

## Effect of Schema-Based Instruction on Learning Polysemous English Prepositions: Analyzing through Learners' Perceptions\*

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The purpose of this study is to explore learners' perceptions on Schema-Based Instruction (SBI) for teaching the polysemous English prepositions (*in*, *on*, and *at*). SBI is a form of instruction based on the insights of cognitive linguistics and is a way of vocabulary learning and teaching, which provides learners with the schematic core meaning. The SBI has been expected to contribute to polysemous word learning, which is different from conventional ways of teaching polysemous words that most often offers learners a list of several prepositions and their corresponding meanings. The present study focuses on investigating learners' perception, which is indispensable for discussing the effectiveness of instruction. A questionnaire was conducted with 56 Japanese university students after the SBI and a practical experience to use core meaning. Data were analyzed qualitatively to extract constructs that learners possess on SBI, especially on core meaning. Based on the results, the effective points of core meaning in SBI perceived by learners consisted of applicability, efficiency as a learning method or tool, and practical for distinguishing between the use of prepositions. However, due to reasons such as insufficient understanding, there were learners who negatively perceived core meaning and learners who could not determine the effectiveness of core meaning. Although most learners in this study received a positive impression on core meaning with one-shot instruction, this research revealed that learners recognized the needs of continual training or exercise to make use of core meaning in their English using or English learning context.

**Keywords:** schema-based instruction, core schema, cognitive linguistics, learners' perception

### 1 Introduction

There is no doubt about the importance of vocabulary knowledge in learning a foreign language (Read, 2000; Saville-Troike, 1984). That is because the vocabulary forms the basis of the four language skills known as listening, reading, speaking, and writing. Also, vocabulary knowledge plays a

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particularly large role to improve those language skills and greatly affect the proficiency in English (Nation, 1997; Schmitt, 2010). However, mastering the use of prepositions has been regarded as notoriously difficult for English learners even though they are important to improve the depth of vocabulary knowledge (Cho, 2002). One of the sources of difficulty arises from the polysemous nature of each preposition (Tyler & Evans, 2004; Morimoto & Loewen, 2007). The majority of English prepositions have a variety of meanings, and language users are required to identify the intended sense depending on the context. However, multiple senses in a preposition are seemingly chaotic, which creates difficulty for English learners when trying to sense a preposition's meaning and apply it accurately. Thus, English learners often have difficulty in their ability to determine prepositional meanings and entirely grasp the multiple senses of each preposition appropriately.

Other sources of difficulty in learning English prepositions come from the semantic differences between the English language and the learners' mother language. For example, a native speaker of Japanese would have difficulties translating the prepositions *in*, *on*, and *at* into Japanese because there are overlapping meanings of *-de*, and *-ni* in Japanese. In this case, the meanings of each preposition in English are semantically not equivalent. Therefore, it could be suspected that learners may have been confused in selecting an appropriate preposition depending on the context utilizing their knowledge of mother language (Mitsugi & Nagashima, 2014).

Moreover, even English learners tend to look up only one translation in a dictionary appropriate to the context and memorize it. This is one common vocabulary learning strategy that English learners use, which is called, search-translation-equivalent (STE) strategy (Tanaka, 2006). This strategy makes learners use their first language (L1) as a device for learning the second language (L2) words. Using this strategy may not be entirely insufficient in itself. However, it produces negative effects on learning, such as to make learners regard each word as monosemous and tend not to pay attention to other multiple senses of each polysemous word (Imai, 1993; Tanaka, Sato & Abe, 2006). Therefore, if learners make assumptions about semantic equivalence between their L1 and L2, it often results in difficulty of learning and errors of using prepositions properly.

One of the keys to overcoming difficulties in learning polysemous prepositions is to define a word by the concept that runs through all its senses (McCarthy, 2001; Nation, 2001). In recent years, "core meaning," (Tanaka et al., 2006) which is based on the insights from cognitive linguistics is suggested as the ideal concept for a solution to the learning difficulties described above. Core meaning presents the common underlying meaning of a word by both descriptive representation and image-schematic representation (Sato & Tanaka, 2009), and it is as opposed to the most frequent or the primary meaning. It is referred to as a better way to reduce the

negative impact of Japanese learners' L1 on learning polysemous words. An image-schema presented in core meaning is called core-schema, and it includes brief descriptive explanations about how learners should construe the central concept of the meaning of polysemous words. Moreover, core-schema is language-neutral, and it provides an imagery understanding of the L2 word senses without being constrained by the learners' L1 equivalent (Morimoto & Loewen, 2007).

