Examining the Effectiveness of Dictionary Instruction on Meaning Determination of Polysemous Words

Osamu Matsumoto
Waseda University
e-mail: matsumoto036@icloud.com

Abstract

This study investigates the effects of dictionary use instruction on meaning determination of polysemous words among beginner-level Japanese (L1) learners of English as a foreign language (L2), or more specifically, its effects on selecting an appropriate L1 equivalent for an L2 polysemous word from the multiple meanings provided by a bilingual dictionary. Eighteen Japanese high school students participated and were divided into two groups based on the presence or absence of dictionary instruction in a reading comprehension class. Dictionary instruction was conducted so as to increase linguistic and dictionary-specific knowledge and raise awareness of surrounding contexts of words in the text. The quantitative analysis of the pre- and post-tests revealed that the group with dictionary instruction considerably improved in locating an appropriate L1 equivalent within the entry for a polysemous word. In addition, after dictionary instruction, participants were more likely to pay careful attention to known or familiar words when they appeared in a syntactically and/or semantically unfamiliar way. These findings indicate that, even though dictionary instruction was conducted for a relatively short period, it greatly contributed to the development of learners' ability to determine meanings of polysemous words with or without dictionary consultation.
Keywords: dictionary instruction; dictionary use; polysemous word; meaning determination

1 Introduction

Dictionaries help and promote language learning both in and outside of the classroom, providing a range of information in addition to the meanings of words. In spite of this usefulness, the instruction on dictionary use is not given much attention or likely even ignored in language classes (Wingate 2004); many researchers have insisted that dictionary training should be included in classroom activities (e.g. Chan 2014; Nesi 2002). Research has yet to reveal how and to what extent formal dictionary instruction improves dictionary consultation skills. The focal aim of this study is to investigate the effects of dictionary instruction on L2 learners' skill acquisition for meaning determination of words while reading. For this aim, polysemous words were targeted because they are highly likely to be great obstacles in dictionary use for L2 learners as found in Liou's (2000) and Wingate's (2004) studies.

The majority of research on dictionary use has concerned itself with how L2 learners look up unfamiliar words in the dictionary (e.g. Hulstijn 1993). This is because in general L2 learners consult a dictionary when they encounter unfamiliar or uncertain words (Scholfield 1999). Not using a dictionary, however, may guarantee L2 learners having sufficient knowledge of a word because they may only know its core meaning or partial usage. As Chan (2012) pointed out, dictionary consultation is not restricted to unfamiliar or unknown words. Yet, there are potential methodological

problems when researchers attempt to examine L2 learners' behaviours towards familiar or known words while reading if learners employ such strategies as skipping or ignoring, which are primarily unobservable. Considering this, the second objective of the study is to explore L2 leaners' behaviours towards words of which they know at least one L1 equivalent, with a focus on dictionary use.

2 Methodology

2.1 Participants

The participants were eighteen Japanese high school first year students who had learned English as a foreign language for approximately three years, their age ranging from 15 to 16, at the time of data collection. Their English proficiency levels were lower- to upper-beginner at best.

2.2 Procedure

The study employed a pre- and post-test design in order to examine the effects of instruction on L2 learners' meaning determination of a word in the dictionary, more specifically, on their skill acquisition of finding an appropriate L1 equivalent of an L2 polysemous word in a bilingual dictionary while reading. The study was conducted during the summer vacation in 2015, when a five-day summer school was held for the students. Eighteen students volunteered to participate in the study and were allowed to choose either a reading comprehension class with instruction on dictionary use (hereafter, DI group), or one without such instruction (hereafter, NoDI group). As a result, eight students chose the former class; the rest of the students (n = 10) took a normal reading comprehension class.

2.3 Pre-test and Post-test

In order to examine the participants' dictionary use and skills, the pre-test was assessed towards the participants one week before the first day of the five-day summer school. The pre-test included 14 underlined target words (for detailed explanation, see the next section). The text was 300 words long and carefully selected not to be too linguistically and lexically demanding to the participants. The topic of the text was general in order not to necessitate specific background knowledge to comprehend. The participants were required to provide an appropriate L1 equivalent for each target word while reading, regardless of whether or not they had confidence in their answers. They were free to answer either with or without a dictionary for each item. However, if they used a dictionary, they were asked to draw a circle around any words in the text for which the dictionary was used. They were allotted a maximum of 20 minutes, which were supposed to be enough for the participants to complete the test concerning the text length and difficulty, and task requirements.

