

# A Study of Chinese Language Morphemes in the Perspective of Second Language Acquisition (1998-2024)

—Based on Bibliometric Analysis

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## Abstract

As morphemes are the smallest phonetic and semantic word formation units in Chinese, the study of morphemes has always been an important part of Chinese language acquisition research. Taking Chinese morphemes as the research object, this paper systematically examines the research status, research themes, research hotspots, research frontiers, and research methods of Chinese morphemes from the perspective of second language acquisition, based on 145 periodical literatures in the CNKI database in the last thirty years, and utilizes CiteSpace 6.3.R1 to conduct the metrological analysis. Currently, the research has problems such as a single research method and insufficient interdisciplinary integration. Future research can deepen the research by expanding the research object, deepening the research content, integrating the research methodology, and enhancing the interdisciplinary integration in order to promote the in-depth development of the research in this field.

## Keywords

Chinese Morphemes, Second Language Acquisition, Bibliometrics, Review

## 1. Introduction

The term “morpheme” was first used by the French linguist Joseph Vendryès in his book *Le langage: introduction linguistique à l'histoire*, where he introduced the terms *sémantème* and *morphème* in the first chapter of the second part, denoting lexical and grammatical meanings respectively. *Sémantème* is derived from *Semantique*, a term coined by the French linguist M. Bréal, where the root “*sémant-*” denotes “semantics” and the suffix “*-ème*” denotes “unit” or “element”,

which together means “semantic unit” or “semantic position”. Morphème, on the other hand, originated from the German scholar J. W. Goethe’s morphologie (morphology) modeled on botany or zoology, with the root “morph-” indicating “form” and the suffix “-ème” indicating “unit”, which together means “morphological unit” or “morpho position”. American linguists have objected to the special grammatical structure of Amerindian languages. They argued that Amerindian languages are “multimodal synthesizers” (also known as complex synthesizers), in which the meaning components of a sentence cannot form independent words, and that morphème should therefore be understood as the smallest meaningful combining linguistic unit. The American linguist Leonard Bloomfield (1933) mentions in *Language*:

*A linguistic form which bears no partial phonetic-semantic resemblance to any other form, is a simple form or morpheme. Every complex form is entirely made up, so far as its phonetically definable constituents are concerned, of morphemes. The meaning of a morpheme is a sememe. The linguist assumes that each seme is a constant and definite unit of meaning, different from all other meanings, including all other sememes, in the language, but he cannot go beyond this.*

With these definitions and descriptions, we can understand Bloomfield’s proposal that the morpheme is the smallest unit of meaning in a language, which can consist of one or more phonemes, but whose meaning cannot be further decomposed.

The introduction of the concept of morpheme in Chinese linguistics can be traced back to the Grammatical Innovation Movement of the late 1930s and early 1940s. Previously, grammatical studies of the Chinese language relied on the traditional “xiaoxue” approach, focusing on the phonetic and exegetical aspects of words, but lacking an in-depth analysis of language structure. During the Grammatical Renovation Movement, Chinese scholars began to try to apply structuralist theories and methods to analyze the Chinese language, to establish a scientific Chinese grammatical system. This change brought the concept of “morpheme” to the attention of Chinese scholars. The Chinese translation of this concept has gone through the development of “morphology, articulation, cisu, yusu”, reflecting the adaptation and adjustment between the Western linguistic concepts and the facts of the Chinese language.

In June 1939, Fu Donghua first mentioned morpheme in his *Open Letter to Mr. Chen Wangdao* published in the 34th issue of *Language Weekly*, corresponding it to the Chinese “word”. In the same issue of *Language Weekly*, Mr. Chen Wangdao responded to Fu Donghua by pointing out that morpheme was usually translated as “morphology” in grammar, but given the special characteristics of the Chinese language, he suggested the use of “articulation” as an alternative. In 1940, Chen Wangdao changed it to “yusu” in his work *Answers to Questions on Grammatical Reform* and further divided “yusu” into two major categories: “xusu” and “shisu”. He also called it “cisu” in *Grammar in brief*, arguing that “cisu” is the study of the method of word formation (from non-word to word, the configuration of “cisu”).

This is an example of the function of words. Chen Wangdao's concept of morpheme corresponds to the shift from "articulation" to "yusu" and "cisu". He regards "word" as the material unit of language organization and defines "morpheme" as the basic unit that constitutes the word, which reflects the tendency of the "word-based" view of language: the word is the core of language organization, and all other linguistic units are centered around the word. This view dominated the early studies of Chinese grammar. Later, Cao Pu (1947), Lu Zhiwei et al., (1956), Hu Yushu (1962) and others deemed that "morphemes are components of word formation".

Of course, there remains academic debate about the Chinese translation of linguistic terminology with some scholars contending that "morpheme" should be more accurately rendered as "yusu". This reflects the fact that the Chinese language is mainly characterized by monosyllabic morphemes, and it also reflects the essential difference in language structure between Chinese and Western languages. In 1958, Lv Shuxiang pointed out in *The Collected Works of Lv Shuxiang* that "morphemes are the smallest form of language, and any long speech can be analyzed into a single morpheme." "It was Mr. Zhu Dexi's suggestion to use 'yusu' as the translation of morpheme. It is usually translated as 'cisu', a name that always makes people think that it is analyzed from the 'word'. In fact, a morpheme is something more fundamental than a word. In a considerable number of languages, determining the number of words in a particular segment is often challenging. However, as the smallest meaningful linguistic unit, the term "morpheme" is translated as "yusu" in Chinese. This translation helps avoid potential misunderstandings associated with the term "cisu". For example, prominent Chinese linguists such as Zhang Zhigong in *Modern Chinese*, Zhu Dexi in *Lecture Notes on Grammar*, Xu Shu in *Semantics, Grammar System for Secondary School Teaching: Abstract*, and Gao Gengsheng in *Topical Studies on Chinese Grammar* have all adopted the "yusu" concept in their works.

