A Study on College English Vocabulary Teaching from the Perspective of Category Theory

Xinglong Wang[1,2,a,*], Yueqi Zhang[2,b]

[1]School of Foreign Languages, Chongqing Jiaotong University, Chongqing

[2]College of International Studies, Southwest University, Chongqing

[a] xlwang@cqjtu.edu.cn , [b] yueqizhang2021@126.com

*corresponding author

Abstract: The English Language is mainly composed of vocabulary, pronunciation and grammar, and among them, vocabulary is the most crucial component. At college, enlarging students' English vocabulary is all the way an important and tough job for English teachers. A large vocabulary positively promotes students' ability in English acquisition. Teachers need find out an effective approach as a solution to students' disabilities in vocabulary learning so as to efficiently expand the quantity and raise the quality, of their vocabulary. Multiple researchers believe that it is necessary to explore the inner relationship between cognition and language learning from the perspective of category theory, and apply the theory of cognitive linguistics to vocabulary teaching and learning. This paper attempts from the viewpoint of category theory to help English teachers to improve students' cognition of English vocabulary at college. It aims at accumulating experience from category theory, arousing students' interest as well as improving English vocabulary teaching.

1. Introduction

As vocabulary is the carrier of knowledge on history, culture, customs, etc., the importance of enlarging English vocabulary is self-evident to both teachers and students at college. Wilkins (1972: 111) said that, without grammar, very little can be conveyed, without vocabulary, nothing can be conveyed. Wallance (1982) believed that learning a foreign language is basically a matter of learning the vocabulary of that language.

In China, learning English is not only a way to absorb advanced western technology but also a manner to spread Chinese culture and values to the outside world. So that is why the Chinese government set English as one of the main subjects in the nine-year compulsory education system even over 40 years ago. In accordance with this policy, Chinese students are supposed to learn and master 1,500 to 1,600 frequent words and phrases, gain the ability to express themselves fluently and get a good understanding of how to use the words and phrases after their high school study.

College English teaching targets cultivating students with English competence for effective communication in their daily life, study and so on. In addition, students are expected to comprehend what is relevant to their major and communicate effectively in a spoken or written form on a wide range of topics, of general or specific interest. When communicating with people with different cultures, students are hoped to cope with the differences in terms of culture and values and adopt appropriate communication strategies for different communication occasions or objects.

For the purpose of studying abroad, a lot of college students take a test like TOFEL or IELTS. They would rather spend much time in memorizing words which are not use-oriented but test-oriented. This results in a poor speaking or writing expressing competence. Liang (2002) agrues that teachers need attach importance to basic vocabulary teaching and combine polysemy with collocation. It is quite important to lay a solid foundation of basic knowledge before enlarging vocabulary.

As vocabulary is often the focus of second language learners, English vocabulary learning is an indispensable part of English acquisition and, in addition, it plays a key role in improving skills to use English. As an important part of English teaching at college, how to improve students' vocabulary comprehending and memorizing ability is a big problem, to which educators and researchers are expected to seek a solution. Categorization fortunately offers a way to facilitate vocabulary teaching.

2. Research Background

As the English language is a tool of expression and communication, vocabulary is a critical factor to determine whether or not smooth listening, speaking, reading, writing or translating can be achieved in time to follow. If vocabulary is inadequate, these competences will be unfortunately jeopardized to various extents.

With its development in the 1980s, cognitive linguistics put forward a new stand on the study of English teaching. In 2007, the College English Course Teaching Requirements issued by the Ministry of Education (hereinafter referred to as CECTR) set clear requirements on vocabulary teaching which are split into general requirements, higher requirements and much higher requirements. The general requirements for vocabulary is that students need master 4,795 words and 700 phrases, among which there are about 2,000 positive words. The higher requirements are to master 6,395 words and 1,200 phrases, among which there are 2,200 positive words. The much higher requirements are to master 7,675 words and 1,870 word groups, among which there are 2,360 positive words. Positive words frequently mentioned in these requirements refer to the vocabulary that students are able to skillfully use on the basis of cognition for expression in an oral or written manner. Therefore, in the whole process of English teaching, the importance of vocabulary teaching is known to all, and the clear requirements of vocabulary curriculum in CECTR indicate a right direction for teachers' teaching and students' learning as well.