The post-test was administrated on the same day as the last lesson of the five-day summer school, with the same target words, text and procedure as pre-test in order to identify whether dictionary instruction affected the participants' dictionary use.

2.4 Target Words

All the target words were polysemous, with or without multiple parts of speech, and appeared in the 300-word text used for the pre- and post-tests. They consisted of two types of words: *unknown* and *known*. In this study the former was defined as a word for which the participants could not come up with any L1 equivalent; the latter was defined as a word for which they knew at least one L1 equivalent.

Target known words were selected to match the following criteria: first, the words must be either those which are usually learned in class and quite often appear in textbooks[1] at the junior high school level, or those which are commonly used in the participants' L1 (i.e. Japanese) as loanwords (called *Katakana*) originally derived from foreign languages (English, in this study) and assimilated into Japanese[2]. Second, the words must be used in ways unfamiliar to the participants in terms of syntactic categories (e.g. parts of speech, transitivity of verb) and/or meanings. This was done so that participants would likely need to consult a dictionary or guess an appropriate meaning which would fit the context in order to successfully perform task requirements in the pre- and post-tests. The second criterion was crucial in the design of the study in order to determine whether learners produced appropriate L1 equivalents by paying attention to surrounding syntactic and/or semantic contexts for target words that they already had some knowledge of.

The procedure of screening the target words had two phases. First, based on the above criteria, twenty words were preliminarily selected from the text as candidates for known and unknown words (ten each). These words were further winnowed down; one month before the pre-test, the twenty-word list was given to the participants with blank brackets next to each word. Then they were asked to fill the brackets with an L1 equivalent which they first came up with for each word. Dictionary use was not allowed. As a result, among the ten candidate known words, seven words were answered with similar L1 equivalents (there were minor variations that did not make a serious difference in syntactic and/or semantic features in Japanese). On the other hand, as for the candidate unknown words, five out of eighteen students could give answers (i.e. L1 equivalents) to either one or two candidate unknown words. Answered items were overlapped and their L1 equivalents corresponded well. Lastly, in order to be balanced with the number of the target known words, one item was eliminated from the eight unanswered unknown words. Accordingly, there were fourteen words left in total as target unknown/known words that were then used on the pre- and post-tests (seven each).

2.5 Dictionary

Prior to the pre-test, all the students were asked to report the type and name of dictionary that they used for reading English texts. It was found that all the students ($N = 18$) indicated that they used an electronic handheld, bilingual dictionary inside and outside classroom. Furthermore, all of them named Taishukan's *Genius English-Japanese Dictionary* (hereafter Genius), which is one of the best-selling learners' dictionary of English for receptive use (i.e. from L2 to L1 translation). Thus the unity among dictionaries used was achieved without any experimental control, though the difference between paper-based and electronic dictionaries was out of focus from the beginning. The dictionary information was principally used for analyzing their answers by tracing where they located L1 equivalents of the target words in the dictionary.

2.6 Dictionary Instruction

Both test groups were common in that every class lasted fifty minutes. For the DI group, a 20-minute instruction on dictionary use was given in the early part of each lesson, which amounted to 100 minutes in total during the five-day summer school. 100-minute, however, seemed too short to master the whole spectrum of dictionary use, so instruction was limited to basic skills crucial for

[1] Japanese has a large number of loanwords from English while they may receive various modifications, phonologically, syntactically, morphologically or semantically to a different degree, when incorporated into Japanese, to say nothing of orthographical change (Japanese do not use the alphabetical system of writing).
[2] In Japan, essentially textbooks must be authorized by government and approved by the national ministry of education before they are used in class at elementary and secondary schools although each school has freedom of choice of textbooks.