In Western languages such as English, morphemes may be monosyllabic (as in "book") or polysyllabic (as in "cran-" in "cranberry"). In addition, many morphemes in Western languages require affixes (e.g. "-ing", "-ed") to reflect grammatical functions. In contrast, Chinese morphemes are mainly monosyllabic and many of them can be used independently. Therefore, the translation "yusu" is closer to the linguistic facts of Chinese, and more accurately conveys the core concept of morpheme. It is important to note that there is a school of thought that advocates for the concurrent utilization of the terms "cisu" and "yusu" in the study of modern Chinese. These two concepts are predicated on the structural components of vocabulary and the constituent elements of language units, respectively. Notable proponents of this approach include Fu Huaiqing's *Modern Chinese Vocabulary* and Liu Shuxin's *Lexicography of Chinese Description*.

The coexistence of the terms "cisu" and "yusu" reflects the diversity and complexity of the study of Chinese morphemes and provides theoretical support for different research perspectives. In this paper, from the perspective of morpheme's

multifunctionality in the language system, we believe that it is more appropriate to translate it as “yusu”. Unlike most scripts in the world, Chinese words consist of single or multiple characters that largely represent morphemes (>93%) (Dronjic, 2011). Morphemes and combinations of morphemes have been widely recognized as the most important morphological phenomenon and dominant word formation in Chinese (Ceccagno & Basciano, 2007). Therefore, the sorting out of the study of Chinese morphemes not only helps to deeply understand the lexical structure, word formation laws, and grammatical functions of Chinese but also has important significance for the development of Chinese language teaching.

The study of Chinese linguistic elements has been a subject of interest in the academic community for some time. Since the 21st century, the amount of literature on this subject has increased significantly, making it essential to systematically analyze its trends and key areas of research. Compared to traditional literature reviews, the use of bibliometric tools such as CiteSpace 6.3.R1 has become a more comprehensive and in-depth approach to measuring the research trends and scientific knowledge contained in the literature. This study focuses on the research on Chinese linguistic elements from the perspective of second language acquisition in the past twenty years. To ascertain the correlation between the keywords and the literature, the CNKI database was utilized as the source of information. The frequency of the keywords and the number of times they appear in the literature were documented, the literature was reviewed, and the key documents were analyzed to identify the topics that have been most frequently discussed. The objective of this study is to understand the development of the second language acquisition perspective in the field of linguistics over the past twenty years. This will provide a scientific basis for research in this field.

The questions that this paper attempts to answer are (1) What is the current state of research on Chinese morphemes from the perspective of second language acquisition? (2) What are the main research themes included in the highly cited literature? (3) What are the main hotspots of Chinese morphemes research from the perspective of second language acquisition in China? (4) What are the main contents of the research frontiers? (5) What research methods have been utilized in the study of Chinese morphemes from the perspective of second languages? (6) What are the shortcomings of the current research and the corresponding strategies?

## 2. Methodology and Data

### 2.1. Research Methodology

Firstly, in order to obtain a high search rate, the search condition was set as the topic = “Chinese morphemes”, the period as “1998 to 2024”, and the source category as “CSSCI”. Secondly, to improve the accuracy of the search, the conference papers, unknown sources, and documents with low relevance to the topic were excluded from the results, so as to reduce the interference of the search, and a total of 145 valid documents about Chinese morphemes were obtained. Finally, the an-

nual publications in the field of Chinese morphemes research were visualized in quantitative form by using the Excel spreadsheet tool. In order to achieve a more systematic and comprehensive review of the Chinese language morphemes research from the perspective of second language acquisition, and to further combine bibliometric analysis with content analysis to provide a systematic discussion based on specific topics and quantitative indicators embedded in them. This paper uses Citespace 6.3.R1 to analyze the selected literature in the CNKI database for content analysis of highly cited literature, analysis of keywords' centrality, and analysis of keywords' co-occurrence and emergence, to explore the relevance and hot trends.

## 2.2. Data Sources and Collection

The CNKI database contains a large amount of literature in many research fields such as social sciences and humanities, and this large volume of authoritative literature database is more suitable for bibliometric analysis. The time span of the text data for the current study was set from January 1998 to December 2024. The search was conducted according to the morpheme in the topic, and book chapters, conference papers, editorials, errata, monographs, and notes were screened out, focusing on authoritative journals such as *Language and Text Utilization*, *Chinese Language Teaching in the World*, *Language Teaching and Research*, *Modern Foreign Languages*, *Psychology*, *Psychological*, and *Behavioral Research*, etc. We obtained a total of 145 valid documents on Chinese morphemes.

