Proceedings of the 2nd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7048/28/20231244

Review of Research on EFL Learners' Mental Lexicon

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Abstract: Research on the second language (L2) mental lexicon has become popular since this century, under the influence of literature on the first language (L1) mental lexicon. Among various L2, English is one of the most commonly learned second languages by non-native speakers all over the world. This paper reviews literature about major findings of English as a foreign language (EFL) learners' mental lexicon through the results of word association tests, analyzed from three perspectives: syntagmatic responses, paradigmatic responses and form responses. Also, this paper summarizes some influencing factors of the results from empirical studies. By reading previous research on EFL learners' mental lexicon, this paper tries to find out some pedagogical implications to help improve the efficiency of L2 vocabulary teaching. The findings of empirical studies show that EFL learners' mental lexicon is quite different from native speakers. Although both groups' mental lexicon is mainly associated with semantic responses, the specific links are distinct from each other. EFL learners are more likely to give form-related responses, but whether the proportion of syntagmatic or paradigmatic responses is higher varies in different experiments.

Keywords: EFL, L2 mental lexicon, word association

1. Introduction

A vast body of literature on the second language (L2) mental lexicon has accumulated since 1950s, when some researchers began to compare the similarities and differences between L1 and L2 speakers' mental lexicon [1]. In fact, as early as 1968, Weinreich proposed coexistence and merging of difference language systems [2]. He argued that due to different ways of articulation, it would be more likely that bilinguals kept the mental lexicon separately [2]. However, he also thought it possible that part of mental lexicon may be merged rather than coexistent separately, which then needed more investigation to prove [2]. Mental lexicon stems from psycholinguistics, which refers to the lexical representation of L2 knowledge stored in mind. Wolter argued that L2 mental lexicon organizes in a very different way from L1 mental lexicon [3]. To be more specific, Meara argued that semantic association produced by learners tend to be distinct systematically from that of native speakers [4]. The organizational pattern of mental lexicon is one of the important aspects of vocabulary ability and can show EFL learners' L2 vocabulary acquisition stage, as proposed by Jiang [5]. This review paper aims to teases out the structure and variables of EFL learners' mental lexicon through previous empirical research, thus offering some pedagogical implications. Since mental lexicon cannot be observed directly, researchers adopt various approaches to explore the organization of mental lexicon, among which word association tests are commonly used. Participants of word association tests are

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asked to give their responses after listening or looking at a word (stimulus) presented. This review paper is to summarize the major findings of EFL learners' mental lexicon from the results of word association tests. Another method used for plumbing the structure of the mental lexicon is priming. Meyer and Schvaneveldt argued that if words are connected to other words previously encountered by learners, they are more quickly recognized [6]. For example, the word "nose" is likely to be recognized more quickly after the word "eye" than other unrelated words. So the word eye can be said to prime the target word nose.

2. Major Findings from Word Association Responses

Word association responses are often classified into three categories: syntagmatic responses (or collocational responses), paradigmatic responses, and form responses. Syntagmatic responses are words that differ from the stimuli in the syntactic category and frequently appear in the same sentence context as the stimuli, such as beautiful-girl, while paradigmatic responses are words that share the same part of speech or semantic category as the stimuli, such as eye-nose. Form responses, as clearly seen from their names, refer to responses that rely heavily on the form of words, ignoring the meaning [7]. Both syntagmatic and paradigmatic responses are semantic responses.

2.1. Semantic-connected or Form-related Mental Lexicon

There have been disputes about whether the L2 mental lexicon is connected semantically, or form related. Zhang classified responses other than semantic response as non-semantic responses, including words that have connections in phonology or similar in spelling, which are form responses and other words that is derived from the stimuli or cannot have a recognizable association with the stimuli [8]. In her findings, only 60.3% of the EFL learners' responses are semantic representations, which is much lower than the native English speakers, with semantic responses at 86.9% [8]. Even though, the result may still be a little higher for semantic responses because she put the semantic association in priority when the response is both semantically related and form-related. What's more, her study presents that there is an increase in semantic responses with higher English proficiency. Jiang and Zhang were more cautious when selecting stimulus words and making the standards for classification [9]. The stimuli they chose are both semantically connected and orthographically similar. That is to say, the stimuli did not unfairly influence the participants' types of responses. Form responses were defined in a quantified way: one that overlapped with the stimulus word for 67% of its letters or phonemes. Their findings are similar to Zhang's: although both native speakers and non-native speakers' responses were predominantly semantic, non-native speakers apparently produced more form responses than native speakers [8]. Moreover, there is a negative correlation between participants' familiarity, lexical frequency of the stimuli and the number of form responses [9]. This relationship between the three factors also complies with that of Zhang's since higher L2 proficiency usually means participants are more familiar with less frequent words.

