

# Analysis of Fossilization Process of the Second Language Vocabulary from the Perspective of Memetics

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**Abstract**—Vocabulary acquisition is important in the second language acquisition research. Research shows that the fossilization of the second language exists generally. From the perspective of Memetics and according to the reason and process from different stages of the second language acquisition, this study helps learners to know vocabulary petrochemical causes and process more clearly, which can achieve better preventive action and improve learners' learning efficiency.

**Index Terms**—memetics, the second language vocabulary, fossilization process

## I. INTRODUCTION

When students learn second language, they usually have some language problems. For example, pronunciation with a strong accent, nasal /n/ and side sound /l/. These linguistic phenomena, which persist in learners' interlanguage for a long time and are difficult to change, are described as fossilization. The concept of fossilization was first proposed by Selinker in 1972 for characterizing lack of grammatical development in second language learning. It is widely accepted as a key contribution of second language acquisition (SLA).

Based on the abundant studies on second language fossilization, the errors of fossilization can be categorized into phonological fossilization, lexical fossilization, syntactic fossilization and pragmatic fossilization. In this thesis, lexical fossilization will be explored among English majors' oral English. Second Language vocabulary acquisition plays an important role in second language acquisition. Generally speaking, in the process of second language learning, with the improvement of the language level of second language learners and the increase of learners' vocabulary, the vocabulary ability of learners should also be improved. However, the researchers found that the vocabulary ability of middle and senior second language learners developed to a certain extent slowly or stagnated, the emergence of vocabulary acquisition plateau (lexical acquisition plateau), that is, lexical fossilization.

There are several reasons why Chinese learners produce lexical fossilization in the following aspects:

### A. Internal Causes

(1) The influence of the theory of "language acquisition mechanism".

"Language acquisition mechanism," theorists believe that there is a mechanism in the human brain that specializes in language acquisition. It can make the language knowledge of the external transmit through the ordinary grammar into the learners' language ability. But this acquisition mechanism naturally disappears in puberty. According to this statement, a person's transitional language after the age of 12 will be petrified before reaching the target language.

(2) Mother tongue transfer

Mother tongue migration is the transfer of language patterns or rules from the mother tongue to the application of the target language by foreign language learners, such as the word "chair" also means "chairman, speaker, university professor's position" and so on, and "chair" in Chinese does not have these meanings.

### B. External Causes

(1) The input quality of vocabulary learning is not high.

Krashen (1981) believes that learners must understand their existing level of language input with a slighter higher than they understood, that is after  $i+1$ , he can only be learned language.

(2) Impact of feedback

The feedback of teachers is not clear enough, the feedback itself is not informative and knowledgeable, and the learners' feedback to teachers is divided into understanding and cognition, which is not conducive to learners correcting mistakes.

(3) Lack of intrinsic motivation for foreign language learning.

China has always been based on examination-oriented education. Learners under the pressure of the examination language learning often appear to be more passive. Over time, students gradually developed a fixed way of thinking and expression, and eventually developed into a petrochemical language form.

## II. LITERATURE REVIEW

In this section, a review about the study on the lexical fossilization will be illustrated. The earliest study on lexical fossilization is reported in 1988, whereas Chinese study on lexical fossilization is much later.

The Hyltenstam (1988) study is the first case that dealt with lexical fossilization in the literature. His informants comprise 24 bilingual speakers: twelve in Finnish and Swedish and twelve in Spanish and Swedish, then twelve monolingual Swedish speakers serve as control group. All together, there are 36 informants. Both quantitative and qualitative analyses are taken. Quantitative measures like lexical density, lexical variation, and lexical sophistication are used to estimate lexical characteristic and quantitative measures like, lexical error analysis is used. In addition, the results show that as for the distribution of error types and the frequency of errors there are significant differences between the bilingual speakers and monolingual speakers. Thereby Hyltenstam draws the conclusion that the results have some bearing on fossilization.

According to Laufer's (1998) one-year study, she finds that Israel High School students' receptive vocabulary and controllable productive vocabulary developed very rapidly. However, their productive vocabulary does not increase at all. Moreover, the proportion of using low-frequency word is quite low in the written English and the complexity of vocabulary does not have an obvious progression as expected. Thus, she examines that the vocabulary plateau exist during the learning process of productive vocabulary. Paula Jullian (2000) has got the same conclusion. Based on her study of Spain High School English learners, she finds lexical acquisition plateau also happened among these students.

Many Chinese experts' researches have also proved that the vocabulary will fossilize among Chinese English learners. Zhou Dajun and Wen Boyan(2000) have a four-year investigation, especially investigate the polytechnic learner's vocabulary. The result is that the vocabulary size increase fast in the first two years of college study, while for the later two years it stops increasing. Thus, the vocabulary size of the graduate is just equal to the size that they have learnt in the first year.