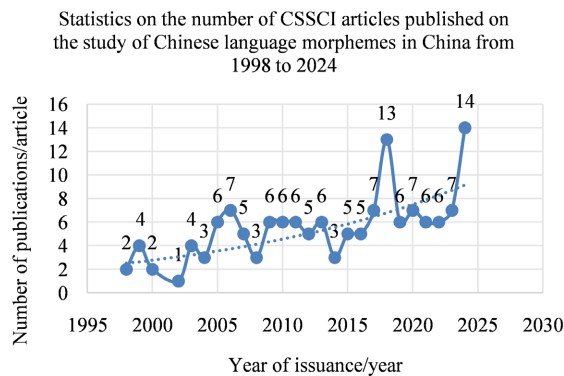
## 3. Results and Discussion

This study uses CiteSpace visualization and analysis software to systematically examine the current research status, research themes, research hotspots, research fronts, and research methodologies of Chinese language morphemes from the perspective of second language acquisition from 1998 to 2024. The annual publication volume from 1998-2024 is sorted out to reflect the current research status through the publication time and the number of articles; based on the index of cited frequency (frequency) of literature, the top 10 highly cited literature are integrated, and the research themes are elucidated accordingly. Keywords are a high-level summary of the research content of a document, and keywords with a high frequency are usually the hot topics of research in this field. Using the keyword co-occurrence map, we analyze the hot topics of Chinese morphemes from the perspective of second language acquisition. Citation burst refers to a large number of citations of a certain document in a short period in the field, and this index can help researchers understand the trend of academic research, and utilize the citation burst statistics to show the cutting-edge dynamics. Summarize kinds of 145 literature to summarize the important research methods from 1998-2024.

### 3.1. Status of Research

**Figure 1** presents the number of articles published on the study of Chinese mor-

phemes in China from 1998 to 2024. As can be seen from **Figure 1**, the number of articles published on Chinese morphemes research in more than twenty years has shown an overall upward trend, and the academic community has continued to pay attention to morphemes research and has continuously generated new discussions. The research on Chinese morphemes in the past thirty years can be roughly categorized into three stages, the development stage (1998-2013), the surge stage (2014-2018), and the slowing down stage (2019-2024).



**Figure 1.** Temporal distribution of the number of articles published on linguistic research (1998-2024).

The development stage from 1998 to 2013 was a period of continuous development, with the number of documents remaining at less than 10 per year. Research during this period mainly focused on morpheme teaching. Among them, 1998-2002 mainly focused on the relationship between morphemes and words, phrases and grammar and the role of morphemes in teaching and learning, while 2003-2008 conducted an in-depth examination of theories related to morphemes and lexemes in Chinese based on teaching and learning and formed a theoretical system of teaching Chinese as a foreign language. Frequency differentiation and morpheme analysis are the two main principles of vocabulary teaching in Chinese as a foreign language (Li & Wu, 2005). The teaching methods of “word-based” and “character-based” genres of vocabulary teaching in Chinese as a foreign language are closely related to morphemes (Li, 2005). From 2009 to 2013, on the basis of the continuation of the previous themes, new research themes emerged, and academics began to pay attention to the cognitive role of morpheme awareness in the acquisition of Chinese as a second language. For example, Peng Xiaochuan and Ma Yuki (2010) argued that morpheme awareness is one of the essential mindsets and strategies for teaching vocabulary in Chinese as a second language. The developmental stage explored the relationship and role of morphemes in relation to characters, words, grammar, and foreign language teaching, falling within the scope of traditional morpheme research. The emerging field of morpheme awareness research is traditional morpheme research. The emerging field of morpheme awareness research will become an important direction for the study of Chinese morpheme in the subsequent stage.

From 2014 to 2018, it entered a surge phase, with a significant increase in the number of articles published, mainly focusing on the role of the morpheme teaching method in vocabulary teaching and empirical research on morpheme awareness. The morpheme teaching method is a method of vocabulary teaching using morphemes, which associates word meanings by decomposing and processing morpheme meanings. Zhao Wei (2016) observed the applicability of the morpheme teaching method to different categories of words through the situation of lexical meaning memorization and proved the effectiveness of the morpheme teaching method of teaching on vocabulary memorization. The number of empirical research results on morpheme awareness has proliferated and shown a blow-out. The extant research has been primarily focused on two major areas: First, there has been a concerted effort to explore specific types of morpheme awareness such as compound morpheme awareness, homophonic morpheme awareness and homomorphic morpheme awareness. For instance, studies by Zhao Ying et al. (2016) have demonstrated that individuals who possess a strong awareness of homonyms can accurately identify the different meanings of homonyms across various linguistic contexts. Second, there has been a significant focus on the role of morpheme awareness in vocabulary acquisition and comprehension. Research in this area has revealed that morpheme awareness significantly impacts vocabulary learning. For example, Zhu Wenwen et al. (2018) concluded that there is a hierarchical progressive relationship between morphemic awareness, lexical meaning speculation and reading comprehension, with morphemic awareness contributing more to lexical meaning speculation ability. Morphemic awareness has a positive comprehension effect on reading comprehension, such as Chang Yun (2011) through a series of tests of phonological awareness, morphemic awareness, Chinese character naming and reading ability, the study found that morphemic awareness has an independent predictive effect on reading, while the role of phonological awareness is not significant.

Entering the convergence stage after 2019, Chinese morphemes continue to be dominated by morpheme teaching and morpheme awareness research. The teaching of morphemes is mainly based on empirical studies comparing the effectiveness of different teaching methods on learners' acquisition of Chinese vocabulary. For example, Zhang Bo (2020) argued that the morpheme teaching method should focus on the strong constructive force morpheme items and productive lexical patterns based on specific morphemes, and the chunking teaching method should focus on the idiomaticity of chunks and the correlation of linguistic constituents. Compared with the surge phase, the field of morpheme awareness has also explored the factors affecting morpheme awareness in depth based on the continuation of the previous research. For example, Liu Fengqin and Zhang Xiaoman (2021) found that morpheme position has a significant effect on homophonic morpheme awareness. Based on the statistics of the number of publications, the number of related academic papers in 2024 shows a positive growth trend, which not only demonstrates the broad prospect of the study of Chinese

morphemes, but also confirms the continued popularity of the field, and provides strong support for the subsequent innovative research.