This study aims to apply the insight of core meaning to the instruction of polysemous prepositions and to analyze Japanese English learners' perceptions of the effectiveness of using core meaning, as well as the use of image-schema. The instruction implemented in this study is regarding core meaning and called schema-based instruction (SBI), which is adopted from Mitsugi (2017). This instruction method was statistically proven as an effective way of instruction using core meaning, which consists of an explicit explanation by instructors in which they identify core meaning and the way of utilizing the concept of core schema, not just by providing it. The main focus of this study is on considering learners' perceptions that they possess on SBI; for example, if learners perceive SBI as an effective method, the main points will be highlighted as well as their supporting reasons. The same will be conducted for ineffective perceptions. Previous studies applying core meaning on instruction presented the results of the effectiveness of core meaning through measuring lexical knowledge about the target English polysemous words including prepositions by using tests as a measuring tool. However, there are few pieces of the research that counterpoint learners' perception on the instruction-based research conducted in previous studies (Fujii, 2011; Mitsugi, 2017). It is significant to understand learners' perceptions of the instructions to get a deeper insight on how to effectively design more sophisticated instruction and cater to learners in a more efficient manner. This study focuses on a new angle of effective learning and teaching English polysemous words, especially on prepositions.

## **2 Research on Polysemous Words and Core Meaning**

As to the polysemous nature of words, discussions have been made in the framework of cognitive semantics that is located in the field of cognitive linguistics. Cognitive semantics is one of the areas of cognitive linguistics that aims to clarify the relationship between human cognition and structures of linguistic knowledge (Lakoff, 1987; Brugman, 1988). In cognitive semantics, for example, research has been conducted to describe and visualize how the meaning of words is perceived by mother language users. Approaches to the semantic analysis and description of polysemous words began with a study on the preposition *over* (Brugman, 1988; Dewell, 1994; Lakoff, 1987; Tyler & Evans, 2001, 2004). Research for the preposition *in*,

*on*, and *at* have also been conducted (Dirven, 1993; Goddard, 2002; Herskovits, 1988; Tyler & Evans, 2004). These studies attempt to produce image-schema on semantic structures of polysemous prepositions (Johnson, 1987; Lakoff & Johnson, 1980; Lakoff, 1987).

There are two main approaches to the polysemous word research that attempts to visualize the semantic structure of polysemous words using image-schema. Those are a lexical network approach (Lakoff, 1987; Tyler & Evans, 2001, 2004) and a core-schema approach (Dewell, 1994; Tanaka, 1987, 1990). The method of analysis in both approaches is different; for example, the former approach suggests that various senses in polysemous words form a network with a radial category, and the ability to visualize the network of all senses is the target of their research. On the other hand, the latter one suggests deriving the central meaning from all the senses of a polysemous word, and also attempts to visualize the image schema of a single central meaning as core meaning.

The present study attempted to apply the idea of core meaning to polysemous prepositions and examined the effectiveness of core meaning through learners' perceptions. Core meaning is based on the core theory that has been discussed by Tanaka et al. (2006). They suggest that if a word form is the same, it has a common underlying meaning. However, within each polysemous word, there is a single overarching meaning that governs all its senses. This overarching meaning is called core meaning, which is the best exemplar of the usages as well as a concept that grasps the whole semantic coverage of a word. Therefore, when core meaning is put into each context, various senses come out through context modification. Thus, the core meaning is the context-free meaning within every exemplar of a word (Figure 1).

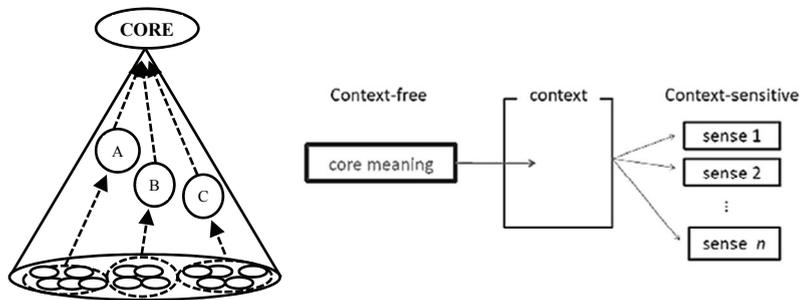


Figure 1. Concept of core meaning (Tanaka et al., 2006, p. 8)

There are two ways of representing the core meaning of a word, such as descriptive representation and image-schematic representation (Sato & Tanaka, 2009). For example, descriptive representation of *in* (Figure 2) is illustrated as “internal space.” As an image-schematic representation, it is explained with an illustration of a three-dimensional container that contains an object in it. The core schema of *on* and *at* is also shown in Figure 2.