At present, some teachers do not have got enthusiasm enough for college vocabulary teaching. They only give a brief explanation of the semantics of a word in the textbook, which can hardly make the word better understood. The meaning of a word is not a simple correspondence between form and meaning. To truly understand a word, one need know about its relevant background and understand its meaning in a specific context rather than simply memorize it. Language, as we know, is intended for use. Students should not only understand it but also master how to use it properly.

To change the current situation in vocabulary teaching, which is time-consuming and of low efficiency, it is imperative to apply a scientific theory to guide the practice. Properly speaking, this

paper tries to contribute to the study of the relationship between prototype theory and vocabulary teaching strategies so as to provide a helpful solution to English vocabulary teaching.

2.1 Category Theory at Home and Abroad

Category theory plays an irreplaceable part in the birth and growth of cognitive linguistics. In 1969, Berlin & Kay proposed focal colors and implication hierarchy of basic colors. The classification of focal colors can only be conceived as a mental process. This mental process of classification, whose complex nature will become clearer as we go on, is commonly called categorization, and its products are cognitive categories (Wen 2012).

According to Jackendoff (1985), categorization is the outcome of the juxtaposition of two conceptual structures. It is based on the ability to explain new experience which originates from what is previous experience. Ungerer & Schmid (2001) argued that categorization is a mental process of classification by human beings to classify things and objects. It is the basis on which to construct categories. According to Dirven & Verspoor (1998), categorization is the ability to perceive different things as samples of the same category. Five benefits from forming categories based on Stephen (1992) are listed as follow. First, categorizing objects "reduces the complexity of the environment". Second, categorizing is "the means by which objects of the world are identified". Third, the third achievement is a consequence of the two above: the establishment of categories "reduces the need for constant learning"; we do not have to be taught about novel objects if we can classify them; we can use our knowledge of items in the category to respond to the novel objects. Fourth, categorizing allows us to "decide what constitutes an appropriate action"; a person who eats wild mushrooms must be able to distinguish between poisonous and nonpoisonous varieties. Fifth, categorizing "enables us to order and relate classes of objects and events".

2.2 Research on Category Theory and Vocabulary Teaching

In the 21st century, Csábi (2008) argued that the multiple meanings of polysemous words are rational and transitional, not isolated Boers (2004) discussed how to cultivate learners' metaphorical awareness of expanding their vocabulary and have a good grasp of vocabulary. Some researchers studied vocabulary teaching from the perspective of category theory and point out the importance of basic level category vocabulary teaching. It's believed that a person's competence in categorization is crucial to the cultivation of his/her competence in vocabulary acquisition (Li & Sheng). Researchers believed that learners should start from the basic meaning of basic level category vocabulary, and gradually push forward to other words and meaning (Liao 2007).

Zhu (2005) suggested that English teachers should pay attention to the three respects of vocabulary teaching. In the first place, English teachers should attach much importance to the basic category of vocabulary because they are a solid basis of students' vocabulary learning. In the second place, English teachers should pay great attention to polysemy explanation and help students comprehend the intrinsic relationship between distinct meaning items and know how core meanings are extended to marginal meanings. In the third place, metonymy and metaphor awareness is the most important point in English vocabulary learning. Her ideas are more comprehensive than others. The category theory of cognitive linguistics is a methodological weapon to explore the category theory from the horizontal and vertical dimensions of vocabulary. The application of vocabulary teaching to English majors aims at building a bridge between category theory and vocabulary teaching so as to throw light upon vocabulary teaching and provide solutions to many problems existing in vocabulary teaching (Kuang 2010).

3. Theoretical Foundation

The concept of category has been long in existence. In Western academic history, the use of the terminology can be dated back to Aristotle in ancient Greece. Aristotle made a systematic discussion on categories in Categoriae, and he regarded categories as basic concepts derived from the analysis of different aspects of objective things.

