

## **Difficulty in restructuring foreign-language vocabulary knowledge: Polysemous verbs**

Nobuhiko Akamatsu  
Doshisha University

### **ABSTRACT**

This study examined the effectiveness of a cognitive linguistics (CL) approach in improving the foreign-language learner's knowledge of English polysemous verbs (i.e., *hold*, *put*, *run*). An original test was administered to Japanese learners of English as a foreign language in order to assess their knowledge of the target verbs. While taking the test, one group (i.e., the CL approach group) was allowed to read a text explaining the core and peripheral senses of each target verb; the other group (i.e., the control group), in contrast, took the test without such supplementary materials. Results showed no statistically significant difference in the test scores between the CL approach and the control group. This finding implies that simply introducing the core and peripheral senses of polysemous verbs may not induce learning by itself.

**Key words:** cognitive linguistics, vocabulary knowledge, conceptual change

### **I. INTRODUCTION**

Cognitive linguistics (CL) has enjoyed popularity in research on not only second language acquisition (SLA) (e.g., Achard & Niemeier, 2004; Boers & Lindstromberg, 2008; Byrnes, Weger-Guntharp, & Sprang, 2007; de Knop & de Rycker, 2008; Jarvis & Pavlenko, 2008; Robinson, 2008), but also foreign language learning (FLL) (e.g., Tanaka, Sato, & Kawahara, 2007). For example, cognitive linguistic perspectives on lexical representation are appealing, because they appear to make a unique contribution to language learning and instruction. In fact, it has been reported that second language (L2) or foreign language (FL) learners benefit from cognitive linguistic insights into idioms (e.g., Boers, 2000; Boers & Demecheleer, 2001; Boers, Eyckmans, & Stengers, 2007), metaphors (e.g., Deignan, Gabrys, & Solska, 1997), polysemous words (e.g., Boers & Demecheleer, 1998; Csábi, 2004; Verspoor & Lowie, 2003), and prepositions (e.g., Lindstromberg, 1996). These findings suggest that a learning approach based on cognitive linguistic insights (i.e., the CL approach) provides the learner a better understanding of various linguistic items than do more conventional approaches.

A crucial concept underlying the CL approach is that language reflects one's general conceptualization, individual experience, and cultural background. Language is regarded as a

means to represent how a person cognizes or experiences the world. In this view, major linguistic aspects are interpreted in a rather different manner from so-called “mainstream” linguistics (e.g., Chomskian linguistics). For example, in CL, grammar is seen as “an essential aspect of the conceptual apparatus through which we apprehend and engage the world” (Langacker, 2008, p. 4), and grammatical forms and elements are analyzed with respect to their conceptual relations with meanings. The lexicon is also explained quite differently. Cognitive linguists view the lexicon as reflecting the general cognitive principles of human beings; the associations of lexical items with their corresponding senses and meanings are emphasized in the CL research. In mainstream linguistics, on the other hand, the lexicon is regarded as a static, arbitrary list of words and word classes that play no major linguistic roles. This difference in perspective explains why polysemy, which has not attracted much attention in mainstream linguistics, has been one of the focal issues in CL.

In structuralist and generative linguistics, polysemy only plays a minor role. By contrast, the focus on relationships between language and cognition in CL shows polysemy in a new light. Polysemy has been explored as a major research theme in CL, and it has been pointed out that the distinct senses or meanings of a polysemous word are highly associated (Cuyckens & Zawada, 2001). The relationships among the senses are described as core and periphery (e.g., Lakoff, 1987), family resemblance (e.g., Taylor, 2003), or lexical networks (e.g., Tyler & Evans, 2003). Despite the difference in perspective, however, the distinct senses are seen to be associated through meaning chains, rather than related on the basis of one semantic or cognitive commonality (e.g., Gibbs & Matlock, 2001). This cognitive linguist view on polysemy has influenced SLA and FLL. Specifically, cognitive linguistic proposals such as conceptual metaphors or the radial structure of lexical senses are considered a major facilitating factor in SLA and FLL.

