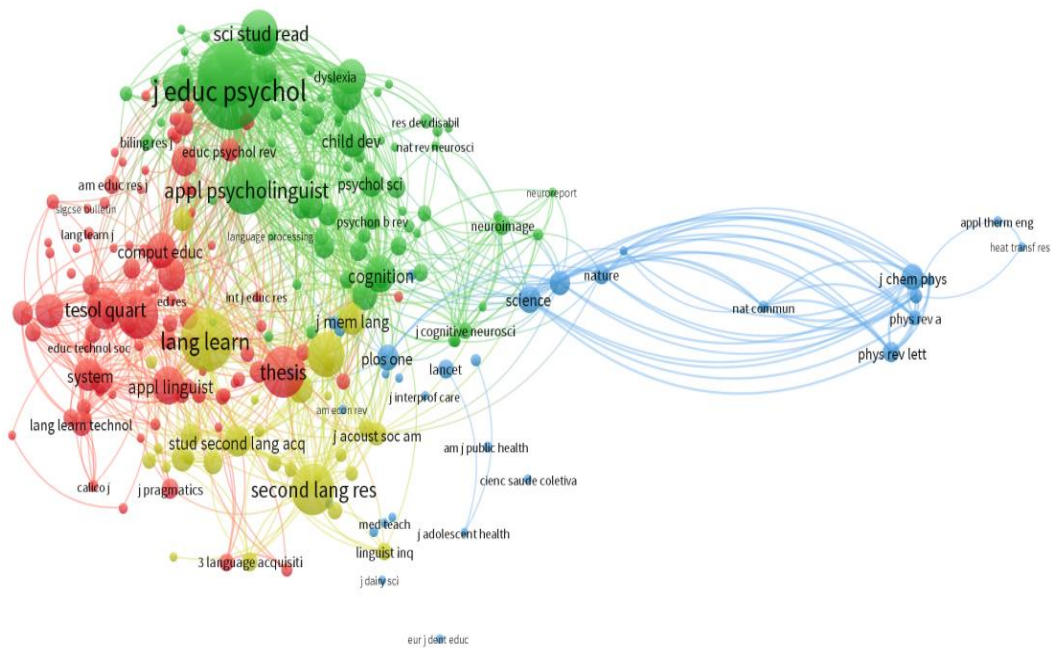


Figure 7. Co-citation network of sources.

DISCUSSION

The outcomes derived from this bibliometric analysis offer significant insights into the contemporary landscape of language transfer research. The key findings gleaned from this investigation are outlined as follows:

Firstly, it is evident that the volume of publications dedicated to the domain of language transfer research has exhibited a consistent and gradual escalation over successive years. Notably, there has been a discernible surge in publications post-2017. In terms of academic institutions, the University of Toronto emerges as the most prolific contributor to this discourse. The United States of America boasts the presence of five institutions within the top percentile in terms of publications pertaining to language transfer. Notably, the journal *Second Language Research* occupies the premier position amidst the spectrum of language transfer-focused journals.

Secondly, the scrutiny of keywords has unveiled a discernible shift within language transfer research from theoretical paradigms towards empirical frameworks. Evidently, three principal dimensions have gained prominence: the perspectives of language itself, language learners, and language teaching.

Lastly, it is pertinent to note that the significant work of Cummins (1979) stands as the most extensively cited contribution within the domain of language transfer. The *Modern Language Journal* emerges as the significant authority in the language transfer research sphere.

This bibliometric analysis provides an overview of language transfer research, highlighting current research trends and hotspots. The findings suggest that language transfer is a prominent area of investigation in the field of second language acquisition and language teaching. The identified research hotspots, such as the transfer of grammatical structures, lexical transfer, pronunciation transfer, and sociocultural factors, reflect the diverse aspects of language transfer explored by researchers. From a timeline view by extracting the frequency count of keywords by year, we can see that research on language transfer in the field of second language acquisition has evolved from focusing solely on the transfer of phonetics, vocabulary, and grammar to encompassing the study of learners and teachers. Researchers have broadened their perspective to include the role of learners and teachers in language transfer. They recognise that language transfer is not only influenced by the learners' native language but also by their cognitive processes, strategies, and previous language learning experiences. Additionally, the teaching strategies and techniques employed by teachers can play a significant role in either facilitating or impeding the transfer of knowledge from the learners' native language to the target language.

In a nutshell, research on language transfer has expanded beyond the study of phonetics, vocabulary, and grammar to encompass the role of learners and teachers in second language acquisition. By investigating the multifaceted nature of language transfer, researchers aim to enhance our understanding of how learners' native language influences their second language learning process. This knowledge can inform the development of effective teaching practices that promote successful language acquisition and minimise potential difficulties arising from language transfer.

CONCLUSION

This bibliometric inquiry provides a valuable perspective for comprehending the current landscape of language transfer research. Employing a rigorous examination of a carefully curated dataset comprising 1259 documents sourced from the Web of Science (WoS), this study adeptly identifies prominent areas of concentrated investigation and prevailing directions

within the domain. The findings not only enrich the comprehension of language transfer phenomena but also provide a foundation for future research and pedagogical practices in second language acquisition.

However, it is important to note that this analysis has certain limitations. The dataset was limited to the core collection of WoS, which may have influenced the representation of international research and perspectives. Additionally, the analysis focused on published documents and may not have captured ongoing or unpublished research. Future studies could consider expanding the dataset to include a broader range of sources and employing more advanced analytical techniques to further explore language transfer research.

In conclusion, this bibliometric analysis serves as a valuable resource for researchers, educators, and policymakers interested in the domains of language transfer and second language acquisition. It provides a comprehensive overview of the current research landscape and identifies potential directions for any forthcoming investigations.

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