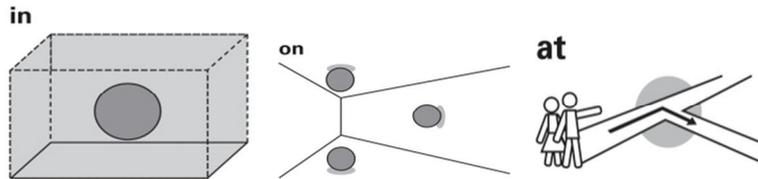


Figure 2. Core schema for *in*, *on*, and *at* (Tanaka et al., 2003)

This image of physical space is applied to the more abstract expansion of other spatial relationships by the projection of the image: psychological-space, social-space, temporal-space (Tanaka et al., 2006). For example, the image gradually extends to more abstract use like *the children in the bus* and *be in love* (figure 3). In this approach, the various peripheral senses are extended through the concept of core meaning with the projection of the core schema. In this study, the target words are the prepositions *in*, *on*, and *at* because they have strong polysemous nature and are frequently said to be some of the most difficult vocabulary items for EFL learners to use properly (Cho, 2002). SBI in this study is based on the explanation above about core-schema and the projection to various peripheral meanings. Not only that, it also includes how to apply core schema as the device to connect other extended meanings.

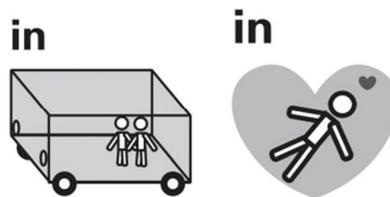


Figure 3. Extended image of *in* (*the children in the bus* and *be in love*) (Tanaka et al., 2003)

### 3 Previous Studies

Research aiming to apply core meaning to learning and teaching polysemous words started in the 1990s, and has been accumulating in volume, especially since the early 2000s. Table 1 shows a list of empirical researches on polysemous word learning and teaching research based on core meaning.

Table 1. An Inventory of Previous Studies on the Effect of SBI on Polysemous Words

Study	Targets for Learning		Effectiveness
Verspoor & Lowie(2003)	<i>taut, perennial, to spawn, shatter, forge, to rake, nugget, to gut, to peg, to nudge, bulge, smother, to skim, to boost, cog, to hoot, to sprawl, grapple</i>	Yes	For guessing and retention
Kojima(2006)	<i>dim, soar, hover, forge, sober, rigid, fling, stiff, gut, surge, hollow, penetrate, prevail, outlook, shrink</i>	Yes	For guessing and retention
Morimoto & Loewen(2007)	<i>over, break</i>	Yes	For <i>over</i> / Retention
Akamatsu(2010a)	<i>at, in, on</i>	No	
Akamatsu(2010b)	<i>hold, put, run</i>	No	
Yasuhara(2011)	<i>in, on, at</i>	Yes	More effective for lower proficiency learners of English prepositions
Fujii(2011)	<i>will, must, can may, should, shall</i>	No	*Including qualitative analysis
Mitsugi(2013)	<i>in, on, at, by</i>	No	Because of implicit instruction
Makni(2014)	<i>burn, beyond, break, over, hand, head, push, root</i>	Yes	Effective, but not for retention
Sato(2015)	<i>look, see</i>	Yes	For retention
Mitsugi & Nagashima (2014)	<i>in, on, at</i>	Yes	More effective for higher proficiency learners of English prepositions with explicit instruction
Fujii (2016)	<i>at, in, on, to, for, with</i>	Yes	More effective for higher English proficiency learners
Mitsugi (2017)	<i>in, on, at</i>	Yes	More effective with explicit instruction *Including qualitative analysis

The empirical research has been actively carried out and can be divided into two approaches. The first approach is to attempt to examine the effect of using core meaning as a meaning guessing or memory retention tool. For example, the focus of Verspoor & Lowie (2003) and Kojima (2006) is not to remember multiple meanings of polysemous words individually, but to attempt to construct networks of semantically related senses through core meaning and to make learners aware that meanings of polysemous words are related to each other. From the research based on the first approach, constructing semantic networks using core meaning to make smooth guesses of abstract meanings or figurative meanings of polysemous words was effective. Moreover, it became clear that this method of learning improves meaning retention of the polysemous senses.