Category is the subjective classification of cognitive objects based on the attributes of external things. For example, the classification of animals and plants, which are two large species in nature. Categorization is a psychological process during which people classify things through their own cognitive concepts. In the field of linguistics, categorization means that the process of naming and classifying languages, such as the study of lexical meaning, belongs to categorization.

Category and categorization are like twin brothers who accompany each other. The relationship between them is dialectical: categorization is a process of things' cognition, and category is a result of cognition. Category is a product as well as result of categorization, and it is a basic cognitive way for human beings to understand the world. Categorization is a base for the formation of category and concept. It is not only the central content of cognitive linguistics but also the jumping-off point of language use.

3.1 Classical Category Theory

Category theory has developed from Aristotle's classical approach to the prototypical category theory of cognitive linguistics. Classical category theory has been in wide existence for over 2,000 years. The theory believes that all the characteristics are binary. Meanwhile they have clear-cut boundaries. All the members in this category are equal and will not be divided into core or peripheral members. Aristotle believed that category is determined under necessary and sufficient conditions. He illustrated it by the definition of human: animals with feet. In order to prove the subject that Y is human, necessary and sufficient conditions must be available to show that Y has feet and Y is an animal. However, classical category theory cannot be applied to any categorization.

3.2 Prototype Category Theory

Berlin & Kay proposed the concept of Focal Colors in 1969. They thought that the 11 kinds of focal colors are named with some Basic English vocabularies and these colors are clearly distinguished. In the 1970s, American psychologists Rosch(1973) proposed prototype theory. It is put forward on the basis of Wittgenstein's family resemblance. Rosch thought that an entity need not possess all the features of a category to be one of its members. The central idea of prototype is that members of the same category have some common attributes. Members can be divided into central and marginal members under different circumstances. When they cannot give a certain definition of a category, people can often make it clear with prototype. For instance, in The Merriam-Webster Thesaurus job is defined as an assignment at which one regularly works for pay. And it provides a prototype like teacher and banker to help people understand. Prototype category theory is widely used in the study of second language vocabulary acquisition. In investigating the acquisition of English prepositions by Spanish speakers, Correa (1985) found that English prepositions closely related to the concept of Spanish prepositions are more acceptable to learners than other prepositions. Ma (2008) found that the difficulty of acquiring the core semantic members of prepositions is much lower than that of acquiring the intermediate and marginal semantic members after studying Chinese students' acquisition of the English prepositions of in, on and over.

3.3 Levels of Category Theory

The level of category can be extended to the upper and lower ends. Words in the upper category are more abstract and more general, while those in the lower category are more specific, and they are a collection of specific entities. Rosch (1976) divided categories into three levels: the superordinate level, the basic level and the subordinate level. The most important of the three levels, according to Corter & Gluck (1992), is the basic level because basic-level categories are most differentiated from one another.

Basic-level category occupies the most important place among the three levels. It is first learned by people in childhood and most frequently used in life. Moreover, it is quantitatively superior to the other two categories. Usually, basic-level category is expressed in short, simple, common and neutral words in verbal communication. In basic-level category, names tend to be simple in form and "primitive". In other words, they are not derived from other categories through the extension of metaphors.

Basic-level category vocabulary mainly refers to basic vocabulary of simple word form, strong word formation ability, few syllables, fast brain activation and easy learning. In general, basic-level category vocabulary has something in common: 1) its members have obvious external distinguishing features that can be perceived; 2) its complete perceived shape, external distinguishing feature and internal similarity reach the highest level of ideal balance; 3) it has the characteristics of rapid recognition; 4) it is a thing that is first recognized, named, mastered and memorized and first learned and understood by children; 5) the frequency of using the most concise neutral words is the highest; and, 6) it has the most important and fundamental level of knowledge organization. For instance, when we talk about flower, what first comes into our mind is rose, lily and jasmine. Rose, lily and jasmine belong to the subordinate level, and plant is the superordinate level of flower.