Csábi (2004), for example, claims that conceptual metaphors facilitate learning polysemous verbs. Hungarian students were taught the English verbs *keep* and *hold*, provided with their core and peripheral senses (i.e., more distant from the core sense). The senses of *keep* and *hold* were introduced, using conceptual metaphors (e.g., CONTROL IS HOLDING SOMETHING IN THE HAND), keywords (e.g., “hand and control” for the verb *hold*), drawings, and representative example sentences. Csábi found that the CL approach (e.g., clear explanation of how the seemingly different senses of a polysemous word are associated) was more effective in learning polysemous words than the conventional approach, such as memorizing words with their first language (L1) equivalents.

Verspoor and Lowie (2003) also underscored the effectiveness of vocabulary learning based on the radial structure of lexical senses. Dutch learners of English were provided two types of English sentences containing polysemous words: sentences containing polysemous words in a core sense and those in a peripheral sense. While learning the English sentences, the learners were asked to discover and memorize semantic connections between the senses of each polysemous word. Verspoor and Lowie found that providing the core senses of polysemous words promoted more correct guessing and better retention of the figurative senses of unfamiliar polysemous words.

Along with these studies, previous studies favoring the CL approach in learning polysemous

words emphasize the “conceptual relatedness” of to-be-learned items. They argue that overt explanation of the conceptual relatedness between the target items enhances the learner’s awareness of their underlying commonalities and helps the learner understand their usage in depth. There is, however, another camp which raises caution against this view.

Conceptual relatedness of various senses in a polysemous word is the kind of knowledge that one develops through encountering the word in various contexts. Such knowledge is generally acquired in an implicit manner, and conceptual relatedness of polysemous senses is not normally realized unless it is made explicit. The critical claim of the CL approach is that L2 or FL learners can improve their proficiency by *explicitly* learning the lexical knowledge that native speakers acquire *implicitly*. This view, however, can be controversial because there have been disputes over the usefulness of explicit and implicit learning in SLA and FLL (e.g., DeKeyser, 2003; Ellis, 1995; Ellis, Loewen, Elder, Erlam & Philp, 2009; Hulstijn, 2005).

Krashen (1985), for example, argues that consciousness during learning affects knowledge. He hypothesizes that conscious learning (i.e., Learning) results in explicit knowledge whereas subconscious learning (i.e., Acquisition) results in implicit knowledge. According to Krashen, explicit and implicit knowledge do not interact with each other (e.g., explicit knowledge does not transform into implicit knowledge, and vice versa), because these two types of knowledge differ in their fundamental structures. He also claims that implicit knowledge plays a more important role in advanced linguistic performance. It is noteworthy that, despite the fact that Krashen’s hypotheses are often criticized (e.g., Gregg, 1984; McLaughlin, 1978; Sharwood Smith, 1981), his view of implicit knowledge as being more useful than explicit knowledge in advanced cognitive ability is supported by many SLA researchers (e.g., Ellis et al., 2009). In other words, in SLA, it is assumed that explicit knowledge may not function as effectively and fully as implicit knowledge in advanced linguistic performance (DeKeyser, 2003; Krashen, 1994).

This study examines the effectiveness of the CL approach in helping FL learners develop in-depth knowledge of English polysemous verbs. The study focuses on whether or to what extent explicit knowledge about the core sense of a polysemous word benefits FL learners in understanding different senses of the polysemous word. This focus is motivated by research findings implying the facilitative advantage of the CL approach over the conventional approaches. If the CL approach leads to a better understanding of lexical items, as previous studies suggest, it should improve FL learners’ performance in usage of polysemous verbs.

## II. METHOD

### I. Participants

A total of 80 FL learners participated in this study. All the participants were Japanese university students majoring in English, and they had received formal English education for approximately 8 to 10 years at the time of the study. No one had lived in an English-speaking country for more than one year.