The second approach focuses on the effectiveness of the core image on learning and teaching polysemous words (Akamatsu, 2010a, 2010b; Fujii, 2011, 2016; Makni, 2014; Mitsugi, 2013, 2017; Mitsugi & Nagashima, 2014; Morimoto & Loewen, 2007; Sato, 2015; Yasuhara, 2011). These researches focus on examining the effectiveness of SBI on learning and teaching polysemous words in comparison with the conventional learning method using the description of the dictionary called translation-based instruction (TBI). From the previous research of the second approach, it became clear that a certain positive effect of the instruction was observed, especially on the preposition. It was also revealed that there is a possibility that effectiveness of SBI may be influenced by learners' levels of prior knowledge or cognitive ability. As a rare case, two researches in Table 1 conducted qualitative analysis to probe learners' perception (Fujii, 2011; Mitsugi, 2017). For example, Mitsugi (2017) implemented qualitative analysis to understand how learners compared the effectiveness of the two different instruction methods, SBI and TBI. The results showed that learners perceived both benefits and disadvantages in the two instruction methods, which suggests the necessity of separate-use depending on the learning situation.

The previous research above showed partial effectiveness of SBI with core meaning; hence it is clear that SBI has a positive effect on learning polysemous words. Almost all these studies are comparing the effectiveness of core meaning based on a quantitative approach, which is the mainstream of this research area. However, for the most part, the previous studies seemed insufficient to meet all the requirements for overcoming learning obstacles. The reason is that there are quite a few studies attempting an emphasis on cognitive factors with consideration for how learners applied the instruction based on core meaning and how they are accepted or perceived by learners. In other words, research that analyzes based on the learner's point of view is almost untouched, as research up until now has been repeatedly solely focused on examining the effectiveness of core meaning through quantitative analysis. As the subject of actual learning as a learner, the learner's point of view is indispensable for the discussion of the effectiveness of instruction.

Therefore, further research is required to demonstrate the effectiveness of instruction focusing on the learners' perceptions. The intended aim through this research is to analyze by a qualitative approach and specifically, what kind of perceptions the learners possess when using the core meaning in SBI. Furthermore, the research attempts to lead to more clarification on specific factors, which cause the presence or absence of effectiveness on core meaning for learning and teaching polysemous words. Based on the arguments that were set forth above, this study examined the following research question:

RQ: What kind of perceptions do learners possess on using core meaning in SBI when learning polysemous prepositions; *in*, *on* and *at*?

## 4 Methods

### 4.1 Participants

56 Japanese learners of English participated in this study. All of the participants were university sophomores majoring in English. They spoke Japanese as their L1 and had received formal English education for approximately seven to nine years by the time of the study, which was conducted in June, 2015. In this study, the participants' breadth of vocabulary knowledge was assessed using the vocabulary size test (Nation & Beglar, 2007) and the results showed that their average vocabulary size was 3500 words. They took an English vocabulary class as a required course once a week and were assembled from four different classes. Prior to the administration of the study, participants who agreed to take part signed consent forms.

### 4.2 Procedures

#### 4.2.1 Schema-Based Instruction and experience of using core meaning

Table 2 shows the procedure of the instruction and data collection in the present study.

Table 2. Procedure of the Instruction and Data Collection

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<u>Phase 1 (30 min.)</u>
Schema-Based Instruction based on Mitsugi (2017)
1. Task 1 (SPACE) + Answer check
2. Task 2 (TEMPORAL & ABSTRACT) + Answer check
3. Teacher's explanation
4. Learners' individual review
<u>Phase 2 (15 min.)</u>
Experience of using core meaning

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Phase 3 (10 min.)

Questionnaire

Question 1: 5-point Likert-scaled

Question 2: Free description

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To explore learners' perceptions on the instruction based on core meaning, learners needed to receive SBI prior to the questionnaire. The SBI used in this study was adopted from Mitsugi (2017) and was statistically proven as an effective instruction in comparison with TBI and the control group. To summarize the SBI in Mitsugi (2017), it consists of the four steps listed below:

1) Task 1 (Categorizing-task 1):

Learners were given a task sheet including illustrations of the core meanings for each preposition. As options for categorizing, there were nine illustrations of spatial-use (SPACE) of each preposition, which showed the similarity using core meaning to make the prepositions easily imaginable to categorize and understand the relationship between core-schema.



Figure 4. Examples of sample illustrations for spatial-use (SPACE) prepositions used in Task 1 (Mitsugi, 2017)

2) Task 2 (Categorizing-task 2):

The learners were given another task sheet that was the same type as the one used in Task 1; however, there were nine options including illustrations of extended-use (TEMPORAL & ABSTRACT) of each meaning of the prepositions.