### 3.2. Research Themes

**Table 1** shows the highly cited literature and its citation frequency of Chinese morphemes in the field of second language acquisition research. Highly cited literature plays a key role as an authoritative and recognized knowledge carrier in the same discipline. An in-depth and systematic exploration of cited literature can uncover the underlying knowledge structure and core components of the corresponding field of study and provide a theoretical foundation and guidance for subsequent research.

**Table 1.** The top 10 most highly cited documents in Chinese morphemes research.

Arrange in order	Literature	Frequency
1	Li Rulong, Wu Ming. Two Principles of Teaching Chinese Vocabulary as a Foreign Language[J]. Language Teaching and Research, 2005(2): 41-47.	537
2	Yuan Chunfa, Huang Changning. A study on Chinese morphemes and word formation based on morpheme database[J]. Linguistic Application, 1998(3):86-91.	284
3	Li T. Three major schools of thought in the study of vocabulary teaching in Chinese as a foreign language in the past ten years[J]. Language and writing application, 2005(S1): 9-11.	264
4	Zhou Jian, Liao Shuye. Chinese lexical systematicity and vocabulary teaching in Chinese as a foreign language[J]. Linguistic Application, 2006(3): 110-117.	181
5	Guo Shengchun. The role of Chinese morphemes in the acquisition of lexical meaning by international students[J]. Language Teaching and Research, 2004(6): 27-36.	158
6	Xing Hongbing. Statistical analysis of the morphemes of two-syllable synthetic words in the Vocabulary Level Outline[J]. World Chinese Language Teaching, 2006(3): 63-71+112+3.	149
7	Hao Meiling, Zhang Wei. The role of morpheme awareness in Chinese character learning for international students[J]. Chinese Language Learning, 2006(1): 60-65.	133
8	Peng Xiaochuan, MA Yukui. Awareness and Strategies for Teaching Chinese as a Second Language Vocabulary[J]. Language Application, 2010(1): 106-113.	90
9	Hong Wei. An empirical study of the influence of morphemic factors on international students learning of near synonyms[J]. Language Teaching and Research, 2011(1): 34-40.	84
10	Zhang Bo. The meaning and application of morphemes and chunks[J]. Language Teaching and Research, 2020(4): 12-24.	80

Based on the research themes, the above literature can be categorized into three directions: construction of morpheme databases, exploration of morpheme teaching and morpheme awareness. First, scholars conducted multidimensional descriptions of the attributes of Chinese morphemes, such as polysemy, word-forming ability, and word-forming capacity, to construct morpheme databases.

Based on the morpheme databases, quantitative analysis is applied to characterize the distribution of morphemes in different linguistic units and to analyze

the pattern of word formation and evolution of vocabulary in depth, so as to provide data support for the research. Yuan Chunfa and Huang Changning (1998) depicted the characteristics of Chinese morphemes, such as interpretation, category, word formation and non-word formation, and constructed a database of Chinese morphemes, so as to count the distribution of Chinese morphemes and analyze the structure of two-word compounds and their word formation patterns; Xing Hongbing (2006) on the basis of the *Chinese Language Vocabulary and outline hierarchy*, set up a database of disyllabic morphemes and started to statistically count and analyze their attributes. It was found that the formation of the morpheme system of Chinese as a second language learners would be influenced by the characteristics of the morphemes themselves. The construction of the morpheme database not only provides an empirical basis for revealing the internal structure of the Chinese morpheme system but also lays a solid data foundation for subsequent research on the relationship between morpheme awareness and vocabulary acquisition, reading comprehension and other aspects.

Secondly, in the area of inquiry on the teaching of morphemes, some scholars have examined the practical application and effectiveness of different pedagogical approaches. Li Tong (2005) summarizes three mainstream teaching paradigms: “word-based”, “character-based” and morpheme teaching method. The core difference between these three teaching philosophies lies in the choice of teaching base: “word-based” teaching takes vocabulary as the core unit and emphasizes the overall acquisition of vocabulary; “character-based” teaching focuses on the Chinese characters themselves and emphasizes the systematic relationship between their form, sound, and meaning; morpheme teaching method focuses on morphemes and emphasizes the analysis of their word formation functions and semantic combination rules. At present, the research on teaching methods focuses on the “word-based” and morpheme teaching method and shows the development of the integration of different teaching methods. Zhou Jian and Liao Shanye (2006) put forward the principle and strategy of vocabulary teaching by combining the lexical system; Peng Xiaochuan and Ma Yukui (2010) believe that vocabulary teaching takes the word as the basic unit and absorbs the positive aspects of the “character-based” and morphemic teaching method in a targeted way. Zhang Bo (2020) believes that the morpheme teaching method and the chunking teaching method are complementary in vocabulary teaching and should be used side by side. The research field of morpheme teaching centers on “word-based”, “character-based” and morpheme teaching method, deeply analyzes theoretical core concepts and application differences and promotes teaching methods from a single paradigm to integrated development.

In the field of morpheme awareness, scholars have examined the role of morpheme awareness in international students’ Chinese vocabulary acquisition. Empirical studies have shown that morpheme awareness has a significant impact on international students’ Chinese language learning. Hao Meiling and Zhang Wei (2006) found that homomorphic morpheme awareness had a predictive effect on

international students' Chinese character learning performance using paper-and-pencil tests with multiple regression statistical methods. Hong Wei (2011) further revealed that morphemic factors have an important influence on the learning of close-synonymized words by international students with different language backgrounds and different levels of Chinese proficiency. These research results not only deepen the understanding of the cognitive mechanism of morpheme awareness but also provide important theoretical basis and practical guidance for designing differentiated Chinese teaching strategies for different groups.

