A Review of Domestic Research on English Vocabulary Knowledge (2000-2022)

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Abstract: *Vocabulary knowledge is an important construct in second language acquisition. This study is designed to conduct a visualized review of studies on English vocabulary knowledge at home from 2000 to 2022 derived from the CNKI database by employing the data analysis tool of CiteSpace 6.1.R3. As the scientific knowledge maps show that domestic research on English vocabulary knowledge developed fast in the first decade of the 21th century but it lost momentum in the past twenty years since its hotspots were generally limited within only a few topics like vocabulary breadth, depth and acquisition, and even within these topics there were some gaps requiring in-depth analysis. Based on the interpretation of these findings, this study proposes four possible fronts that might steer future research and promote further development of English vocabulary knowledge at home.*

Keywords: *English vocabulary knowledge; vocabulary depth; vocabulary breadth; visualized review; CiteSpace*

1. Introduction

Vocabulary knowledge is a complex construct involving multidimensional components of knowing a word[1]. It is generally accepted that Richard was the first scholar who proposed this construct and explored the aspects of vocabulary knowledge. However, Richard's[2] classification of vocabulary knowledge components is less systematic for the application in related studies. Therefore, various frameworks of vocabulary knowledge have been constructed. Among these, the most well-accepted ones are Anderson and Freebody[3] and Nation[4]. Anderson and Freebody believed that vocabulary knowledge compromised two dimensions, breadth and depth. The breath of vocabulary knowledge refers to the size or quantity of vocabulary while the depth of vocabulary knowledge refers to the quality or in-depth understanding of vocabulary. Different from Anderson and Freebody, Nation's framework was derived from Richard's but with more systematic and comprehensive classification. Nation divided vocabulary knowledge into three categories in terms of form, meaning and function, each with two subcategories, receptive knowledge and productive knowledge.

With the support of well-established theoretical frameworks, more and more researchers and pedagogical specialists conduct empirical research to explore the components of vocabulary knowledge and the acquisition of vocabulary knowledge. Domestic researchers started their studies on vocabulary knowledge at the end of 1990s and gradually emerged as a new hotspot in second language acquisition, especially in the sphere of EFL (English as a Foreign Language) [5]. However, as a growing amount of research focus on English vocabulary knowledge, only a few studies review its diverse topics and fruitful findings. Notably, the existing reviews generally specialized in certain domains of English vocabulary knowledge, like its depth and breadth[6]. Though several studies provided more comprehensive reviews of English vocabulary knowledge[7] and vocabulary acquisition[8], recently conducted studies are definitely out of their range. In addition, the existing reviews are mainly based on qualitative analysis with a small number of studies involved due to the limitation of manual statistics while quantitative review in this field still remains unexplored.

Systematic scientometric reviews has been a fast-growing trend in scholar communication to achieve computational and visual analysis of larger quantity of literature reviews[9]. In this regard, the present study endeavors to demonstrate the visual analysis of domestic research on English vocabulary knowledge from 2000 to 2022 derived from CNKI database. With the usage of CiteSpace, scientific maps are generated to reveal the development trends and hotspots of vocabulary knowledge at home. In particular, this study summarizes existing findings in order to identify neglected aspects and suggest the fronts for future studies.

2. Research methodology

2.1 Instrument

The data analysis tool used in this study is CiteSpace 6.1.R3 designed by Professor Chaomei Chen. This software can support visual exploration of a research field and generate overview landscape of its development patterns and trends. These functions are achieved by processing citation data from databases like Web of Science, CSSCI, and CNKI to demonstrate scientific knowledge maps like co-citation, cluster, timeline, and burst.

2.2 Data collection

Literature involved in this study is collected from domestic journals in CNKI database. *Vocabulary knowledge* (in Chinese *cihuizhishi*) and *English* (in Chinese *yingyu*) are used as keywords to search for relevant studies written in Chinese. Under this circumstance, 937 studies are found, but considering other conditions like the types of studies and journals only 647 studies are left. Among which, there are 251 studies derived from CSSCI. The published year of selected studies ranges between 2000 and 2022. This time period is chosen because English vocabulary knowledge started to gain more and more attention at the beginning of 21th century as showed in the database. The download date of data is December 20, 2022.