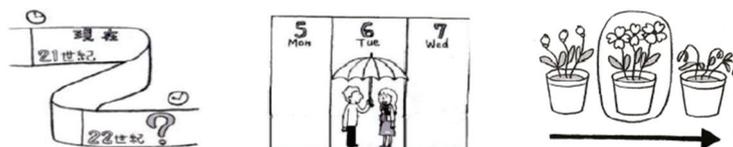


Figure 5. Examples of sample illustrations for extended-use (TEMPORAL & ABSTRACT) prepositions used in Task 2 (Mitsugi, 2017)

### 3) Teacher's explicit explanation

A teacher (author) explained explicitly how core meaning was related to peripheral senses and utilized for semantic extension from core meaning to each use of preposition. It was assumed that this explicit instruction could give the learners a concrete understanding of how the senses are semantically related and how core meaning is used as a device for semantic extension depending on the similarity between core meaning and extended senses. Figure 4 is the example of the slides used in this instruction.

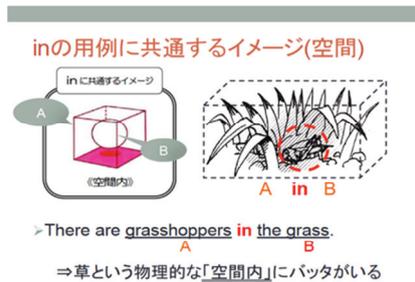


Figure 6. Example of the slides used in SBI (Mitsugi, 2017)

### 4) Learners' individual review

Learners were given a handout that briefly summarized the contents of instruction (For more details about SBI in this study, please see Mitsugi, 2017).

After the instruction, learners were given 15 minutes for experiencing the use of core meaning as a learning tool through answering the 9 questions (Table 3). The test was designed in multiple-choice style and the participants chose one appropriate preposition from three choices: *in*, *on* and *at*.

Table 3. 9 Multiple Choice Questions for Experiencing the Use of Core Meaning

Questions	Answer
1. I told the caller to phone again (in / on / at) 24 hours.	in
2. He often drops in to see me (in / on / at) Sundays.	on
3. He laughed (in / on / at) me.	at
4. He kissed her (in / on / at) the cheek.	on
5. We talked (in / on / at) the phone.	on
6. He dipped his brush (in / on / at) the paint.	in
7. Unemployment is (in / on / at) the increase.	on
8. Many children are still (in / on / at) risk from neglect or abuse.	at
9. There is no special event (in / on / at) this time of year.	at

#### 4.2.2 Questionnaire

To understand learners' perception on the instruction based on core meaning, participants were asked to answer two questions after the instruction and experience of using the concept of core meaning. In question 1, learners were

asked about the effectiveness of core meaning: “Do you think core meaning is effective for learning polysemous prepositions?” In the context of this research, learners assumed polysemous prepositions as *in*, *on* and *at*. A 5-point Likert-scaled question, which was provided in the question 1 such as “strongly agree,” “agree,” “neither agree nor disagree,” “disagree,” “strongly disagree.” The second one was a free description type question asking the reason for choosing the option in the question 1. The answers were used as data for the qualitative analysis.

#### 4.2.3 Qualitative data analysis

The data collected in question 2 was analyzed with the Steps for Coding and Theorization (SCAT) proposed by Otani (2008, 2011). SCAT is a method of qualitative data analysis, which is suitable for the explicit analyzing process and small-scale data. The process of analysis in this method has four steps as follows: (1) extract key words from the original texts; (2) paraphrase them with other terms; (3) add concepts from out of the text that account for step (2); and (4) create the themes or constructs in consideration of the contexts. With emerging key themes in step (4), the next procedure is writing a storyline and a theory from the storyline. Table 4 shows an example of the SCAT analysis of statements made by learners. In this study, the analysis was interpreted by two researchers including the author. The storylines and theory writings were developed and discussed among the same two researchers.

Table 4. Example of SCAT Analysis

Text	<1>
	extract key words from original texts
I use prepositions frequently but I did not consciously use the core meaning in English reading. I think that I can use them without any hesitation on selecting them at the time of speaking in the future.	use prepositions frequently / did not consciously use / reading / use / without any hesitation / selecting / speaking / in the future

Table 4. (continued) Example of SCAT Analysis

<2> paraphrases of <1>	<3> concepts from out of the text that account for <2>	<4> themes, constructs in considerations of context
<i>in</i> , <i>on</i> and <i>at</i> are frequent words / use <i>in</i> , <i>on</i> and <i>at</i> unconsciously / reading English text / use <i>in</i> , <i>on</i> and <i>at</i> confidently / English speaking situation / after the instruction	in past learning experiences, instruction and application practice for prepositions are insufficient / differences in preposition meanings and distinct use had been left unclear	application of the core meaning knowledge in English communication / application of the core meaning knowledge for confident choices when using prepositions

## 5 Results and Discussion

### 5.1 Results and discussion of the question 1

This study qualitatively investigated learners' perceptions about using core meaning as a method of learning polysemous prepositions. The question was "Do you think core meaning is effective for learning polysemous prepositions?"