meaning determination by dictionary consultation, or more specifically, locating an appropriate L1 equivalent of an L2 word in the dictionary. In order to allow learners to properly and efficiently search for an L1 equivalent, the instruction aimed to expand two main categories of knowledge: linguistic knowledge and dictionary-specific knowledge. Linguistic knowledge was further broken down into two subcategories: syntactic and morphological knowledge. The former focused on the features of parts of speech, and differences between transitive and intransitive; the latter mainly covered the system of word inflection in English. In contrast, dictionary-specific knowledge in this study focused on the internal structure of the entry. Taishukan's Genius is a conventional dictionary with the following principles:

- having different entries for homonyms,
- having multiple parts of speech within the entry,
- prioritizing high-frequency over lower frequency senses and usages.

The instruction included follow-up practices with illustrative examples, the aim of which was to raise the participants' awareness of the surrounding semantic and syntactic context of a word that they intended to look up in the dictionary.

3 Results and Discussion

The results of the meaning determination task are presented separately for unknown and known words in order to clearly analyze the participants' dictionary consultation skills and the effects of dictionary instruction on them. The results of the pre- and post-tests towards unknown words are shown first, followed by those of the known words.

3.1 Unknown words

Table 1 presents the mean pre- and post-test scores, look-up frequency, and successful look-up rates.

Group	Pre-test			Post-test		
	Mean test score (max = 7)	Mean look-up frequency (max = 7)	Mean successful look-up rate	Mean test score (max = 7)	Mean look-up frequency (max = 7)	Mean successful look-up rate
DI (n = 8)	4.3	6.8	63%	5.9	6.6	81%
NoDI (n = 10)	4.4	6.7	66%	4.5	6.4	68%

Table 1: The Results of the Pre- and Post-Tests for Unknown Words

The results of the pre-tests between the two groups indicate that there were similarities in overall task performances (i.e. mean test score, look-up frequency and successful look-up rate). Moreover, their high mean look-up fluencies imply that the target unknown words were still unknown to the majority of the participants as observed one month before the pre-test. Over 90% of the target unknown words in the pre-test were looked up in the dictionary (the mean look-up rate: 6.8/7 for the DI = 97%; 6.7/7 for the NoDI = 96%) while the mean successful look-ups give evidence that approximately one-third of the participants did not successfully determine the meanings of the target unknown words; many students had problems in disambiguating the polysemy of a word even with a dictionary before the five-day session started. As for the post-test, the look-up frequency was high and almost similar between and within the groups. This indicates that during the period between the pre- and post-tests

the majority of participants did not learn the meanings of the target unknown words. However, a large difference was identified in the mean successful look-up rates; the two groups showed different performances in the post-test from those identified in the pre-test. The DI group remarkably improved the success rate for the unknown words while the NoDI group did not show salient increase. This implies dictionary instruction lead to greater success in determining word meanings. Further investigation of answers in the post-test of the NoDI group revealed that they were likely to select L1 equivalents from meanings listed in the first or second position of the entry. This may suggest that they superficially searched the word meaning in the dictionary and stopped searching by selecting a L1 equivalent appearing in the very upper part of the entry. These findings are in line with past studies (e.g. Tono 1984; Bogaards 1998).

3.2 Known words

Table 2 provides the mean pre- and post-test scores, look-up frequency, and successful look-up rates

Group	Pre-test			Post-test		
	Mean test score (max = 7)	Mean look-up frequency (max = 7)	Mean successful look-up rate	Mean test score (max = 7)	Mean look-up frequency (max = 7)	Mean successful look-up rate
DI (n = 8)	2.1	0.4	48%	4.8	2.8	73%
NoDI (n = 10)	2.3	0.5	44%	2.5	0.4	54%