2.3 Data processing

The citation information of data from CNKI is first transformed by CiteSpace 6.1.R3 and then processed to conduct the analysis of clusters, timeline and bursts. The scientific knowledge maps and relevant tables are shown in the following part.

3. Results and discussion

3.1 Development history of vocabulary knowledge studies

The number and year of published domestic studies concerning a certain research topic can represent its development history and level of research to some extent[10].

Figure 1. Published studies on vocabulary knowledge from 2000 to 2022

Figure 1 suggests that there was a fast-growing trend of studies on English vocabulary knowledge in the first decade of the 21th century and the number reached its peak at the year of 2009 with 63 studies published in journals. From 2010 to 2022, the number of published studies was in a dynamic pattern generally with one year of increase and one year of decrease exchanging in turn. However, since 2020 the number of published studies keeps falling for three consecutive years. In general, the figure demonstrates that domestic research on English vocabulary knowledge won its significant position with an upsurge in number from 2000 and 2010, but the fast-growing trend did not last long. During the 2010s, English vocabulary knowledge still received enough attention from researchers at home for its further development though the topic had lost its momentum in being a hotspot. What's more, the research topic pf vocabulary knowledge became even more unnoticed after 2020. It can be seen that the number of published studies on English vocabulary knowledge dropped with an observable rate and did not

experience another increasing period shortly after it reach its summit. However, thirty years of development is certainly not adequate for this research topic to be fully explored[11]. Therefore, more attention should be given to the development of vocabulary knowledge including both theoretical and empirical aspects and domestic scholars should explore new point of view to renew this research topic.

3.2 Major themes of vocabulary knowledge studies

Figure 2 is the scientific knowledge map of clusters generated by CiteSapce which can automatically identify keywords of literature according the co-citation network among all literature so as to visualize the focused topic in a certain research field.
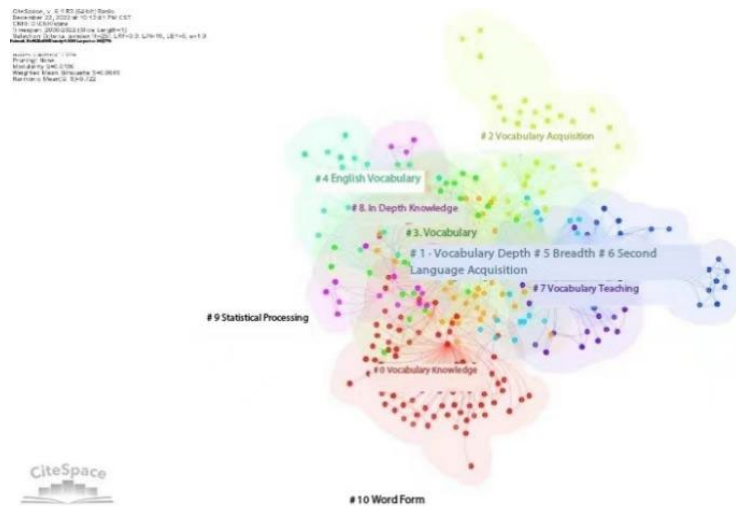

Figure 2. Clusters of vocabulary knowledge

The Modularity Q (0.6196) and the Weighted Mean Silhouette S (0.8629) in figure 2 are both bigger than 0.4, suggesting that the clustering map presents an ideal effect[12]. Table 1 illustrates detailed information of the key 11 clusters of English vocabulary knowledge in domestic research. The bigger the cluster ID is, the smaller the size of nodes of a certain cluster is. So does the attention given to the cluster type. Besides, the top terms in each cluster are also included in Table 1. According to these top terms, the top 11 clusters are simplified and reorganized into four major research themes: vocabulary depth (cluster 0, 1, 3, 4, 5, 8, 10), vocabulary breadth (cluster 1, 5), vocabulary acquisition (cluster 2, 3, 6), and vocabulary teaching (cluster 3, 7).