## 2. Tests

All the participants had taken an institutional TOEFL approximately three months before the time of the study; the scores were used to assess the participants' English proficiency. The total TOEFL scores ranged from 413 to 567 (max = 680; M= 505.5, SD= 32.9). The listening comprehension scores ranged from 33 to 52 (max = 68; M= 45.6, SD= 4.2); the grammar scores ranged from 41 to 63 (max = 68; M= 53.9, SD= 4.7); the reading comprehension scores ranged from 42 to 62 (max = 68; M= 52.1, SD= 3.9).

Nation's vocabulary size test (Nation & Nation, 1990) was adopted and administered to assess the participant's vocabulary knowledge. The test consisted of five sections, each of which was designed to measure vocabulary knowledge of a specific vocabulary-size level (2,000-, 3,000-, 5,000-, and 10,000-word levels), and also an academic word level. Each section had 18 questions.

An original test was created to measure the participant's knowledge of the target verbs: *hold*, *put*, and *run*. The test consisted of 45 sentences, 15 sentences for each verb, and one-third of the 15 sentences contained inappropriate, unconventional usages of the verb in question (see Appendix A). The participant's task was to choose sentences with inappropriate usage. This test format was chosen to focus on the learner's receptive vocabulary knowledge, rather than productive knowledge which is seen as more demanding in acquisition (Read, 2000). The test was created with reference to an English textbook (Tanaka et al., 2007) and an English-Japanese bilingual dictionary (Konishi & Minamide, 2001). All the sentences accompanied their Japanese translations.

## 3. Procedure

The study consisted of two stages. First, the participants were given the vocabulary size test. After the test, they filled in a questionnaire on their educational backgrounds and experience living abroad. According to the vocabulary-test and institutional TOEFL scores, the participants were divided into two groups in such a way that each group was equivalent in English proficiency and vocabulary size (see Appendices B and C).

One week after the first stage, the original verb test was administered. In addition to the test, the participants in one group (i.e., the CL-approach group) were provided written material that explained the core and peripheral senses of each target verb in Japanese. The material was adopted from an English textbook that focused on the usefulness of core senses (Tanaka et al., 2007) (see Appendix D). In contrast, the participants in the other group (i.e., the control group) were given the test only. The participants in both groups were told to pay attention to appropriateness in usage of the verbs while they were answering the questions. The administration time was approximately 30 minutes.

## 4. Experimental design and data analysis

Data were analyzed with group (CL approach group and control group) as a between-subjects factor, and verb (*hold*, *put*, *run*) as within-subjects factors, using a MANOVA procedure to avoid Type I error (see O'Brien & Kaiser, 1985). The scores in the verb test constituted the dependent measures.

### III. RESULTS

Table 1 lists the means and standard deviations of verb-test scores for each group under all the conditions.

Table 1. *The Mean Verb-Test Scores for Each Group under All Conditions*

	hold	put	run	total
CL Approach Group (N=36)	7.2 (2.1)	10.9 (1.7)	8.1 (1.5)	26.3 (3.0)
Control Group (N=44)	8.5 (1.9)	10.8 (2.0)	7.8 (1.8)	27.0 (3.4)

*Note.* Values enclosed in parentheses represent standard deviations. The maximum score for each verb is 15.

There was no significant main effect of group type,  $F(1,78) = .99$ ,  $\eta_p^2 = .01$ ; the CL approach group ( $M = 26.2$ ;  $SD = 3.0$ ) and the control group ( $M = 27.0$ ;  $SD = 3.4$ ) were not statistically different in their verb test scores. In contrast, the main effect of verb type was significant, Wilks' Lambda = .35,  $F(2,77) = 72.32$ ,  $p < .0001$ ,  $\eta_p^2 = .65$ ; the scores for the verb *put* ( $M = 10.8$ ;  $SD = 1.9$ ) were significantly higher than those for the verbs *hold* ( $M = 7.9$ ;  $SD = 2.1$ ) and *run* ( $M = 7.9$ ;  $SD = 1.7$ )<sup>1</sup>.