Overall, the existing studies have centered on the three aspects of morpheme database construction, morpheme teaching and morpheme awareness. In terms of the construction of morpheme databases, most of the current research takes them as the core tools for analyzing the attributes of morphemes, and the application of databases in the field of teaching Chinese as a foreign language has not yet been fully explored. In terms of research on morpheme teaching, although the academic community has explored the theoretical integration of "word-based", "character-based" and the morpheme teaching method, no empirical research has been carried out on the integrated teaching method, and there is a gap in the research on its concrete practical effects. In the research dimension of morpheme awareness, the existing results mainly focus on the specific categories of homomorphic morpheme awareness and homophonic morpheme awareness, while the cognitive mechanism of composite morpheme awareness is relatively weak, which is urgently needed to strengthen the systematic exploration of the academic community.

### 3.3. Research Hotspots

Keywords are the central summary of an academic paper, and by analyzing keywords, the topic of the paper can be understood more quickly. In the context of bibliometric analysis, the association between keywords can be expressed by the frequency of co-occurrence, the higher the number of co-occurrence of keywords in the same document, the closer the relationship between the research topics, which also proves that the academic community pays more attention to them. Betweenness Centrality (BC) as a measure of the efficiency of nodes in the network, the greater the BC value of the keywords usually has the greater impact on the development of the field, by the academic community to pay more attention to the common. Based on the analysis of keyword frequency and centrality value, it can systematically and intuitively grasp the research hotspots.

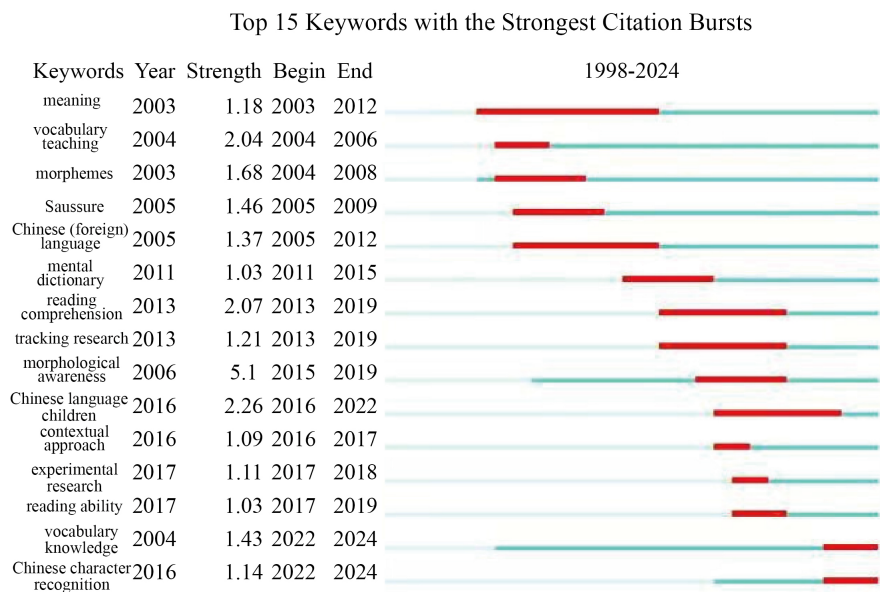
Figure 2 shows the keyword co-occurrence map of Chinese morphemes research from 1998 to 2024, in which the largest keyword node is morphemes, which fully indicates that morpheme tradition research has always occupied an important position in the field of Chinese morphemes research. Meanwhile, the keywords focus on the three core nodes of "morpheme awareness", "vocabulary teaching" and "reading comprehension", which proves that these three aspects have become the most important and hot research directions in Chinese mor-



### 3.4. Research Frontiers

According to [Chen et al. \(2014\)](#), research frontiers are a set of emergent dynamic concepts and potential research questions. Compared with general high-frequency keywords, emerging terms are more suitable for tracking emerging trends and mutational characteristics in a discipline. The research frontier must be comprehensively judged based on the analysis of emerging terms and the literature in which they appear.

**Figure 3** shows the mutation statistics of the 15 keywords with the highest mutation in the study of morpheme awareness from 1998 to 2024. The keywords are sorted according to the year of mutation. Morpheme awareness ranks first in terms of mutation intensity, indicating that morpheme awareness reflects the frontier of Chinese morpheme research and is an important factor affecting second language acquisition. In the research on morpheme awareness in second language acquisition, most articles mainly focus on three aspects: morpheme awareness and vocabulary acquisition, reading comprehension and the influence of morpheme properties on morpheme awareness. The relevant literature will be elaborated separately in the following.



**Figure 3.** Statistics on the 15 keywords with the highest emergence in linguistic research (1998-2024).

Chinese vocabulary mainly consists of compound words, and morpheme awareness can help learners extract word meanings from morphologically complex words, thus facilitating vocabulary acquisition. When encountering unfamiliar vocabulary, learners with good morpheme awareness can consciously dissect morphemic structures within the word and make use of known morphemic meanings to make meaning speculations ([Carlisle, 1995](#)), thus understanding and memorizing new vocabulary through known morphemes. Research in this area