2.2. No Consensus about the Most Frequent Response Type

Findings from previous studies were inconsistent regarding whether the proportion of the syntagmatic or paradigmatic responses is higher. Meara drew the conclusion that L2 learners were more likely to produce phonological responses and collocational responses, instead of paradigmatic responses, just like the behavior of L1 children [1]. Since L2 learners had smaller vocabulary compared with L1 speakers, the responses by them were less stable and some words could not be classified because sometimes they were mistaken for other words. Nevertheless, the results are challenged by other researchers. Singleton thought that the stimuli Meara had selected were of low frequency, and the participants' level of L2 were relatively low [10]. As a result, the participants might just not know

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the words, let alone connecting the stimulus with other words. According to Cui and Liu, all of their four groups of participants were English majors then on campus from four grades [11]. Their findings seem to agree with Singleton's argument [10]. The most frequent classification of response is paradigmatic response for all the participants. As a result, just like native speakers, students can produce paradigmatic association with words of high frequency [3]. Xie paid attention to distinguish proficiency levels of two different groups [12]. One group of participants were freshmen who majored in English and another group were postgraduate students who had already achieved the certificate of TEM 8. From Xie's paper we can see that the higher proportions of both paradigmatic and syntagmatic responses show the development of EFL learners' mental lexicon, as suggested by Nissen and Henriksen [13]. To be more specific, the proportion of paradigmatic responses produced by advanced students of English is more than twice as high as that of elementary students: 24.2% of elementary group and 52.4% of advanced group [12].

3. Influencing Factors

Due to the different results from previous studies, some researchers paid attention to the influencing factors of learner's mental lexicon, among which individual differences, EFL learners' mother tongue and selection of words used for investigation play an important role.

3.1. Individual Differences

In 1968, Weinreich argued that the arrangement of the L2 lexicon depended on the learner's experience with the L2. Just as what have been mentioned before, Soderman investigated learners of different stages of their English learning experience and found that paradigmatic responses were more frequent as learners' proficiency is higher, with form responses diminishing [14]. He argued that every word would go through different stages in mental lexicon, so its developing trace cannot avoid the influence of overall language proficiency [14]. Piper and Leicester compared three groups' work association results: a group of native speakers, a group of advanced Japanese EFL learners, and a group of Japanese novice learners [15]. A substantial distinction was found in the mean proportion of paradigmatic responses. Advanced learners produced more paradigmatic responses than novice learners, while L1 speakers produced more than advanced learners. The results of these studies provide some evidence that the development of mental lexicon of EFL learners may be similar with that of native children. Palermo compared different ages of native speaker children and found that a higher percentage of paradigmatic responses was given as children are older [16]. That is to say, the shift from syntagmatic to paradigmatic responses indicate the development of the level of L2. Nevertheless, Wolter pointed out that the higher proportion of paradigmatic responses may be the result of bigger vocabulary size, which could provide more selections for participants, thus synonyms in the same part of speech are the first choice [3]. And consequently, it was not indicative of development of the mental lexicon, but such argument is not the popular one. Agustin-Llach focused on the effect of age and proficiency on 196 EFL learner of two different school grades, using a lexical availability task to collect data [17]. During the task, the participants were asked to write as many as words or collocations that came to their mind after presented five prompts. The results showed that more tokens, more types and larger extent of heterogeneity and dispersion were produced by older and more skilled students. However, although the researcher stressed age as a factor of vital importance in the paper, it was singled out. The differences between his participants were more about proficiency instead of age, because they were still students and had a varied exposure to English, which increases with the years of their continuing study. When it comes to age, Jiménez et al. found an interesting fact: younger students used innovative word invention tactics, whereas older students used cognates more frequently [18].

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3.2. Mother Tongue

According to Channell, it is very possible that vocabulary in a speaker's L1 and L2 mental lexicon have robust connections to one another [19]. Cangir and Durrant discovered proof of cross-linguistic collocational priming in L1 Turkish EFL learners, especially for ADJ + N collocations [20]. Additionally, they also claimed that certain word combinations were digested more quickly when they were presented in the direction of L1 to L2, as well as when they were congruent across the two languages under study [20]. However, the processing of V + N collocations was inhibited between two languages [20]. This also proved the influence of L1 to the mental lexicon of L2, because the grammatical order of verb phrase in the two languages is different, V + N in English while N + V in Turkish.

3.3. Selection of Words

Wolter argued that a lot of literature collected data from word association tests using very common words, which would result in quite predictable results [3]. The frequency of words functions in a similar way as L2 proficiency, since the more skilled an EFL learner is, the more familiar with the word to him, thus increasing the frequency of some words in his mental lexicon, despite that the frequency of the words is actually lower than those usually used. As mentioned above, EFL learners also produce a large quantity of semantic responses. However, the pattern of responses has been considerably different in a few instances where lower frequency terms have been used as prompt words, leading to what may be categorized as a significant number of "childlike" or even "non-nativelike" responses [21, 22]. Wolter did not only use frequent words in his study. Instead, he focused on choosing words of various frequencies and then classified them according to the vocabulary knowledge scale (VKS) given by participants, which can present their depth of knowledge of a particular word [3]. His study evidenced that there was no statistical difference in the types of responses in VKS categories between native speakers and EFL learners. That is to say, depth of vocabulary knowledge is of vital importance in determining responses produced by participants.

4. Conclusion

The results of the empirical study show that EFL learners' mental lexicon is predominantly semantic-related, just like that of L1 mental lexicon, though they produce a much lower proportion of semantic responses compared with native speakers. However, there is an increase in semantic responses with their higher proficiency. Within semantic responses, whether the proportion of syntagmatic or paradigmatic responses is higher doesn't have an agreement, which is due to various influencing factors of EFL learners' mental lexicon. Nevertheless, it is certain that EFL participants tend to give more form-related responses.

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