The two-way interaction between group and verb type was also significant, Wilks' Lambda = .91,  $F(2,77) = 3.79$ ,  $p = .03$ ,  $\eta_p^2 = .09$ . A post-hoc analysis (i.e., Scheffé Test), however, showed that there were no statistically significant differences in the test score for each verb between the groups.

### IV. DISCUSSION

The results showed that FL learners demonstrated no observable advantages in learning English polysemous verbs in the CL approach. FL learners who referred to the text explaining the core and peripheral senses of the target verbs (*hold*, *put*, *run*) did not outperform those who took the test without such supplementary materials. This finding contradicts those of previous studies examining the effectiveness of the CL approach in learning grammatical or lexical items in an L2 or an FL; a majority of these studies showed the facilitative effects of the CL approach in SLA or FLL (e.g., Csábi, 2004; Verspoor & Lowie, 2003).

A potential reason for the discrepant finding may involve the nature of the target items in this study. The target items of this study were *familiar* polysemous verbs. The three verbs (*hold*, *put*, *run*) were chosen as the target items because the participants had had a substantial amount of exposure to these verbs and yet their knowledge was not sufficient to allow for proper use. To examine the possible facilitative effects of learning core senses, one group of learners was provided material explaining the core senses of each verb while taking the test designed to measure their

knowledge of the target verbs.

The distinctive feature of the target items of this study is their polysemous nature. The target verbs, *hold*, *put*, and *run* are polysemous, and the distinct senses (or meanings) of each verb are considered to be associated in such a way that the relationship among the senses can be described as core and peripheral (e.g., Lakoff, 1987). The distinct senses are seen to be associated through meaning chains, rather than related on the basis of one semantic or cognitive commonality (e.g., Gibbs & Matlock, 2001). This implies that the semantic relatedness of the distinct senses of each target verb may vary according to their mediating chains. The relationship between the senses sharing the same or similar mediating chains is relatively close, while that between those differing in the mediating chains can be quite remote. The “core and periphery” view explains this relationship (i.e., the semantic relatedness of senses) with respect to the distance from the core sense: the more distant from the core sense the peripheral senses are, the more remote their relationship is. This view appears to provide a plausible explanation as to why there was no observable effectiveness for the CL approach in this study.

The test items used in this study involved both the core and peripheral senses of three verbs; the test items for the peripheral senses were larger in number than those for the core senses. This arrangement was made to avoid potential ceiling effects, because the participants were expected to have been exposed to the target verbs quite often and thus to have a substantial knowledge of their common usage (i.e., the usage of the core senses). Nonetheless, it is possible that this concern may have led to a collection of peripheral senses that are quite remote from the core senses, with the result that the peripheral senses were too difficult to infer from the core senses. Such difficulty is reported in previous studies (e.g., Boers, 2000; Verspoor & Lowie, 2003).

Another potential reason for no observable effectiveness for the CL approach may relate to the learners’ L1 effects on conceptualization of the target items. At the time of this study, the participants had already studied English for six to eight years. They had been exposed to the target English verbs in various contexts, and it is quite plausible that they had already conceptualized usage of these verbs. As the test showed, however, they had not fully understood the proper usage. In particular, they had experienced difficulty in grasping usage of polysemous senses. This misconception appears to stem from cross-linguistic influence.

The verb *hold*, for example, has the core sense of “to take and keep something in one’s hand or arms” (Tanaka et al., 2007). Such a core sense can be seen in the sentences (a) to (c), although they differ from each other in subtlety. The Japanese translations of the verb, by contrast, are quite different in meaning: (a) to contain [hairu], (b) to keep someone in custody [kouryu-suru] and (c) not to be a heavy drinker [sake ga tsuyoku nai]:

- (a) This measuring cup **holds** ten ounces of liquid.
- (b) The police are **holding** the suspect for questioning.
- (c) I don’t **hold** liquor very well.