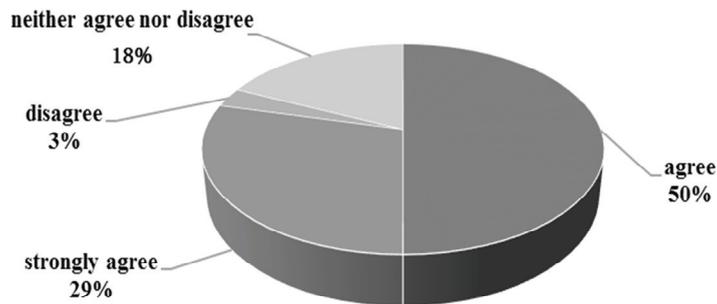


Figure 7. Result for 5-point Likert-scaled question

From the results of the 5-point Likert-scaled question (Figure 7), there were no participants who chose "strongly disagree." 2 participants (3%) answered as "disagree," and 10 participants (18%) answered as "neither agree nor disagree." 28 participants (50%) answered as "agree," and the other 16 participants (29%) answered as "strongly agree." In this study, answers in the first question were divided into three groups such as "Positive," "Neutral," and "Negative" in order to grasp learners' perceptions in a simpler way. 79% of participants positively perceived effectiveness of core meaning in SBI. However, 18% perceived the effectiveness as neutral and 3% perceived it as negative.

### 5.2 Results and discussion of the question 2

#### 5.2.1 Learners' perceptions: Positive group

Answers of the question 2 were also divided into three groups based on the groups above, and then a qualitative data analysis was carried out applying an SCAT analysis. The results of interpretation and conceptualization based on the constructs extracted from the data through SCAT analysis are summarized in Table 5, 6 and 7.

Table 5 shows perceptions of learners who think that core meaning in SBI is effective.

Table 5. Perceptions of Learners (Effective)

Distinction of perception	Category	Constructs emerged from analysis
Positive [1]	Applicability	<In English communication> <For confident and appropriate preposition choices> <In several English learning contexts> <Necessity of ongoing training on using core meaning>
Positive [2]	Effective learning method and tool	<Negative impression as a conventional way of learning> <Efficient for guessing, understanding and memorizing> <Necessity of explicit instruction>
Positive [3]	Practical criteria for distinctive use	<Enable appropriate use (choice)> <Effective preposition learning> <Decreasing errors in preposition use> <Improvement in English proficiency>

Learners who answered as “Positive” perceived core meaning in SBI with three different categories: “Applicability,” “Effective learning method and tool” and “Practical criteria for distinctive use.” Learners perceived that the applicability is the effective point of using core meaning. They recognized that the knowledge of the core meaning of the prepositions obtained from the instruction can be applied in several English learning situations, such as reading, speaking, writing and grammar. Besides, they perceived that the use of core meaning leads their improvements in their ability to confidently choose and recognize appropriate prepositions and make certain connections to situational usages. Moreover, they expected future improvement of applicability through ongoing training with applying their acquired knowledge of core meaning to their English learning situation.

Referring to “Learning methods and tools,” in comparison with the conventional way of learning prepositions, learners recognized that the efficiency is one of the effective points of using core meaning for learning prepositions. Their conventional way of learning prepositions is using English-Japanese dictionaries, which offers learners a list of several meanings of each preposition. This method tends to encourage students to memorize one word in a list with a strong belief of one-to-one correspondence in the meanings between English and Japanese words. This way of learning polysemous words produced ambiguous understanding of the meanings, not to mention it can be a lot more time consuming to memorize each meaning depending on the context. Compared to conventional preposition learning methods, core meaning that can be interpreted in terms of images (image-schema), makes guessing, understanding and memory to be efficient, which ultimately results in learners' satisfaction. However, they did recognize some ambiguity in their level of understanding prepositions based

on the core meaning approach. As a result, the construct such as the necessity of explicit instruction to clarify the basis for choosing a preposition was extracted as a perception.

Another perception on the effectiveness of core meaning is a “practical criteria for distinctive use of prepositions.” The reason for this is that decisions based on existing knowledge, except core meaning, may cause errors of using prepositions. Whereas, core meaning provides intuitive understanding through images and enables learners to use or select prepositions properly depending on the context. Moreover, they recognized that core meaning improves effective learning of prepositions and reduction in errors for preposition-use, which led to an improvement in English proficiency.

