Issues of Teaching English Prepositions to EFL Learners: Focusing on the Image Schema of English Prepositions

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Abstract: Some attempts have been made to incorporate knowledge from cognitive linguistics into ESL teaching methods in various ways. The acquisition of English prepositions is one of the examples, because the image-based instruction which originates in cognitive linguistics is believed to have large potential for more effective ESL teaching methods. The previous studies have investigated the effectiveness of EFL learners' use of images and introduced methodologies which have a positive effect on understanding the meaning of prepositions in comparison to the traditional approach without use of images. The purpose of this paper is to review the previous studies of teaching English prepositions using images. Additionally, this paper clarifies the validity of such instruction widely assumed in the literature. This paper classifies methodologies of previous experimental researches into three categories; "an approach focusing on central-image", "an approach focusing on semantic extension", and "an approach focusing on bottom-up". Moreover, two issues are suggested about the previous studies. One issue is the possibility to fossilize learner's understanding of extended meanings. The other is difficulty in giving students feedbacks on their errors through images.

1. Introduction

1.1 Teaching English Prepositions and Its relevance to Cognitive Linguistics

Nowadays, research is being conducted which takes the utility of linguistics in English as a Foreign Language (EFL) settings into account. In particular, cognitive linguistics is a new area of enquiry that informs mainstream EFL pedagogy and research (Tanaka, Sato and Abe, 2006). The method involving cognitive linguistics addresses grammatical items such as noun countability/ uncountability, phrasal verbs, and polysemy (Fujii, 2017). Many of these studies suggest that the instructions based on cognitive linguistic perspectives have more positive effects on learning than traditional ones[1].

In the previous studies, English prepositions are the one of the items addressed with a cognitive linguistics perspective and is taught thorough images. Mitsugi (2013) give four advantages of image-use, although it is concerned only with prototypical use. The first advantage is efficacy of vocabulary learning. In ESL environment where L2 (Second Language) exposure is limited, presentation of core meaning seems to be more efficient and feasible than providing learners with various senses. The second advantage is the way of presenting the core meaning. Learners understand the basic meaning of core intuitively through image use. The third advantage is that learners do not have to rely on their L1 when learning a word. By utilizing images, they understand the meaning of the word at the conceptual level, so the issue which comes from L1 use does not arise. The fourth issue is concerned with the learning process. An image-used instruction leads to deeper learning than a traditional method such as translation from L1. Because of these reasons, the previous studies assume the utility of using image and investigate effectiveness of it on learners' acquisition of English prepositions.

1.2 Two Major Models of Cognitive Linguistics in Teaching English Prepositions

The literature proposed various models of image diagrams of English prepositions. In the previous experimental studies, Lexical Core Theory, which Tanaka and Morimoto suggest, and PP (Principled Polysemy) model, which Tyler and Evans propose, are often used[3]. Lexical Core Theory is mainly used in Japanese experimental researches, and PP model is used in the foreign ESL environment. The following sections introduce both models succinctly.

1.3 Lexical Core Theory

Brugman (1981) and Lakoff (1987) point out that the meanings of the preposition *over* have the semantic network and that each distinct meaning can be represented as an image schema. As opposed to the lexical network model, which Brugman and Lakoff showed, Tanaka and Matsumoto (1997) propose the model called "Lexical Core Theory" in which only a core meaning, the central meaning where the various meanings derive, is assumed to exist[5]. Tanaka

and Matsumoto name the image of basic meaning and its corresponding meaning "Core-image" and "Core meaning", respectively. The core image of *over* is illustrated below in Figure 1.
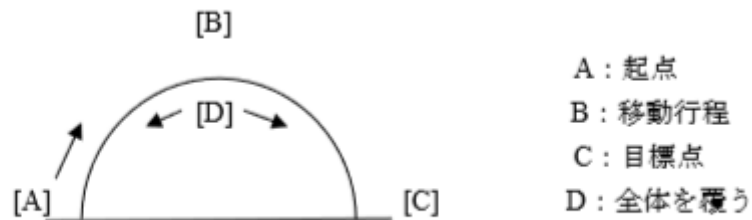

A：起点
B：移動行程
C：目標点
D：全体を覆う

Figure 1. Core-image of *over* (Tanaka and Matsumoto, 1997)

A variety of meanings of *over* are derived from the core through a change of a viewpoint. For example, the point [A] in the above diagram is taken as a focus in the sentence "the cat jumped *over* the fence". The point [B] is taken in the sentence "The plane is flying *over* the Pacific Ocean.".