Table 2: The Results of the Pre- and Post-Tests for Known Words

The results of the pre-tests indicate that there were no clear differences in task performance in terms of the mean test scores, look-up frequency, and successful look-up rates between two groups. As expected, the target known words were far less frequently consulted than those unknown (the mean look-up rate: 0.4/7 for the DI = 6%; 0.5/7 for the NoDI = 7%). However, the mean test score of the pre-test was also low for the participants regardless of high familiarity of the word; the majority of the participants did not provide appropriate L1 equivalents to the target known words. The results were not very favourable when words were looked up in the dictionary; the successful look-up rates were even lower than those of the target unknown words (cf. Table 1). By further investigation of their answers in the pre-test, it was found that most L1 equivalents that the majority of the participants gave to the target known words corresponded to ones that they had answered when the word-list were shown in the screening process; they were L1 equivalents possibly learned at junior high school and/or used in Japanese as loanwords. From this, it is assumed that participants thought that meanings of the target known words were very familiar, and accordingly did not see the necessity of dictionary use. However, the target known words were selected to be unfamiliar to the participants in terms of syntactic and/or semantic features. Considering all the statistical evidence in the pre-test, when they came across these words, most participants did not consult a dictionary and answered their familiar L1 equivalents. They relied on their first L1 word association with the target known words, and did not pay enough attention to context to disambiguate polysemous words.

In contrast, the results of the post-tests presents clear differences between two groups. The NoDI group gave similar performances between the pre- and post-tests. On the other hand, the DI group had a distincitve increase in the post-test overall. The large increase of the DI groups' look-up frequency in the post-test may suggest that members of the DI group paid more attention to surrounding contexts and realized the L1 equivalent that they knew and first associated with did not

fit the context, and subsequently attempted to search a more proper L1 equivalent in the dictionary. Further possible explanation is that members of the DI group verified their answers (i.e. L1 equivalents) by checking whether they were listed within the entry in the dictionary, a strategy employed by more skillful L2 learners (e.g. Okuyama & Igarashi 2007). On the other hand, the NoDi group showed no clear differences in the mean scores and successful look-up rates between the pre- and post-tests. As for wrong answers provided without dictionary use, their post-test papers showed the evidence that they made mistakes in determining parts of speech and made confusion over whether verbs were transitive or intransitive.

4 Conclusion

The primary aim of the study was to investigate the effects of dictionary instruction on beginner-level Japanese L2 learners' meaning determination of polysemous words in the dictionary while reading. The participants receiving dictionary instruction in reading class considerably improved dictionary consultation skills in that they highly increased the accuracy of providing L1 equivalents to unknown words in the text. Those students receiving a regular reading comprehension class did not show such improvement. The study also attempted to capture L2 learners' behaviour towards known words and revealed that they did not necessarily determine the contextually correct meanings of known words. However, dictionary instruction was found to effectively improve the learners' processing of known words, possibly accomplishing this by raising their linguistic knowledge and awareness of context.

5 References

Bogaards, P. (1998). Using dictionaries: Which words are looked up by foreign language learners? In B. T. S. Atkins & K. Varantola (eds.), *Studies of dictionary use by language learners and translators* (pp. 151–157). Tubingen, Germany: Niemeyer.

Chan, A.Y.W. (2012). The use of a monolingual dictionary for meaning determination by advanced Cantonese ESL learners in Hong Kong. In Applied Linguistics, 33(2), pp. 115-140.

Chan, A.Y.W. (2014). How can ESL students make the best use of learners' dictionaries? In *English Today*, 30(3), pp. 33-37.

Hulstijn, J.H. (1993). When do foreign language readers look up the meaning of unfamiliar words? The influence of task and learner variables. In *The Modern Language Journal*, 77(2), pp. 139-147.

Liou, H. (2000). The electronic bilingual dictionary as a reading aid to EFL learners: Research findings and implications. In *Computer-Assisted Language Learning*, 13(4-5), pp. 467-476.

Nesi, H. & Haill, R (2002). A study of dictionary by international students as a British university. In *International Journal of Lexicography*, 15(4), pp. 277-305.

Okuyama, Y. & Igarashi, H. (2007). Think-aloud protocol on dictionary use by advanced learners of Japanese. In *The JALT CALL Journal*, 3(1-2), pp. 45-58.

Scholfield, P. (1999). Dictionary use in reception. In *International Journal of Lexicography*, 12(1), pp. 13-34.

Wingate, U. (2004). Dictionary use - the need to teach strategies. In *Language Learning Journal*, 29, pp. 5-11.