### 5.2.2 Learners’ perceptions: Neutral group

Table 6 shows perceptions of learners who answered that they currently cannot determine whether core meaning in SBI is effective or not.

Table 6. Perceptions of Learners (Undeterminable)

Distinction of perception	Category	Constructs emerged from analysis
Neutral [1]	Limited effectiveness	<Limited situation> <Satisfaction with pre-existing knowledge>
Neutral [2]	Incompatible	<Preference on original learning style> <Incompatible with own pre-existing knowledge>
Neutral [3]	Insufficient understanding	<Undeterminable because of insufficient understanding> <Need for further application practice>

Learners who answered as “Neutral” perceived core meaning in SBI with three different categories: “Limited effectiveness,” “Incompatible” and “Insufficient understanding.” Learners in neutral group perceived limited effectiveness to core meaning in SBI. For example, core meaning is effective when they encounter a difficulty of distinguishing and selecting the appropriate meaning by using existing knowledge. However, learners’ felt that there are some cases in which it is possible to deal with pre-existing knowledge without the concept of core meaning. This means that, for the learners, it depends on their situational sense of preposition-use, which is a main factor in whether it is effective or not.

“Inconsistency” is the other category emerged from the learners’ constructs in the neutral group. Learners who had this perception selected neutral, however, the constructs that emerged from the analysis can be interpreted as a negative idea. They recognized an inconsistency with their original learning style and the learning style of core meaning. In addition,

learners perceived incompatibility to meaning representation of core meaning compared to their own pre-existing knowledge.

On the other hand, the third perception in the neutral group can be categorized as “Insufficient understanding.” Learners were not able to determine the effectiveness because of their insufficient understanding on core meaning in SBI. However, since SBI in this study was a one-shot instruction taking only 30 minutes and learners were given only 15 minutes to experience and apply the idea of core meaning to their learning, they recognized the need for further continuous accumulation of application opportunities to determine the effectiveness.

### 5.2.3 Learners’ perceptions: Negative group

Table 7 shows perceptions of learners who answered that core meaning in SBI is not effective.

Table 7. Perceptions of Learners (Ineffective)

Distinction of perception	Category	Learners’ Perceptions
Negative [1]	Learning style	<Emphasis on natural acquisition based on own language experience>
Negative [2]	Difficulty	<Difficulty in understanding the concept of core meaning>

Learners who answered as “Negative” perceived core meaning in SBI with two different categories: “Learning style” and “Difficulty.” Since the learners in this group had difficulty in understanding the concept of core meaning itself, they recognized the preference for natural acquisition based on the experience of language use rather than the acquisition of new knowledge by learning with core meaning.

## 6 Conclusion

This study posited one research question and conducted a questionnaire analysis. The research question was concerned with the learners’ perceptions about using core meaning in SBI when learning polysemous prepositions; *in*, *on* and *at*. The results of question 1 showed that under 80% of learners regarded using core meaning in SBI as effective for learning polysemous prepositions. Less than 20% of learners avoided concluding their stance on effectiveness of core meaning. However, quite a few learners considered core meaning to be ineffective. As a result, it became clear that there is a high possibility that the learners considered core meaning to be effective when they use it in their instruction of prepositions.

Question 2 revealed the perceptions of learners in three different groups, which included a positive, neutral and negative group. Learners in the positive group admitted that the applicability is the merit of core meaning in SBI. They recognized that core meaning could be applied to various English learning situations and would work well for a criterion in selecting appropriate prepositions depending on the contexts. Additionally, they perceived that core meaning is a valuable tool and method to learn polysemous prepositions compared to learning through dictionary-use. They also recognized efficiency in the aspects of guessing, understanding and memorizing, as an effective point of core meaning in SBI. Moreover, they admitted that these effective points would result in reducing errors when using polysemous prepositions.

A learner who could not determine whether core meaning in SBI is effective or not, had a recognition that would be classified as positive, neutral or negative, even if they were in a neutral group. For example, learners who insisted on effectiveness, recognized that core meaning is effective when it is difficult to distinguish and select prepositions which fit to context by pre-existing knowledge. However, this effectiveness was limited to when they could not make conclusions based on their pre-existing knowledge. Also, they avoided making conclusions based on their judgment of effectiveness from their perceptions of a need for more opportunities for further applications, as well as the insufficiency of their understanding.

Learners of the negative group insisted that they have their own unique learning styles and preferences, and that there was a discrepancy between their understanding and core meaning. They emphasized that they prioritize learning based on their experiences of preposition-use, and their negative opinion on the effectiveness of core meaning came from the difficulty of the concept of core meaning itself.