Liu Shaolong's (2001) research presents that the growth of vocabulary depth and that of breadth are not even. The acquisition of vocabulary breadth develops much faster that of the vocabulary depth. With the slow growth of vocabulary depth acquisition, the plateau phenomenon appeared.

Zhang Shujing (2003) investigates the English vocabulary reaction for part of the Chinese students. The results prove that many subjects do not have exact understanding of the words, and compared with the native speakers, their vocabulary knowledge still has a long way to go. Moreover, there is systemic gap between the second language psychological words and first language psychological words. It shows that the vocabulary knowledge structure of second language learner has problems, and quite amount of semantic relations have not been completely established between the first and second language, and cannot be regarded as fully acquired. This is just the strong evidence of what has been mentioned in the previous part, Jiang's (2000) psychological analysis of lexical fossilization theory.

From the colligation and collocation perspective, Pu Jianzhong (2003) makes a research on the Chinese learner corpus and notices that the depth level of vocabulary among Chinese L2 learners is still at a low status. The authenticity and accuracy of vocabulary use are far from the standard level.

Cui Yanyang and Wang Tongshun's study (2006) shows that during the research on the vocabulary process, there is no significant difference between the freshman and sophomore students, and between the junior and senior students. Yet there is obvious difference between the sophomore and junior student. Hence, they think that the lexical fossilization would happen twice, within the first two years and the last two years.

Wen Qiufang(2006) has undertaken a follow-up survey of Chinese English majors' vocabulary changes in oral English. Through the analysis of speaking fluency, vocabulary's diversity and the breadth of vocabulary frequency, she summarizes that the second and third year in college are the prime time for English majors' vocabulary growth. It also proves the fossilization phenomenon does exist in the spoken language among Chinese English learners.

Yang Shideng (2007) reported a quantitative research on 125 English majors and got the conclusion that the productive vocabulary development under the L1 circumstances was different from that of the native speakers. The productive vocabulary does not grow linearly. Conversely, the development slows down year by year, which means that there is rapid growth in the first and second year. During the third and fourth year in college, the learning of productive vocabulary starts to fossilize. The senior stage of undergraduate study is a fossilized period for English majors.

## III. LEXICAL FOSSILIZATION AND MEMETICS

From the perspective of memetic, this paper analyzes different stages of the second language acquisition in detail and then gives some suggestions to prevent the lexical fossilization. It's able to improve learners' learning efficiency. However, we should have some basic knowledge about lexical fossilization and memetics.

### A. *Lexical Fossilization*

The concept of fossilization was first proposed by Larry Selinker, a famous American linguist, in *Interlanguage* (1972). Since then, linguistic circles, especially psycholinguistic circles, have begun to study fossilization. The *Longman Dictionary of Language Teaching and Applied Linguistics* defines "fossilization" as "fossilization is a occurring process in the process of second language or foreign language learning, that is, incorrect linguistic features become a permanent or stable way of speaking or writing a language." In second or foreign language learning,

fossilization occurs at all levels of pronunciation, vocabulary and grammar. For example, fossilization of pronunciation characteristics is the cause of learners' foreign accent.

Vocabulary learning plays an important role in the whole second language acquisition. Academics generally believe that learners have a process of transforming receptive vocabulary into productive vocabulary in the process of improving their language level and vocabulary size. However, foreign language learners have more receptive vocabulary than productive vocabulary in quantity. However, the study finds that the vocabulary switching of language learners is not entirely the case. In the initial stage of foreign language learning, the acceptance of vocabulary is proportional to the output, while in the higher stage, the acceptance vocabulary can generally grow faster, but the productive vocabulary is not on the rise, but a relatively stable stagnation. The experimental studies of Wu Xudong and Chen Xiaoqing (2000) and Laufer (1998) also fully prove this point. This shows that fossilization of productive vocabulary competence exists in foreign language learning, and it is also a common problem in the development of foreign language learners' vocabulary competence.

Therefore, this paper will analyze the causes and processes of fossilization of vocabulary in second language acquisition from the perspective of Memetics and according to the different stages of memes, aiming at helping learners understand the causes and processes of fossilization of vocabulary more clearly, so as to achieve better preventive effect, reduce fossilization area and improve learners' learning efficiency.