1.4 PP model

While the Lexical Core Model shows only one central image, the PP model establishes various distinct image-schemas like the Brugman model and Lakoff model do. The model assumes the network between meanings in which the central meaning, what Tyler and Evans call "Proto-scene", is put in the center. The proto scene of *over* and the semantic network of it are shown below.
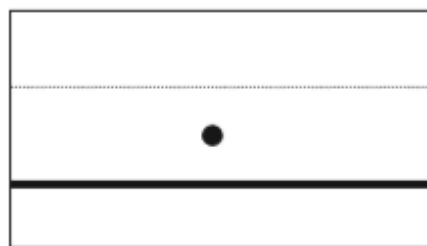

Figure 2. Proto-scene of *over* (Tyler and Evans, 2003)

above-and-beyond

(excess I)   completion

2. B •   2. C   transfer   focus-of-attention

                          2. D   covering   4. A

                                                 3.

2.A

on-the-other-   2.   4.

side-of   ABC   examining

trajectory cluster

                                   1. PROTOSCENE   6. reflexive

5.

up cluster

5. A   6. A

more   5. B   5. C   repetition

               control   preference
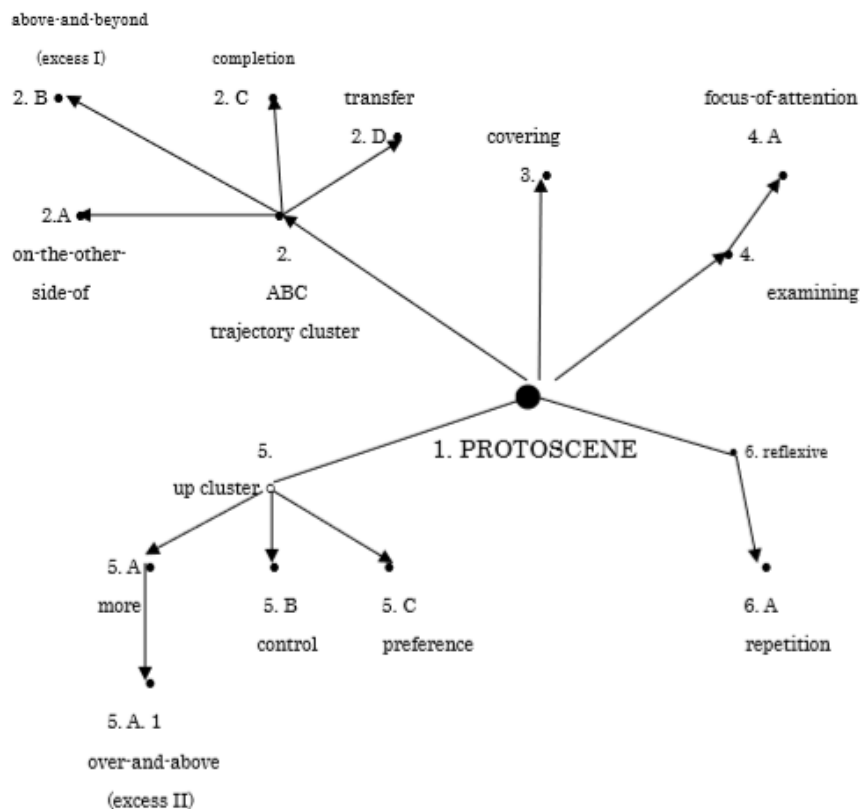
5. A. 1

over-and-above

(excess II)

Figure 3. Semantic network of *over* (Tyler and Evans, 2003)

In the PP model, the meaning of a particular preposition in a context is derived from such elements as our knowledge of the world, which is an essential difference from the models by Brugman and Lakoff (see Tyler and Evans (2003) for a more detailed discussion).

2. Purpose of this paper

This paper reviews the previous studies of teaching English preposition through image-use. Moreover, it clarifies issues of image-use in the instruction by reviewing the literature.

3. Three Types of Methodology of Teaching English Prepositions with Relevance to Cognitive Linguistics

This paper classifies the previous studies dealing with instruction of preposition into three types; *Focus on Central-image*, *Focusing on Semantic Extension*, and *Focusing on Bottom-up*. From 3.1.1 to 3.1.3, characteristics and issues of each methodology are explained.

3.1.1 Focusing on Central-image

In the approach focusing on central image, learners are given the central meaning of targeted prepositions or the central image of it. This method comes from the assumption that when students know the central meaning of the polysemy, they will understand the extended meanings of it too. Yasuhara (2011) teaches English prepositions with three types of approaches; on the basis of (i) image schema and core meaning, (ii) core meaning, and (iii) translation. In the instruction based on core meaning, an instructor teaches English preposition with core images and core meanings of prepositions. The second method, using the instruction of core meaning, the instructor gives the learners only the core meanings; in other words, instruction without image schema. In the translation-based instruction, the teacher shows the students various meanings of prepositions one by one like entries of a dictionary. The result of the post-test suggests the score in the lower class improves significantly in each instruction, but that in the upper class does not show significant change except the fact that the score of the core meaning instruction group in the upper class significantly decreases.