Table 1. Detailed information of the top 11 clusters

Cluster ID	Size	Silhouette	Top Terms (LLR)
0	80	0.9	vocabulary knowledge; relevance; vocabulary depth
1	52	0.794	Vocabulary depth; vocabulary breadth; collocation
2	45	0.837	Vocabulary acquisition; college English; vocabulary competence
3	34	0.911	Vocabulary; teaching; acquisition depth
4	28	0.898	English vocabulary; in-depth study; mobile learning
5	28	0.834	Vocabulary breadth; vocabulary depth; vocabulary size
6	25	0.906	L2 acquisition; learner; native-like
7	24	0.742	Vocabulary teaching; strategy; primary English
8	24	0.91	Depth knowledge; corpus; translation
9	5	1	Statistic processing; vocabulary network; e-dictionary
10	5	1	Word form; semantic errors; form-meaning

3.2.1 Vocabulary depth

Under the theme of vocabulary depth, domestic research generally focuses on three aspects. The first aspect is the relevance between vocabulary depth and breadth. Some studies suggest that vocabulary depth is highly and positively correlated to vocabulary breadth but learners' depth of vocabulary knowledge always falls behind one's breadth of vocabulary knowledge and the positive correlation varies with learners' vocabulary level[13]. These results are caused by the difficulty of acquiring vocabulary

depth and learners' overemphasis on vocabulary depth for rapid expansion of vocabulary size[14]. The second aspect is the measurement of vocabulary knowledge. It has been argued that vocabulary knowledge is hard to measure and the instrument used to measure vocabulary depth varies in different contexts with different participants and research purposes. Therefore, researchers are exploring a set of standard tests for the measurement of vocabulary knowledge so as to make the results of different studies more comparable[15]. The third aspect is the components of vocabulary depth. As mentioned previously, vocabulary depth includes three dimensions, each with receptive knowledge and productive knowledge below. Considering the complex of such a framework, most studies focus on one or two dimensions or simply receptive knowledge and productive knowledge. In particular, the meaning-form link of word are most favorable topics for researchers as showed in Cluster 10 and studies suggest that productive knowledge is more difficult for learners to acquire than receptive knowledge[16].

3.2.2 Vocabulary breadth

As for the theme of vocabulary breadth, also called vocabulary size is one aspect theoretically paralleling with vocabulary depth and closely related to it. Thus, research on vocabulary breadth is either studies in different contexts or its relevance to vocabulary depth. Other popular research topics are the development process of vocabulary depth which provide practical suggestions for vocabulary teaching and learning[17] and the effect of vocabulary breadth on language activities, especially English reading comprehension[18].

3.2.3 Vocabulary acquisition

Vocabulary acquisition refers to the acquisition of vocabulary knowledge components. Under this research theme, there are two sub-topics involving the difficulty of acquiring different components of vocabulary knowledge and the order of acquiring different components. Similarly, studies draw a common conclusion that vocabulary breadth is easier to expand than vocabulary depth and receptive knowledge is easier to acquire than productive knowledge. However, concerning the order of acquiring various vocabulary knowledge components, results are inconsistent. While some studies believed that the simultaneous acquisition of word' form and meaning, the random acquisition of word' synonyms, derivations and collocations and at the early stage of learning the acquiring of word's meaning even goes faster than word' form, other studies pointed out specified order: the acquisition of part of speech comes first, followed by word's meaning and derivations[19]. The other issue lies in the over-exploration of certain components of vocabulary knowledge like word's meaning, form and derivation while investigating other vocabulary components like collocation and association are seldom addressed. As for the participants of research, college students are largely involved while high school students and primary school students are relatively less examined.

3.2.4 Vocabulary teaching

Vocabulary teaching is a more empirical topic since it addresses teaching of vocabulary. More and more researchers emphasize the importance of teaching of vocabulary depth rather than teaching vocabulary breadth alone. These studies explore the effect of teaching strategies from the perspective of both teachers and students. Different from vocabulary acquisition, the construction of teaching strategies is usually carried out in the classroom of primary school rather than higher education. Studies suggest that strategies like output task[20], incidental acquisition[21], flipped classroom[22] and corpus-based learning[23] all improve students' acquisition of vocabulary knowledge to some extent.