### B. Memetics

Memetics is the study of information and culture based on an analogy with Darwinian evolution, exploring the concepts and transmission of memes in terms of an evolutionary model. Proponents describe memetics as an approach to evolutionary models of cultural information transfer. Critics regard memetics as a pseudoscience. Memetics describes how an idea can propagate successfully, but doesn't necessarily imply a concept is factual. The term meme was coined in Richard Dawkins' 1976 book *The Selfish Gene*, but Dawkins later distanced himself from the resulting field of study. Analogous to a gene, the meme was conceived as a "unit of culture" (an idea, belief, pattern of behaviour, etc.) which is "hosted" in the minds of one or more individuals, and which can reproduce itself in the sense of jumping from the mind of one person to the mind of another. Thus what would otherwise be regarded as one individual influencing another to adopt a belief is seen as an idea-replicator reproducing itself in a new host. As with genetics, particularly under a Dawkinsian interpretation, a meme's success may be due to its contribution to the effectiveness of its host. Memes are transmitted through the human brain and are "a form of information that exists in one person's memory and can be copied into another's memory". (Susan Blackmoor, 1999). The two main elements of meme are imitation and creation. Memes can exist as long as they are within the reach of people's consciousness and thinking. Memes do not spread as accurately as genes do. They change according to people's living habits and cultural differences. Blackmoor pointed out: "There is a huge selection pressure in the evolution of memes, so there are not many potential memes that can survive. Only a few memes can be successfully copied from one person's brain to another brain, from one person's brain to print, or from one person's voice. The memes we encounter in our lives are usually successful memes, that is, the ones that win in the competition for self-replication. These winning memes are called strong memes." (Blackmoor, 1999)

There are four steps of successful replication of memes: assimilation, memory, expression and transmission. In the assimilation stage, effective memes should have the ability to "sensitize" receptors and be noticed, contacted, understood and received by receptors. During the memory stage, memes can stay in the receptor's mind. In the stage of expression, receptor's memory memes can be externalized into physical shapes: text, pictures, behavior, story and so on. Memes in the stage of transmission have strong stability. They can be transmitted through books, photographs, artifacts, CD and other physical carriers to ensure that information does not lose and deform.

## IV. ANALYSIS OF LEXICAL FOSSILIZATION FROM THE PERSPECTIVE OF MEMETICS

From the perspective of Memetics and according to the different stages of memes, this paper analyses the causes and processes of fossilization of vocabulary in second language acquisition, which can help learners understand the causes and processes of fossilization of vocabulary more clearly, and reduce fossilization, then improve learners' learning efficiency.

### A. Assimilation Stage

For domestic second language learners, vocabulary learning is seemed as a key to learn language. Of course, in the process of recognizing English vocabulary, there are also some interesting words according to learners' purposes and interests. For some students who have just come into contact with English, they would like to know how to express some things around them in English. Some naughty students often ask their English teacher how to say "I love you" and "I miss you" in English. Some students ask "cat" and "dog". It is obvious that pupils are interested in words like "miss, cat and dog". English learners of different grades have a certain interest in learning some different words. When they encounter the words they are interested in, they pay more attention to the words than other words. At the same time, they remember the words faster than other words. For most English learners, there exists the phenomenon of assimilation in their vocabulary learning. In the assimilation stage, fossilized vocabulary memory begins, and learners have a special fondness for the Chinese meaning of some words which are close to their own life. For example, when

learners see the words “hell” (shell, frame, surface, character, appearance), “lick” (lick, defeat, overcome, wave, tap, roll), they will be more impressed by the meaning of “shell” “lick” than other meanings.

### *B. Memory Stage*

The lexical fossilization can be seen in Memory stage initially. When English learners memorize vocabulary, they usually memorize it according to their mother tongue system, which will form a “gap” and have certain limitations on the memory of English vocabulary. Everyone has different cultural backgrounds, living environment, living habits and so on. These factors are the main reasons for this “gap”. For example: the word “envy” means “envy” and “jealousy” in English, but “envy” and “jealousy” are antonyms in Chinese.

There are certain limitations on the memory of English vocabulary. Some words in English contain too many meanings, and if they are understood by their own native language system, there is no connection between them, which will cause memory impairment. For example, “volume” means three meaning in English, but in our mother tongue system, these three meanings are incompatible. It’s more difficult to remember it.

In the process of memory, if learners do not fully grasp their mother tongue, especially for some suspected similar words in their mother tongue, they can not fully understand and distinguish the main differences between them, which will lead to the difficulty of distinguishing English vocabulary. For example, when people need to express the meaning of “rabbit”, most people think of “rabbit”, but seldom think of “hare”.

Due to the inadequate understanding of English vocabulary, including English and American words with the same national meaning but different writing forms, it can also lead to memory deficiencies, such as the Chinese meaning of “corn” in English vocabulary for “corn” (American English) and “maize” (British English).

In addition, the imperfect compilation of textbooks is also a major reason. In the textbooks of elementary and junior middle schools, there are many words with multiple meanings that often give only part of the meaning. The learners’ memory of these words will only stay on that part of the meaning.

All these factors have certain hindrances to English vocabulary learning and greatly deepen the fossilization of vocabulary.