In these cases, the Japanese equivalents of the target verbs do not necessarily correspond to their English counterparts. Even the verbs representing the core senses can be translated into various Japanese verbs. This incommensurability between English and Japanese suggests that the differentiated senses represented by the English verbs play no role in Japanese and the coalescent concepts represented by the Japanese translations play no role in English. In other words, the Japanese translations do not help understand the commonality underlying the seemingly different meanings of the verb, but rather, it may hinder such understanding, resulting in incomprehension or misconceived knowledge<sup>2</sup>.

In order to modify such misconceived knowledge, one needs to radically restructure their prior knowledge. One needs to change the prior knowledge structure so that the conflicting concepts and prior knowledge coalesce in a coherent manner. This type of learning is called *conceptual change*, which is considered to be qualitatively different and cognitively more demanding than simply adding new information or enriching knowledge (Carey, 1991). Restructuring of prior knowledge, nevertheless, is hard to bring about. Research shows that misconceived knowledge in such areas as mathematics, science, and language (e.g., FL knowledge affected by the learner's L1) is often resistant to change and various forms of explicit teaching have failed to induce the "conceptual change" kind of learning (Sinatra & Pintrich, 2003). Thus, provided that the verb test requires the FL learners in this study to engage in restructuring their prior knowledge, it may be plausible that forthright explanation of core senses did not lead them to a cognitively deep understanding of semantic relatedness among polysemous senses of the target verbs. This might result in no observable advantage of learning the core and peripheral senses of polysemous verbs.

## V. CONCLUSION

This study highlighted no observable contribution of cognitive linguistic insights into vocabulary to FLL, which contradicted the findings of previous studies. Two potential reasons were proposed: the difficulty in learning the peripheral senses of a polysemous word, and L1 effects on conceptualization in FLL. Both reasons concern the possible influence of the learner's prior knowledge in learning the core and peripheral senses of English polysemous verbs, reflecting the difficulty in restructuring FL vocabulary knowledge. In other words, the results of this study suggest that explicitly explaining lexical knowledge that native speakers have implicitly acquired may not induce the "conceptual change" kind of learning by itself. One should be cautious, however; "conceptual change" is regarded as difficult to make. This study's findings do not necessarily negate the possibilities of CL approaches to other types of FLL, such as enriching vocabulary knowledge.

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## NOTES

1. The scores for the verb *put* were significantly higher than those for the verbs *hold* and *run*. This finding was not expected because the three verbs are equally high in frequency. There are, however, slight differences in frequency between *put*, and *hold* and *run* (see Appendix E). It is beyond the scope of this study to provide the reason for the unexpected result; such differences might have resulted in the higher mean score for *put*.
2. Because all the test items (i.e., English sentences containing the target verbs) in the verb test accompanied their Japanese translations, one could speculate that it might hinder the participants from learning common features underlying the peripheral senses (i.e., the seemingly different meanings) of each target verb. Instead of providing Japanese translations, giving rich context (e.g., several English sentences for each target verb) may have led the participants to a better understanding of the target verbs. In the same vein, the written material explaining the core and peripheral senses of each target verb might need to accompany illustrations or figures which facilitate learning.