4. Vocabulary Teaching and Category Theory

4.1 Current Situation of College English Vocabulary Teaching

Current English vocabulary teaching at college is still mainly focused on word roots and affixes. Many teachers follow a word-list teaching strategy, and they only explain certain words. This teaching strategy is only suitable for English beginners. For college students, there are a large number of English words, and no obvious connection can be found between words in the word-list. Students often forget old words while memorizing new ones. Moreover, this teaching strategy is boring, which leads to students' reduced interest in word learning. Some teachers apply the strategy of contextual associative memory to vocabulary teaching. This teaching method is mainly to teach students how to guess the meaning of a new word according to the context, and then memorize it. In addition, there are some problems like a slow acquisition of vocabulary because students' understanding of vocabulary is realized in a contextual way. Meanwhile, this strategy brings more difficulties to students having a small vocabulary. Words acquired in this way can only be in memory for a shorter period of time. The semantic-processing teaching strategy turns to the use of charts or graphs so as to associate words. Though it can help students distinguish between words, this strategy is time-consuming and unable to facilitate students to enlarge their vocabulary in a short period of time. The effect of this method is not quite obvious for students having a small vocabulary. The textbook is an important resource as well as reference standard for English vocabulary teaching at college. Yet, many teachers unfortunately rely too much on the book without

much innovation or breakthrough, and that will only result in its less use.

4.2 Category Theory in College Vocabulary Teaching

According to Kuang (2010), prototype category theory and basic level of category theory are related to and distinguished from, each other. The former is related to the horizontal categorization, while the latter is related to the vertical categorization.

4.2.1 College Vocabulary Teaching Based on Prototype Category Theory

Prototype theory is mainly used in polysemy teaching. Polysemy, as a universal phenomenon in language, is one lexical form with two or more related meanings. At the beginning, every word is monosemous. With the development of human society, words are given new meanings. According to Zhang (2010), the change of word meaning scope, the conversion between praise and criticism on word meanings, and word meaning transfer are the three main methods of word meaning evolution. For example, light shares several explanations:

(1) n. the energy from the Sun, a flame or a lamp that allows you to see thing: The light is too poor to read by.

(2) v. to start to burn, or to make something start to burn: He light the candle.

(3) n. something that produces light, especially electric light, to help you to see: Turn on the lights, please.

(4) adj. a room that is light has plenty of light in it, especially from the sun: We like to study in a light room.

(5) adj. a light colour is pale and not dark: I prefer light colors.

(6) adj. not very heavy: The coat is light and warm.

(7) adj. easy to be understood: I took some light reading for the train journey.

In teaching process, teachers need attach importance to the core position of prototype meaning and give the key explanation before teaching other marginal meanings. Then teachers should elaborate on the relationship between polysemy so as to construct a semantic network. The inner relationship between different meanings will deepen students' cognition of words. Teachers should avoid explaining the meaning of words in isolation, but show students a coherent and complete semantic network of words.

Prototype theory points out that, among all the meanings of polysemy, there is a key meaning, which is the prototype of other meanings. The other meanings are derived from the key meaning through metaphors, metonymies and associations. Therefore, prototype categories are more easily accepted and mastered by learners, who expect teachers to pay attention to prototype vocabulary teaching, particularly polysemy teaching.
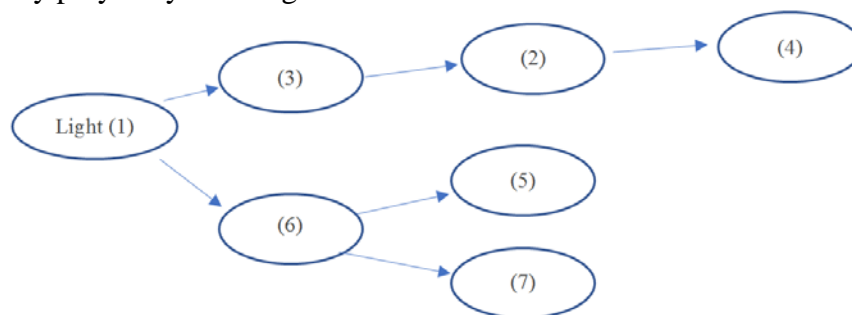

Figure 1: Topology of polysemy of "light"

On the basis of known knowledge, which means prototype, students' perception and understanding of a word gets improved. Teachers should start with the typical meaning of a word, deepen the typical meaning of the word with the help of collocation, association and other methods, strengthen its understanding, and then use cognition to explore the cognitive clues of polysyllabic meaning expansion to help learners build a semantic network of a polysemous word (Kuang 2010).