covers two main aspects: one focuses on the influence and role of different dimensions of morpheme awareness on vocabulary acquisition; the other focuses on exploring the specific content of morpheme awareness that affects vocabulary acquisition. The former is committed to analyzing the role of different dimensions, such as homophonic morphemes, homomorphic morphemes and compound morphemes. Through extensive empirical research and theoretical analysis, it explores the internal mechanisms and patterns involved in the process of vocabulary acquisition. [Zhu Wenwen et al. \(2018\)](#) found that learners with strong homomorphic morpheme awareness have obvious advantages in Chinese word meaning speculation and reading comprehension. The latter digs deeper into the specific manifestations, the degree of influence and the path of action of morpheme awareness that plays a role in various aspects of vocabulary acquisition, such as vocabulary comprehension, memorization, and application. [Tang Ming \(2024\)](#) analyzed the lexical meanings of different types of vocabulary in different contexts by adult Chinese learners with different morpheme awareness abilities and different native language backgrounds. By analyzing the correct rate of guessing word meanings, the word guessing strategies employed, and the occurrence of guessing bias, it was concluded that morpheme awareness has a significant effect on the accuracy of word meaning guessing. Specifically, the high-ability group is more adept at combining word analysis strategies with contextual strategies to infer word meanings than the low-ability group, while the low-ability group employs more random guessing strategies. In terms of word-guessing bias, the high-ability group has far fewer biases at the morpheme level than the low-ability group.

In previous studies, many empirical studies revealed that morphemic awareness possesses a positive predictive effect on reading comprehension. To address the question of how morphemic awareness affects reading comprehension, [Wu Sina \(2017\)](#) found that among the three factors of vocabulary knowledge, morphemic awareness and lexical reasoning, vocabulary knowledge has the most significant and stable effect on reading comprehension. The indirect effect of morphemic awareness on reading comprehension was greater than its direct contribution, and this indirect effect was mediated by vocabulary knowledge and lexical reasoning. Subsequently, with the help of structural equation modeling, [Wu Sina \(2018\)](#) went on to confirm that morphemic awareness has both a direct effect on reading comprehension beyond the role of vocabulary knowledge and an indirect effect on it through vocabulary knowledge. Currently, the focus of research in this field has shifted to an in-depth and comprehensive investigation of the specific roles of different dimensions of homophonic morpheme awareness, homomorphic morpheme awareness, and compound morpheme awareness on reading comprehension. [Hao Meiling and Wang Fengjiao \(2020\)](#) categorized reading into three levels, namely, Chinese character reading accuracy, word reading accuracy, and word cut fluency. The results showed that homomorphic awareness has a close relationship with Chinese character reading accuracy and word reading accuracy and that learners who have better developed homomorphic awareness have a greater suc-

cess rate in reading learning. Wang Yongsheng et al. (2024) conducted a study on homophonic morphemic awareness, homomorphic morphemic awareness and compound morphemic awareness, in which homomorphic morphemic awareness was divided into morpheme identification awareness and morpheme discrimination awareness, and compound morphemic awareness was further divided into composite structure discrimination awareness, composite morpheme cut awareness, and composite morphemes combination awareness and the study showed that there are differences in the role of different morphemic dimensions of awareness on reading comprehension.

There have been many arguments in academic circles about the influencing factors of morpheme awareness, and many scholars have found that the attributes of morphemes influence the processing and recognition process of morphemes. The internal properties of morphemes are complex, including word formation ability, independent word formation ability, and morpheme meaning transparency, etc. They play a systematic and complex role in Chinese vocabulary processing and the development of morpheme awareness, which not only affects the development of learner's morpheme awareness but also directly relates to their recognition and memorization of morphemes, as well as the degree of mastery of the language. According to the classification of existing studies, the attributes of morphemes mainly include the following: (1) The ability of morphemes to form words independently and the ability to construct words. The ability of morphemes to form words independently and to participate in word formation affects learners' understandings and use of vocabulary composition; (2) Morpheme meaning related properties. The transparency and polysemy of morphemes' meanings are related to learners' accurate grasp of word meanings; (3) homophonic and homomorphic properties of morphemes. Homophonic morphemes and homomorphic morphemes are easy to confuse, but they can promote the associative learning of second-language learners; (4) morphophonemic and phonological family properties of morphemes. The ideograms of morphemes and phonemes, the size of the family of morphemes, and the role of phonological cues of phonemes all affect learners' cognition of morphemes; (5) Positional properties of morphemes. The semantic meaning and function of morphemes differ according to their positions in words; (6) The frequency property of morphemes. The frequency of morphemes in language use affects learners' exposure and familiarity. At present, the homophonic and homomorphic properties of morphemes as well as the properties of morpho-syntactic and phonological families are the key directions of research. Fengqin Liu and Xiaoman Zhang (2021) examined the developmental patterns and influencing factors of homomorphic morpheme awareness and found that morpheme position had a significant effect on homomorphic and homophonic morpheme awareness, while morpheme types did not. Ma Jing and Hao Meiling (2023) investigated the role of radical families in distinguishing homophonic morphemes. They found that second language learners of Chinese exhibit a significant radical family effect in the acquisition of radical knowledge, with high

accuracy rates for large radical families and relatively low accuracy rates for medium and small radical families, showing different developmental trends. The semantic cues provided by semantic components also help Chinese learners distinguish homophonic morphemes.

Overall, morpheme awareness not only affects learners' ability to recognize, memorize and infer second language vocabulary, but also directly relates to the development of reading comprehension and overall language proficiency. In terms of morpheme awareness and vocabulary acquisition, existing studies have explored the effects of different dimensions of morpheme awareness on specific aspects of vocabulary acquisition, but there is a lack of systematic comparative analyses of second language learners of different age levels and different native language backgrounds. In terms of morpheme awareness and reading comprehension, the differences in the role of morpheme awareness in specific text types can be further refined in the future, and the differences in the role of morpheme awareness in different contexts can be examined. In terms of the influence of morpheme attributes on morpheme awareness, although previous studies have revealed the important role of homophonic and homographic morpheme attributes in morpheme awareness, research in this area remains limited. There is a lack of comparative studies involving second language learners at different proficiency levels, comprehensive systematic research, and exploration of the interactive effects of multiple morpheme attributes. Future research on morpheme awareness needs to be further expanded in order to provide a more relevant and practical theoretical basis for morpheme teaching and vocabulary acquisition in Chinese as a second language.