### *C. Expression Stage*

The expression stage is the embodiment of fossilization. Expressions mainly refer to learners’ oral and written expressions, sometimes reflected in reading comprehension. Due to the fossilization of learners’ memory in the memory stage, learners maintain incomplete memory and understanding of vocabulary. When they express their Chinese meanings in English, it is difficult for them remember the words that have fossilized English words in their brains. Similarly, in reading comprehension, when learners encounter words they know and interpret the original text according to them, it is always difficult to understand the wishes and feelings expressed by the author, because their memory of the word has been fossilized. The meaning expressed by the author is not what the learner remembers, but may be another meaning of the word, and the meaning is just right. It’s something that learners don't remember. For example, “fry” in Chinese means “fry”, “fry”, “fish seedlings”, “fish seedlings”, “small animals living together in groups”; “egg” in Chinese means “eggs”, “eggs”, “encouragement”, “incitement” “fan” in Chinese means “fanatics”, “fans”, “fans”, “fans” and “blowers”.

Faced with these words, learners often remember several meanings in front of them. In the stage of expression, especially when translating one's mother tongue into English, because of the fossilization of similar words, learners usually think of words that are easy to come into contact with in learning when they want to express a special and subtle emotion. This greatly limits the learners’ ability to express language and makes it difficult for them to express their feelings vividly and touchingly.

### *D. Transmission Stage*

Learners can express and transmit the language in transmission stage. The actors in this stage are mainly teachers and learners. In the normal teaching process, if teachers always use one meaning of a word to explain, fossilization of the word will gradually form in the students’ brain of course. If teachers always use their mother tongue to translate English, and do not interpret and distinguish their mother tongue from many kinds of English, learners’ vocabulary acquisition will be fossilized. In classroom interactive learning, some learners use words whose meanings have been fossilized to express their emotions, which can lead other learners to accentuate the fossilization of the words unconsciously.

## V. STRATEGIES TO REDUCE FOSSILIZATION OF SECOND LANGUAGE VOCABULARY

We have analyzed the causes of lexical fossilization from the perspective of Memetics in detail, and here are some suggestions to lexical fossilization.

### *A. Rebuilding Cognitive Concepts in Second Language Vocabulary Acquisition*

Nation (2001) holds that “knowing a word” means that learners must understand the morphology of the target word, the syntactic restrictions and collocations of the word, the pragmatic functions of the word and the meanings of many words, including spelling, pronunciation, syntax, word frequency, collocation, the restrictions on the use of the word and the distinction between receptive knowledge and productive knowledge of the target word. Richards (1976)

proposed that vocabulary competence includes eight aspects: (1) Native speakers' grammatical competence will be relatively stable and change little in adulthood, but their vocabulary knowledge will continue to expand; (2) knowing a word means knowing the frequency of its occurrence in written or spoken language and often using it together with other words; (3) Clearly knowing that the use of the word is limited by its functions and occasions; (4) the syntactic behavior of the word; (5) the root of the word and derivative forms; (6) the semantic connection network between the word and other words; (7) the semantic value of the word; (8) the different meanings of the word. Therefore, in assimilating and memorizing second language vocabulary, we should not simply memorize the pronunciation, spelling and translation of a word, but pay attention to the development of vocabulary knowledge, comprehensively understand the content of vocabulary knowledge and rebuild the cognitive concept of second language vocabulary acquisition.

#### B. Making Full Use of Semantic Fields to Reduce Fossilization of Second Language Vocabulary

In linguistics, a semantic field is a group of words with related meanings. The words in a semantic field are usually part of a category, such as weather words or animal words. Linguistics generally agree that any given language has a finite number of semantic fields and sub-fields. For example, words like "aluminum", "iron", "nickel", "silver", "copper", "lead", "tin", and "gold" refer to a common concept "metal" and they are closely related in meaning. So they belong to the same semantic field. That is to say, in order to determine the meaning of a word, we must first compare the relationship between other words in the same semantic field and the position of the word in the semantic field (Wu Qiang, 1988). When we acquire second language vocabulary, we put vocabulary into the semantic field to memorize, express and disseminate, and improve productive vocabulary by contacting a large number of meanings and collocations in the semantic field.

### VI. CONCLUSION

Successful replication of memes generally goes through four stages: assimilation, memory, expression and dissemination. In assimilation stage, effective memes are noticed, touched, understood and received by the recipients, in memory stage, in expression stage, memes are externalized into perceptible physical shapes, such as language, text, pictures, behavior, etc. Memes in communication stage have strong stability, ensuring that information is not lost and deformed.

Through a detailed analysis of the four stages of successful meme replication, this paper has proposed two strategies to effectively prevent lexical fossilization: Rebuilding cognitive concepts in second language vocabulary acquisition and making full use of semantic fields to reduce fossilization of second language vocabulary. It will help learners to understand the causes and processes of fossilization of vocabulary more clearly, so as to reduce lexical fossilization area and improve learners' learning efficiency.

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Gao holds that it's her duty to make a contribution to second language acquisition.