4.2.2 Vocabulary Teaching Based on Basic-Level Category

Teachers should emphasize basic category vocabulary. Croft & Cruse (2004) summarized the characteristics of basic level category in four points, the most inclusive level at which there are characteristic patterns of behavioral interaction; 2) the most inclusive level for which a clear visual image can be formed; 3) the most inclusive level at which part-whole information is represented; 4) the level used for everyday reference. Lu & Wang (1997) pointed out that in reading comprehension, if they master 1,000 basic words, students can understand 80% of normative articles; if they master 3,000 basic words, students can understand 93% of normative articles; if they master 4,000 basic vocabulary, students can understand 95% of normative articles, and if they master 5,000 basic words, students can understand 97% of normative articles. Teachers should pay attention to basic words corresponding with basic-level terms, which are of indispensable significance in everyday communication and should be placed in a salient position in vocabulary teaching.

Semantic aggregation and semantic segmentation are based on the theory of superordinate category and subordinate category. By aggregating certain English words that are similar in meaning, nature, characteristics, and categories, we can generalize the words into superordinate category. We can get hyponymy with smaller extensions and richer connotations by segmenting. For example in Figure 2, this way of memorizing makes the words look more reasonable, and they are closely related and clearly classified.
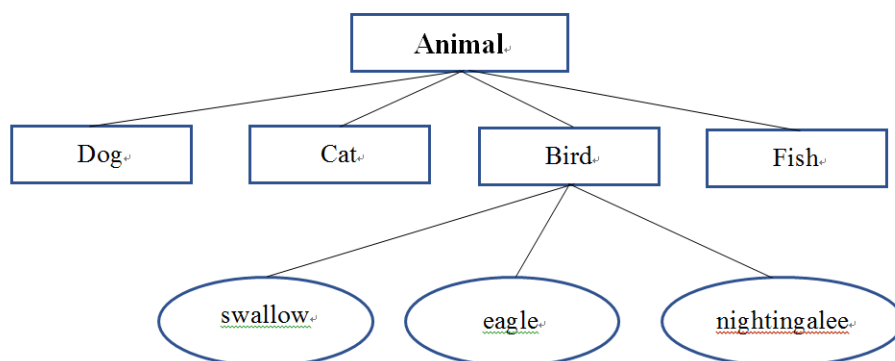

Figure 2: Hierarchy of the the meaning of "animal"

Category theory enriches the content of vocabulary teaching, helps students learn to categorize and organize vocabulary. Prototype category theory and basic-level category help students to deepen their understanding of English vocabulary from different perspectives so that they can learn words more concretely and effectively. So it has a positive effect on the expansion of word meaning.

5. Conclusion

Vocabulary teaching is one of the core tasks found in second language acquisition. With text explanation as their priority, some teachers concentrate their vocabulary teaching more on pronunciation and spelling. Most of them lack an awareness of applying cognitive linguistic theory to their teaching. It is no wonder that multiple students are tired of memorizing words. Even if they can spell all the words in the textbook, they cannot use them flexibly or at their will. Obviously, how to master English words and how to enlarge English vocabulary deserve the attention of teachers and students at college. Just as McCarthy put it, no matter how well students learn grammar, no matter how successfully the sounds of L2 are mastered, without words to express a wider range of meanings, communication in L2 just cannot happen in any meaningful way (McCarthy 1990). Effective vocabulary teaching and learning strategies will get students out of rote learning and repeated writing on paper to memorize word meanings. From a cognitive perspective, category theory is a potential approach to be applied to vocabulary teaching and learning.