### 3.5. Research Methodology

In the field of second language acquisition, the research methodology of Chinese morphemes has experienced a shift from non-empirical research to empirical research focus. Zhang & Liu, (2019) categorized research paradigms into two main categories: expository research and empirical research. Discursive research introduces relevant theories or puts forward its own viewpoints in response to the research problem, which is a subjective presentation, while empirical research uses quantitative, qualitative, or a combination of both methods to collect data and analyze the problem based on objective data. Based on this categorization framework, this paper further refines the research methods into non-empirical research and empirical research. Non-empirical research mainly expresses opinions through discursive thinking, and less often presents a complete argumentation process from data and information to conclusions. Empirical research emphasizes the formation of quantitative data or qualitative materials as the support of conclusions and shows the argumentation process in the paper (Zhu & Hao, 2023). Non-empirical research paths such as theoretical exploration, literature review, and commentary, etc., and empirical research paths contain quantitative research, qualitative research and mixed methods. From the perspective of the three stages

of development, surge and slowdown in the study of Chinese language morphemes, most of the research in the development stage stays at the level of non-empirical research, such as literature combing, theoretical analysis and review, and scholars are mainly committed to systematically organizing the literature related to Chinese language morphemes and analyzing the connotations and values of different theoretical perspectives, and there is a relative lack of empirical research. In the surge phase, the number of non-empirical studies decreases dramatically, and the number of empirical studies increases rapidly and gradually dominates. At the convergence stage, empirical studies continue to dominate, exploring the mechanism of Chinese morphemes in vocabulary acquisition, reading comprehension, and other domains by observing and testing participants' behaviors, with quantitative studies as the focus and relatively few qualitative studies.

In the scope of empirical research, techniques such as eye-tracking and EEG research are utilized. Eye-tracking is characterized by real time, accuracy and naturalness, which can capture the subject's attention allocation while processing the verbal information in real time and intuitively, and record the subject's visual attention process in real time; eye-tracking can be accurate to the millisecond level, and it can record the subject's gaze point, gaze time and eye movement trajectory in detail, thus providing accurate data analysis. In eye-tracking experiments, the subject usually experiments in a relatively natural state, which helps to understand the subject's cognitive process in the real environment. Wang Yongsheng et al. (2024) used eye-tracking technology to record the process of reading sentences and chapters by second-language Chinese learners, dynamically reflecting the role of morpheme awareness in reading comprehension. With the rise of cognitive science and neurolinguistics, EEG research has been gradually applied to the field of linguistics. EEG research focuses on the correlation between brain electrical activity and psychology and behavior, explains the brain's implementation of encoding and decoding processes of morphemic meaning and morpheme awareness, and provides a new perspective for the study of Chinese language morphemes from the level of neuroscience. Using EEG research, Wang Xiaolu and Cheng Heben (2021) conducted an in-depth investigation of the differences between second-language Chinese learners and native Chinese speakers in the processing of Chinese characters from two key aspects, namely orthographic processing and phonological processing.

In addition, the data collection methods in this field are mainly based on questionnaire surveys and corpus analysis. As a traditional method in Chinese morpheme research, questionnaire surveys have unique advantages in revealing the learning background, cognitive patterns, and learning strategies of second-language learners of Chinese. They serve as an important tool for empirical research. For example, Zhao Wei (2018) used questionnaire surveys to investigate learners' intuitive perceptions and acceptance of the advantages and disadvantages of two vocabulary teaching methods, the morpheme teaching method and the context teaching method, thereby corroborating the conclusions of objective tests. With

the development of computer technology, the corpus has become a research tool for Chinese morphemes from the perspective of second language acquisition. Relying on the construction of large databases, corpora summarize the characteristics or situations of native or learner language use and explain the laws of language use through in-depth statistical analysis of samples, such as Yuan Chunfa & Huang, (1998) and Xing Hongbing (2006). Meanwhile, corpus can also be a source of data for empirical research, providing objective data support and promoting the quantitative development of Chinese morphemes research. For example, Wang Juan and Xing Hongbing (2010) randomly selected polysemous morphemes as experimental materials from the Monosyllabic Morphemes Database in the database of the *Chinese Language Proficiency Vocabulary and Chinese Character Level Syllabus* and investigated the issue of the family of polysemous morphemes.

The research methodology of Chinese morphemes has made great development in the last three decades. Although at present, empirical research dominates, qualitative research develops more slowly, and future research should focus on combining quantitative and qualitative research to comprehensively explain the intrinsic laws of Chinese language acquisition. Meanwhile, combining cognitive linguistics, psycholinguistics, neurolinguistics and computational linguistics and other disciplines, eye tracking and electroencephalography studies have been utilized, although further deepening of the investigation is needed in the future to understand the processing mechanism of Chinese morphemes in foreign teaching, vocabulary acquisition, and reading comprehension in a more in-depth and comprehensive way.