Although most learners in this study received a positive impression on core meaning with one-shot instruction, they recognized the needs of continual training or exercise to make use of core meaning in their English-use or English learning context. Therefore, if teachers attempted to teach prepositions with core meaning, the instruction should be designed to allow ongoing training or exercise to use core meaning, not the one-shot instruction. Although Morimoto (2009) and several other researchers also mentioned the importance of exercise, further research is required in order to suggest the specific and systematic ways of continuous training or exercise. In addition, this study proposed the importance of learners' perception toward the research area which attempts to apply core meaning to learning and teaching vocabulary. Therefore, much more research which targets to explore learners' perceptions is necessary to clarify specific factors causing the presence or absence of effectiveness of core meaning to provide more sophisticated ways of learning and teaching polysemous words.

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**Appendix**  
**Storyline and Theory Writing Extracted from SCAT Analysis**

Story- line	<p>[Positive]</p> <ul style="list-style-type: none"> <li>- Learners perceived that the applicability is the effective point of using core meaning. They recognized that the knowledge of the core meaning of the prepositions obtained from the instruction can be applied in several English learning situations, such as, reading, speaking, writing and grammar.</li> <li>- As well as improving their ability to confidently choose and recognize appropriate prepositions and make accurate connections to situational usages.</li> <li>- Learners expected future improvement of applicability through ongoing training with applying their acquired knowledge of core meaning to their English learning situation.</li> <li>- Learners perceived that their conventional way of learning prepositions produced ambiguous understanding of the meanings, and it can be a lot more time consuming to memorize each meaning depending on the context.</li> <li>- Core meaning makes guessing, understanding and memory to be efficient, which ultimately results in learners' satisfaction.</li> <li>- Learners recognized some ambiguity in their level of understanding prepositions based on the core meaning approach.</li> <li>- Learners perceived the necessity of explicit instruction to clarify the basis for choosing a preposition was extracted as a perception.</li> <li>- Learners perceived that decisions based on existing knowledge, except core meaning, may cause errors of using prepositions.</li> <li>- Core meaning provides intuitive understanding through images and enables learners to use or select prepositions properly depending on the context.</li> <li>- Learners recognized that core meaning improves effective learning of prepositions and reduction in errors for preposition-use, which led to an improvement in English proficiency.</li> </ul>
	<p>[Neutral]</p> <ul style="list-style-type: none"> <li>- Core meaning is effective when they encounter a difficulty of distinguishing and selecting the appropriate meaning by using existing knowledge.</li> <li>- Learners' perceived that there are some cases in which it is possible to deal with pre-existing knowledge without the concept of core meaning.</li> <li>- Learners recognized an inconsistency with their original learning style and the learning style of core meaning.</li> <li>- Learners perceived incompatibility to meaning representation of core meaning compared to their own pre-existing knowledge.</li> <li>- Learners were not able to determine the effectiveness because of their insufficient understanding on core meaning in SBI.</li> <li>- Learners recognized the need for further continuous accumulation of application opportunities to determine the effectiveness.</li> </ul>
	<p>[Negative]</p> <ul style="list-style-type: none"> <li>- Learners recognized the preference for natural acquisition based on the experience of language use rather than the acquisition of new knowledge by learning with core meaning.</li> </ul>

	<ul style="list-style-type: none"> <li>- Learners had difficulty in understanding the concept of core meaning itself.</li> </ul>
Theory writing	<p>[Positive]</p> <ul style="list-style-type: none"> <li>- Core meaning could be applied to various English learning situations and would work well for a criterion in selecting appropriate prepositions depending on the contexts.</li> <li>- Core meaning is a valuable tool and method to learn polysemous prepositions compared to learning through dictionary-use.</li> <li>- Efficiency in the aspects of guessing, understanding and memorizing, as an effective point of core meaning in SBI.</li> <li>- Effective points would result in reducing errors when using polysemous prepositions.</li> </ul>
	<p>[Neutral]</p> <ul style="list-style-type: none"> <li>- Core meaning is effective when it is difficult to distinguish and select prepositions which fit to context by pre-existing knowledge.</li> <li>- The effectiveness was limited to when they could not make conclusions based on their pre-existing knowledge.</li> <li>- There is a need for more opportunities for further applications.</li> </ul>
	<p>[Negative]</p> <ul style="list-style-type: none"> <li>- Unique learning styles and preferences exists.</li> <li>- There was a discrepancy between their understanding and core meaning.</li> <li>- There was a difficulty in understanding the concept of core meaning.</li> </ul>

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