This paper is focused on prototype theory on polysemy teaching and basic-level category on basic vocabulary teaching. A solid foundation of English vocabulary is the first step in English learning. Based on this, enlarging students' vocabulary will become a bit easier, more efficient and more rational. In addition, teachers should help students understand the inner relationship between different meanings of a word by paying attention to explaining polysemy. Apart from category theory, metaphors and metonymies can be applied to vocabulary teaching and learning.

Acknowledgments

References

[1] Berlin, B., & Kay, P. (1969). Basic color terms: Their universality and evolution. Berkeley: University of California Press.

[2] Boers, F. (2004). Expanding learners' vocabulary through metaphor awareness: What expansion, what learners, what vocabulary? In M. Achard & S. Niemeier(eds), Cognitive linguistics, second language acquisition, and foreign language teaching (pp. 211-232). Berlin: Mouton de Gruyter.

[3] Correa-Beningfield, M. R. (1985). Prototype and language transfer: The acquisition by native speakers of Spanish of four English prepositions of location. Doctoral dissertation, Teacher's College of Columbia University.

[4] Corter, J. E., & Gluck, M. A. (1992). Explaining basic categories: Feature predictability and information. Psychological Bulletin, 111(2), 291.

[5] Croft, W., & Cruse, D. A. (2004). Cognitive linguistics. Cambridge University Press.

[6] Csábi, S. (2004). A cognitive linguistic view of polysemy in English and its implications for teaching. In M. Achard & S. Niemeier(eds), Cognitive linguistics, second language acquisition, and foreign language teaching (pp. 233-256). Berlin: Mouton de Gruyter.

[7] Dirven, R., & M. Verspoor. (1998). Cognitive exploration of language and linguistics. Amsterdam: John Benjamins.

[8] Jackendoff, R. S. (1985). Semantic and cognition. Cambridge, MA: MIT Press

[9] McCarthy, M. (1990). Vocabulary. Oxford University Press.

[10] Rosch, E. (1973). Natural categories. Cognitive psychology, 4, 328-350.

[11] Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. (1976). Basic

objects in natural categories. Cognitive psychology, 8(3), 382-439.

[12] Stephen, K. R. (1992). Cognition: Theory and application. San Diego State University.

[13] Ungerer. F., & H. J. Schmid. (2001). An introduction to cognitive linguistics. Beijing: Foreign Language Teaching and Research Press.

[14] Wallace, M. (1982). Teaching vocabulary. London: Heinemann Educational Books.

[15] Wen, X. (2012). An introduction to linguistics. Beijing: Beijing Normal University Publishing House.

[16] Wilkins, D, A. (1972). Linguistics in language teaching. Cambridge: MIT Press

[17] Kuang, FANGtao, (2010). Vocabulary Teaching for English majors: An Exploration based on categorization Theory. Doctoral dissertation. Chongqing: Southwest University.

[18] Li Fang, Sheng ð^{a2}□, (2014), Lexical Semantic category development of Chinese-English bilingual children in The United States, Foreign Language Teaching and Research, (2), 246-2

[19] Liang, X.B., (2002), the implications of cognitive linguistics on English vocabulary teaching, Foreign Language and foreign Language Teaching, (2), 35-39.

[20] Liao, YAOyao, (2007), the application of categorization theory in English vocabulary teaching, Science and Education Literature Review, (10X), 113-113.

[21] Lu xiaojuan, wang Rongpei, (1997), a course of English lexicology, Shanghai: Shanghai Foreign Language education press.

[22] Ma Shuhong, (2008), A Contrastive Analysis of Spatial Categorization in English and Chinese: In, on and (in)...... On... Journal of Guizhou Normal University (Social Science Edition), (1), 132-136.

[23] Zhang shaoquan, (2010), A cognitive linguistics study of Chinese English Learners' Polysemy Acquisition, Chongqing: Chongqing University Press.

[24] Zhu, W. (2005), The implications of prototype category theory on English vocabulary teaching, Journal of Jiangsu University of Education (Social Science Edition), (1), 98-101.