One of the drawbacks of this method is that the learner cannot understand the process of semantic extension from the central meaning or image. As explained in the previous chapter, a polysemy, in cognitive linguistics, has its own semantic network. The semantic network expands so radically from the prototype that the learner cannot grasp the meaning extended far from the center in the network. This is the one of the reasons why the approach focusing on central image does not show significant effectiveness of image use on acquisition of usage of a particular preposition.

3.1.2 Focusing on Semantic Extension

The methodologies which employ only a basic image or meaning are not effective because the learner cannot understand the meaning of the peripheral usages. One possible solution to this issue would be to explain the process of semantic extension from the prototypical meaning because the learner can understand how each extended meaning come from the prototype. This kind of explanation can be applied to not only peripherical expression around the prototype, but also more metaphorically extended usage.

Cho and Kawase (2012) is one of the researches mentioned above. They divided the participants into two groups; the "traditional approach group" (controlled group) and the "cognitive linguistics approach group" (experimental group). For the cognitive linguistics group, the instructor explained that various meanings of the English prepositions are related to one another with one central image schema. The participants were given the central image of *in*, *on*

and *at*. After that they were provided nine sentences and asked to produce images of the prepositions in each sentence. After completing the task, the instructor explained how each image the participants drew is related to the central image. Cho and Kawase implemented the test to check students' understanding of the prepositions in the course, and they compared the test score of the cognitive linguistics approach group to that of traditional group, in which the learners used a Japanese-English dictionary instead of an image schema. The result revealed the cognitive linguistics approach group showed a more significant effect on learning than the traditional group. Mitsugi (2013) also researched the effectiveness of core meaning instruction with implicit explanation of semantic extension. The instructor gave two different hint sheets to two groups of participants. They were allowed to use their hint sheet in answering multiple-choice questions. The core meaning-based group received the hint sheet which included core-image and core meaning of prepositions, and sentences and illustrations of other extended usage. Participants of Translation-based group gets the hint sheet consisting of the inventory of meanings of prepositions. The control group received nothing special. The overall result did not show that the core meaning instruction is more effective than other methods.

Tyler and Evans (2011) suggest that an instructor should start by introducing a visual representation of the proto-scene and emphasizing the spatio-physical configuration between a trajector (TR) and a landmark (LM), and move to scenes involving the distinct meanings. Niemeier (2017) also suggests the aim of using a cognitive grammar approach to teaching prepositions should be to convey the basic notions motivating the prepositions in question and raising learners' awareness of the basic spatial meaning of a word significantly facilitates their understanding of the extended meanings. The author also suggests visualization of the meaning schemas on all three meaning levels; namely spatial, temporal, and abstract.

The approach in which the instructor tells the learners the process of semantic extension can be said to have disadvantages, which will now be introduced. The first disadvantage is the likelihood of applying image-diagram into practice. In this approach, the instructor explains to the learners how one meaning comes from the prototype. According to Tyler and Evans (2003), only *over* has 14 distinct meanings except the prototype. Considering the teacher's lack of knowledge on cognitive linguistics, it can be impossible to teach all of the processes of the meaning extension.

The second disadvantage is the "Learning process" taken by learners. Schema is a kind of knowledge which someone abstracts away from the individual items. Both of the two approaches, "Focusing on Central-image" mentioned in 2.1, and "Focusing on Semantic Extension" addressed in this section, are both categorized as "top-down" because both methods give learners the basic meaning or the central image prior to the peripheral ones. As Tomasello (2003) states, however, language is thought to be learned through a usage-based process and schemas are built with a lot

of interactions with concrete examples. Taking into account all these statements above, a "bottom-up approach", in which learners make up the central image through concrete examples, should be taken to construct schema in learners' minds.