### 3.6. Prospects for Research

By statistically analyzing the annual publications, research themes, research hotspots, research frontiers and research methods of Chinese morphemes research from 1998 to 2024, this study finds that the research on Chinese morphemes in the field of second language acquisition is still deficient in the following ways: 1) A single research method. Currently, in morpheme research, the analysis of morpheme attributes relies on traditional literature analysis. Take the study of morpheme semantic evolution as an example. Relying solely on literature review makes it difficult to grasp the changes in morpheme semantics in actual use. Furthermore, due to the lack of large corpus evidence, the reliability of research results is affected to a certain extent. In the field of empirical research, quantitative analysis dominates, while qualitative research methods are relatively less used. 2) The level of interdisciplinary integration is not deep enough. The study of Chinese morphemes has involved the fields of education and psychology, but the interdisciplinary research only stays in theoretical references and simple data comparison. When constructing a cognitive model of morphemes, psychological cognitive theories and experimental evidence from neuroscience were not fully integrated, resulting in an incomplete explanation of the cognitive processing mechanisms of

morphemes. This prevented the formation of a systematic interdisciplinary theoretical framework, limiting further research.

In view of the current research findings, this paper proposes the following coping strategies. First, expand the dimensions of the research object. Strengthen the research on learners with different native language backgrounds. There are significant differences between different native languages in terms of language structure and morpheme system, etc. Taking zero-based learners from the Chinese character culture circle and non-Chinese character culture circle as an example, the efficiency and quality of Chinese language acquisition in the same period are different due to the differences in the characteristics of their native languages. In the future, learners of different age levels, educational backgrounds and motivations can be selected as research objects to comprehensively and deeply reflect the characteristics and patterns of different groups in the process of Chinese language acquisition. Second, deepen the level of research content. Carry out research on the dynamic development of the cognitive processing mechanism of Chinese language morphemes on second language acquisition, collect data through questionnaires, cognitive tests and learning process tracking, and use regression analysis and other statistical means to determine the influence weights of each factor. At the same time, focusing on the research of morpheme awareness, we dig deeper into the influence of the interaction of multiple morpheme attributes on morpheme awareness, and expand it from vocabulary acquisition and reading comprehension to other fields. Strengthen the research on morpheme semantics and pragmatics, analyze the understanding and application bias of Chinese morpheme semantics in different contexts, collect natural corpus (e.g., learners' oral communication and writing samples) and experimental corpus (e.g., contextual word-filling and sentence rewriting tasks). We explore the acquisition of semantic extensions and pragmatic constraints by applying the theory of semantic field and the principle of pragmatics and compare the differences between native speakers and learners. Third, integrate multiple research methods. The study of Chinese morphemes should increase qualitative research methods and strengthen the combination of quantitative and qualitative research. Qualitative research methods emphasize the use of interviews, observations, case studies and other methods to collect rich materials. Taking Chinese learners with different native language backgrounds as an example, quantitative research through experimental tests can be used to argue the universal laws and quantitative relationships of Chinese language acquisition, and at the same time interview them about their cognitive processes, learning strategies, and difficulties and challenges they encountered during the process of learning Chinese morphemes, to reveal in depth the influences such as individual differences, cognitive processes, cultural factors, and so on, behind these laws. In the process of quantitative research, we can make use of cutting-edge technology, using eye-tracking technology to observe in real time the visual attention allocation of learners when they read Chinese-linguistic related materials; and with the help of electroencephalography or functional magnetic resonance

imaging (fMRI) technology, we can detect the neural activities of the brain when processing Chinese-linguistic materials, and carry out a comprehensive analysis in combination with the behavioral data, in order to reveal the cognitive neural mechanisms of Chinese-linguistic acquisition. Fourth, enhance interdisciplinary integration. Based on linguistic theories, the study of Chinese language morphemes can further introduce the theoretical model of cognitive psychology, draw on the processing mechanism of psycholinguistics, strengthen the combination with neuroscience, rely on natural language processing technology, and construct large corpus, etc., so as to break down the barriers of disciplines, integrate the research resources, and help Chinese language morphemes research to be The research results of Chinese morphemes should be practically applied.

The research results of Chinese morphemes should be practically applied to teaching practice. In future Chinese language teaching, Chinese teachers should focus on the teaching of morphemes, analyze the function of morphemes and semantic combinations, and draw on the advantages of the “word-based” approach that emphasizes the acquisition of vocabulary as a whole, and the “character-based” approach that emphasizes the phonological, morphological, and semantic correlation of Chinese characters; they should also strengthen the cultivation of the awareness of morphemes and conduct homomorphic morphemes, homophones and homophonies. They should strengthen the development of morpheme awareness, carry out homomorphic morpheme and homophonic morpheme identification teaching, enhance students’ ability to identify confusing morphemes, and guide students to learn how to analyze the morphemes in compound words, so as to improve the efficiency and quality of vocabulary acquisition, and further enhance reading comprehension ability. In addition, Chinese language teachers should pay attention to the differences between students with different native language backgrounds and different levels of Chinese language proficiency, formulate personalized teaching plans to better meet the diverse learning needs of students, and effectively promote the high-quality development of Chinese language teaching.

#### **4. Concluding Remarks**

Research on Chinese morphemes has been conducted since modern times and has developed rapidly throughout the country over the past two decades. However, there has been little comprehensive research on Chinese morphemes from the perspective of second language acquisition. The purpose of this study is to analyze the macro-development of research results on Chinese morphemes in the perspective of second language acquisition from 1998 to 2024 using quantitative bibliometric visualization methods and CiteSpace software. By collecting 145 valid literatures on Chinese morphemes in the CNKI database during this period, we used high citation analysis, co-occurrence analysis and emergence analysis to determine the distribution of the time of issuance, research themes, research hotspots, research fronts, and research methods of Chinese morphemes. In view

of the shortcomings of the current research, specific suggestions are put forward in terms of research objects, research contents and research methods, with a view to promoting the research in this field to a new height, providing a more solid theoretical foundation and practical guidance for the teaching and learning of Chinese as a second language, and facilitating the continuous development of the research on Chinese language education in the international arena.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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