3.3 Hotspots of vocabulary knowledge studies

3.3.1 Timeline analysis

The scientific knowledge map of timeline can reveal the change research hotspots in a certain field during a specific time period. Figure 3 shows that over the past thirty years though research on English vocabulary knowledge at home started at the beginning of the 21th century, it developed quite fast to gain its prominent position in research. It can be seen that the connection between different nodes and the number of new nodes is more sparse in the 2010s than in the 2000s. In addition, few nodes developed to be significant keywords. However, in general the network is complex and entangled suggesting that English vocabulary knowledge at home is prosperous and interdisciplinary. As for specific nodes, vocabulary size was analyzed earlier than vocabulary depth but later the highlight transferred to vocabulary knowledge. Luckily, as more attention was given to vocabulary depth, research on vocabulary breadth also thrived again because of its close relationship with vocabulary depth. Notably, the appearance of keywords like vocabulary teaching and statistic processing means that research on

vocabulary expanded its domains to new strategies and techniques and caught up with the development of society.
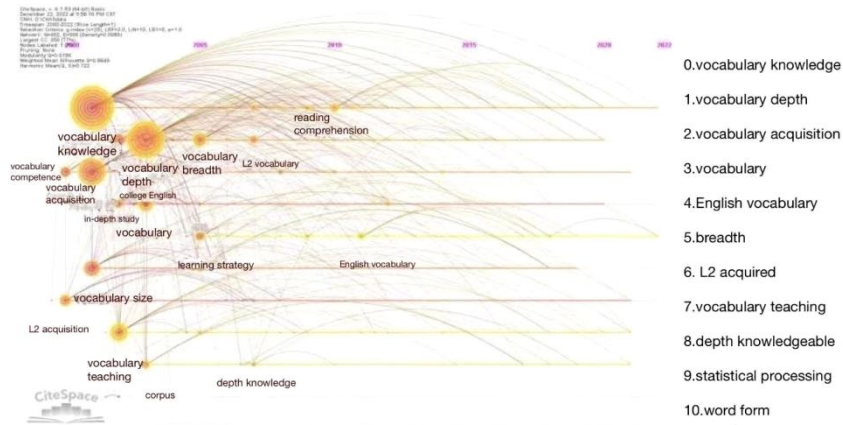

Figure 3. Timeline of vocabulary knowledge

3.3.2 Burst analysis

The scientific map of burst generated by CiteSpace can represent the change of hotspot in a certain research field. Figure 4 clearly lists the bursts and their diachronic developments. It can be seen that Chinese scholars first associate vocabulary knowledge with English reading from 2003 to 2006 and the topic regained its popularity from 2012 to 2020. From 2012 to 2017, researchers also focused on the relationship between vocabulary knowledge and English writing, but the time did not last longer than English. Similar to Figure 2, Figure 3 also demonstrates that studies on vocabulary breadth stated earlier at the year of 2006 and gained attention again at the year of 2011 accompanying the appearance of vocabulary depth, but it is vocabulary depth that becomes a new hotspot in this area in recent years between 2018 to 2022. The other significant bursts are corpus and vocabulary teaching which are new research topics and reveal the possibility of exploring vocabulary knowledge from new perspectives and with new techniques.
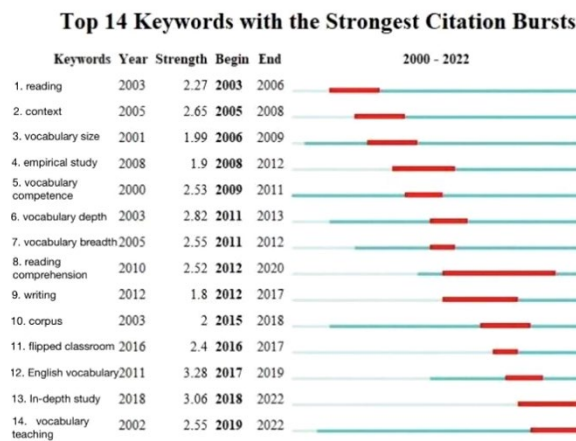

Figure 4. Bursts of vocabulary knowledge

3.4 Fronts of vocabulary knowledge

Through the discussion of the development trends and hotspots of domestic research on English vocabulary knowledge, it can be seen that in the past thirty years Chinese scholars have made significant achievements in this research field. Although data shows that the research topic is receiving less and less attention in recent years, it still deserves researchers' investigation since many aspects are not fully explored. Researchers at home should conduct in-depth studies or expand the scope of this research area so as to promote new findings and even another booming time of research on vocabulary knowledge. In light of this above, four possible fronts of domestic research on English vocabulary have been concluded as follows:

Firstly, increasing the components of English vocabulary knowledge simultaneously examined in research. Vocabulary knowledge can be divided into vocabulary breadth and vocabulary depth or into form, meaning and function, with two sub-categories: receptive knowledge and productive knowledge. Concerning the first framework, many researchers have explored the two components both respectively and simultaneously. However, as for the second framework, most researchers have examined either single component or two components, almost focusing on form-meaning relationship of word. As it has been generally accepted that vocabulary learning is a developmental continuum, more components of vocabulary knowledge should be taken into consideration so as to form an overall understanding of this complex system.

Secondly, exploring standard measurements of English vocabulary knowledge. Considering various participants, contexts and even vocabulary knowledge components involved, different tests are designed to measure vocabulary knowledge. Without a set of standard criteria, results of relevant studies are less connected and comparable, Meanwhile, the lack of standard tests for vocabulary knowledge might lead to the problem discussed above since too much time and energy spending on the design of various tests stop their attempts to investigate more vocabulary knowledge components. Hence, more efforts should be given to the exploration of standard measurement of English vocabulary knowledge so as to make studies easier to conduct and results from different studies more comparable.

Thirdly, diversifying the participants involved in research. Most domestic studies on English vocabulary focus on examining the vocabulary knowledge of college students while students from primary school and high school are less involved. Though recently studies on teaching strategies and vocabulary knowledge are generally conducted in English classroom of primary school, it is still a small proportion compared with studies in higher education. Therefore, research should diversify the scope of participants and investigate the characteristics of participants' vocabulary knowledge with different proficiency level so as to further examine the developmental process of acquiring vocabulary knowledge.

Finally, expanding the connection of English vocabulary knowledge with other research areas. Most domestic studies on English vocabulary knowledge limit their scope within the construct of vocabulary knowledge, like vocabulary breadth, vocabulary depth and vocabulary acquisition, but few studies innovatively connect vocabulary knowledge with other research topics. Though teaching strategies like flipping classroom and engineering techniques like corpus and e-dictionary have recently emerged as new domains to be connected with vocabulary knowledge, they have not grained enough attention to be popular trends. Thus, domestic researchers should innovatively expand the explorable scope of English vocabulary knowledge and take the localized features of Chinese learning contexts into consideration to form unique research topics.

4. Conclusion

The present study collects literature published on CNKI from 2000 to 2022 and demonstrates the development trends and hotspots of domestic research on English vocabulary knowledge with visualized scientific knowledge maps generated by CiteSpace. Results show that domestic research on English vocabulary knowledge presented the trend of rapid growth in the first decade of the 21th century, but it gradually lost the favor of researchers in the 2010s and this trend seems to be going on in recent years. However, through further analysis of the content of research, it can be observed that most existing studies focus on exploring clusters like vocabulary breadth, vocabulary depth, vocabulary acquisition etc. Even within these limited research topics, there still exist some gaps little explored. The limited research topics and incomprehensive exploration in specific field result in the retardation of domestic research on English vocabulary knowledge.

In this regard, it is an urgency to fulfill the gaps in this area and promote its further development. According to the analysis above, the study proposes four possible fronts in this area in order to provide references for future research. It is advisable for future studies to examine multiples components of vocabulary knowledge simultaneously, explore the standard criteria for measurement of vocabulary knowledge, investigate the vocabulary knowledge of learners with various proficiency level, and expand the research scope of vocabulary knowledge by connecting it with new research topics.

Although this study is carefully designed, there are some limitations that should be addressed. In this study, 647 Chinese articles themed by "English vocabulary knowledge" and published in the database of CNKI from 2000 and 2022 are collected and some of them are excluded for reason of being mismatched or little relevant. First, there is only one keyword for searching so some relevant literature might be neglected. Second, the data is only derived from the database of CNKI, although CNKI has been

recognized as one of the most popular databases of research studies, it is inevitable that the data collected is incomprehensive. the exclusion of irrelevant studies is all done by the author herself with hand screening, so similarly the perfect screening of relevant studies cannot be guaranteed.

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