3.1.3 Focusing on Bottom-up

Fujii (2016) says that the bottom-up approach is more effective for acquisition of preposition usage than top-down approach and investigated the effectiveness of the former approach. Fujii's previous study revealed that changing the order of the central image and concrete examples does not show significant effect on learners' performance. In other words, it is not effective to show the example sentences before the central image. To address this issue, he implemented an exercise [4] after the presentation of the central image schema. Fujii (2017) investigated the effectiveness of a bottom-up approach on acquisition of prepositions. Fujii classifies the participants into two groups, bottom-up approach group and top-down approach group. In the bottom-up group, all the participants were divided into groups of four and wrote the common meaning or common image among the sentences given to them which have the target prepositions. After that, the instructor showed the basic images of prepositions and moved into the exercise session. In the exercise session, participants were told to keep in mind the central image of prepositions shown to them before. In the top-down group, students were given the core images of target prepositions prior to example sentences. The result was that, compared to the top-down group, the bottom-up group showed a significant gain in the delay test.

The bottom-up approach might be considered to be more suitable and effective at facilitating learners' understanding of prepositions usage, but it also has several issues to be addressed.

3.1.4 Issues of "Image-use" Based Instruction

Many of the previous experimental studies rely on the use of image, but "image use" has two issues that must be dealt with. First, it may fossilize the learner's understanding of extended usage. The farther the link is between the central meaning and the distinct derived meaning, the harder it is to see the process of the extension. As Huddleston and Pullum (2002) point out, there is certainly some degree of arbitrariness in the use of prepositions to express non-locative meanings. Therefore, learners have difficulty in grasping the metaphorical relation between the prototype and peripheral meaning because of the arbitrariness of semantic extension. Presumably, learners may overuse a figurative use of a particular preposition to others.

My pilot study was carried out to observe what image Japanese EFL learners had in mind when choosing an appropriate new preposition in a multiple choice test. In my pilot study, a participant answered the question and selected the most appropriate preposition matching in the context, and answered *on* for the question "The issue is (   ) the discussion". The student was

afterward asked in a follow-up interview how they answered the question, and she said that she actually employed the image of the preposition. The student was further asked what kind of image they were referring to, then they produced the (incorrect) image as given in the Figure below.

Figure 4. Students drawing of *on* in the sentence "The issue is (   ) the discussion."

The student applied the image of *on* to the context where another preposition should be selected instead. The author believes that this happened because the learner's semantic networks of *on* and *under* was not yet formed appropriately. In this case learners may wrongly apply an image of a preposition to other ones. Use of image schema has a large possibility to lead to these kinds of errors. In other words, the use of image can block learner's formation of semantic network.

Another problem to be addressed is related to feedback given to learners. When learners make an error with the figurative use of a preposition, instructors have difficulty in explaining why it is ungrammatical through image use. As for the instance mentioned above, the student chose *on* because they had an image of "the issue is put on the discussion". In this case, it is very difficult to give them feedback on the reason why their idea is wrong. Because of the arbitrariness, some of the non-locative usage of the preposition may be hard to explain through images.

3.1.5 Summary

The teaching methods of prepositions with image-use are categorized into three approaches. The characteristics of each method are shown below.

Name of Approach	Focusing on Central-image	Focusing on Semantic Extension	Focusing on Bottom-up
How to teach	Showing only a basic image	Basic image + explanation of semantic extension	Showing examples and making Schema in learners' mind
Top-down or Bottom-up	Top-down	Top-down	Bottom-up

Figure 5. Categorization of the three approaches with image-use

Most of these approaches use an image of a certain preposition, but it still has some issues as pointed out in the previous section. The first issue is the possibility of fossilize learners' understanding of extended use of prepositions. The second issue is the difficulty in giving learners feedback on their error of extended usage.

4. Conclusion and Future Research Implications

Images in cognitive linguistics are frequently applied to teaching methods of English preposition to ESL learners. Methods employed in the previous studies can be put into three categories such as; an approach focusing on central-image, an approach focusing on semantic extension, and an approach focusing on bottom-up. However, these approaches using images have some drawbacks. In future research, an alternative teaching method which overcomes issues of the image use, such as DDL (Data Driven Learning), could be promising.

Notes

[1] As Fujii (2017) points out, traditional approaches in the previous experimental studies are not identical. However, most of the traditional approaches take the method where learners use dictionaries and memorize each entry of the prepositions.

[2] There is a large scope of what can be included when considering "preposition". School grammar take the definition "preposition is a word class which shows a spatial relation between two object and follow NP". As Huddleston and Pullum (2003) suggest, preposition may be a much larger category than previous studies define. This paper, however, mainly discusses the methodology of teaching, so this issue is not addressed here.

[3] The explanative adequacy and validity of these models should be explained in terms of linguistics. However, this paper, mentioned above, deals with a methodology, so this issue is not discussed here.

[4] See more details in Fujii (2016).

[5] See Tanaka and Mastumoto (1997) for the detailed discussion of why they consider the model suggested by Brugman and Lakoff as inappropriate.

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