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## Appendix A

### An Extract from the Verb Test

1.	The police are <b>holding</b> the suspect for questioning. (警察の尋問のために容疑者を拘留している。)
2.	<b>Hold</b> your hands off my car! (私の車に手を触れるな！)
3.	There is no <b>holding</b> her. (彼女は手に負えない。)
4.	I don't <b>hold</b> liquor very well. (私は酒があまり強くない。)
5.	She can <b>hold</b> her own against any of her co-workers in policy-making. (政策立案では、彼女はどの同僚にも引けをとらない。)
6.	This measuring cup <b>holds</b> ten ounces of liquid. (この計量カップには10オンスの液体が入る。)
7.	Always <b>hold</b> your driver's license on you. (運転免許証をいつも携帯するようにしなさい。)
8.	I broke up with her. But <b>hold</b> this to yourself. OK? (彼女とは別れた。でも、内緒にしておいて。)
9.	I'm wondering if your offer still <b>holds</b> . (君の申し出はまだ有効かな。)
10.	I <b>hold</b> my career because of a serious illness. (ひどい病気のため休職している。)
11.	She completely <b>held</b> the attention of the audience. (彼女は聴衆を完全に魅了していた。)
12.	You're going too fast. <b>Hold</b> the speed to sixty. (スピードを出しすぎているよ。速度は60キロでいこう。)
13.	They <b>hold</b> me responsible for it. (その責任は私にあると彼らは思っている。)
14.	He has <b>held</b> the office of governor for 16 years. (彼は16年間知事の職にある。)
15.	<b>Hold</b> yourself comfortable. (気楽にしてください。)

**Appendix B***TOEFL Scores for the CL Approach and the Control Group*

	CL Approach Group (N=36)				Control Group (N=44)			
	Listening	Grammar	Reading	TOTAL	Listening	Grammar	Reading	TOTAL
Mean	45.1	54.7	52.3	506.9	46.0	53.3	52.0	504.5
SD	4.5	5.1	4.4	37.4	4.0	4.4	3.5	29.0
Min	34.0	41.0	42.0	413.0	33.0	44.0	44.0	413.0
Max	52.0	63.0	62.0	567.0	52.0	63.0	58.0	547.0

**Appendix C***Vocabulary Size Test Scores for the CL Approach and the Control Group*

	Level	2,000	3,000	5,000	academic	10,000	TOTAL
CL Approach Group (N=36)	Mean	16.0	16.2	11.6	11.2	3.2	58.2
	SD	2.0	1.9	3.3	3.7	2.3	9.6
	Min	8.0	10.0	5.0	2.0	0.0	29.0
	Max	18.0	18.0	18.0	17.0	8.0	77.0
Control Group (N=44)	Mean	16.4	15.7	10.8	10.9	3.5	57.4
	SD	1.6	2.6	3.2	2.6	2.7	8.6
	Min	10.0	5.0	4.0	4.0	0.0	37.0
	Max	18.0	18.0	17.0	16.0	9.0	76.0

## Appendix D

### *An Extract from the Written Material that Explained the Core and Peripheral Senses of the Target Verbs*

hold には、「手でおさえておく」というコアの意味があり、鉛筆のように動かないものなら、「手で一時的に持つ」という意味になります。一方で、動きのあるもの場合は、「その動きを一時的に止める」という意味になります。Hold your fire! は「銃を撃っている行為を一時的に止める」ということから「撃ち方やめ!」という意味になります。Hold your tongue! (黙れ!) も舌の動きを一時的に止めれば、しゃべれないということから理解できます。Hold it は熟語で「止まれ」の意味ですが、it が具体的なものを指す場合、「それを手にしてしばらく待っておけ」という意味にもなります。

hold は目に見えるもの以外にもよく使います。hold an idea だと「考えをいだく」、hold a meeting だと「会議を開催する」の意味ですが、「一時的におさえておく」ということから、「考え」なら「今いただいている」という感じが、「会議」なら「特定の目的のために場をおさえ、開催する」という感じがでできます。

hold から生まれた名詞 holder は、a record holder (記録保持者) のように「何かを持つ人」という意味と、a penholder (ペン立て) のように「何かを支えるもの」の意味があります。

## Appendix E

### *Frequency Scores for the Target Verbs*

	Brown Freq.	K-F Freq.	T-L Freq.	JACET 8000
hold	18	169	837	256 (n/v)
put	158	437	2,896	131 (v)
run	22	212	1,643	211 (n/v)

*Note.* Brown Frq.: Brown verbal frequency; K-F.Frq.: Kucera-Francis written frequency; T-L Frq.: Thorndike-Lorge written frequency. The numbers in JACET8000 represent ranking, instead of frequency.