

# The Meaning Distributions of a Polysemous Word in Two Kinds of EFL Learning Materials

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## Abstract

EFL learners often show difficulty in attaining complete knowledge of polysemous words. For the acquisition of the complex meaning structure of polysemous words, literature has shown that focusing on the core meaning first and later learning other peripheral meanings is beneficial for learners. By focusing on a polysemous word, *take*, this paper investigated whether the two kinds of learning materials, graded readers and textbooks for junior high school students used in Japan, met the criteria above. With regard to the graded readers, it was found that easier materials tended to have fewer varieties of meanings and more occurrences of core meanings (Study 1). On the other hand, the textbooks tended to repeat the same expressions accompanying the word many times and the core meaning seldom occurred in them (Study 2). The difference may be caused by differences of the purposes and authorships between the two types of materials.

Acquiring English vocabulary is not an easy task for EFL learners. In the settings where English is seldom used for communicative purposes, it is difficult to learn a high number of words since the learners do not have an opportunity for natural acquisition of the vocabulary. Nation (2001) showed that educated L1 speakers of English know at least 17,000 word families and this number is often unrealistic as a goal for EFL learners. Thus, selection of the words to learn becomes important.

Out of this great number of words, it is not unusual to presume that learners should acquire

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basic words first. Basic words are usually used in high frequency and for expressing fundamental concepts, making knowledge of them crucial for English communication in general. However, a problem arises here. Since they are so frequent, many of them have multiple senses and learners have to know and recognize them in uttering and comprehending the language. Actually, the number of polysemous words is larger than that of words with a single meaning (Murphy, 2004). Furthermore, words used more frequently tend to have more meanings (Fenk-Oczlon, Fenk, & Faber, 2010). As such, it is highly probable that EFL learners who are beginners have difficulty coping with the polysemy of some basic words. To examine the learning environment for polysemy, this paper explored whether beginning learners of English are provided with opportunities to learn the polysemy of a word in EFL learning materials for beginners.

Previous research has shown that second language speakers and EFL learners seem to have difficulty attaining the complete knowledge of polysemous basic words. Schmitt (1998) investigated the knowledge of polysemous words of four post-graduate international students whose paper-based TOEFL scores were 530-567 in a longitudinal study with interviews. Although they were thought to be advanced non-native speakers of English who succeeded in entering British postgraduate programs, on an average, they did not know more than half of the meanings of 11 polysemous words from the University Word List in the study spanning across one and a half years. The study concluded that L2 learners may reach a plateau after the initial stage of acquiring multiple senses of words, and may not arrive at a complete attainment. Karlsson (2013) investigated the knowledge of 40 polysemous words with varying frequencies of 15 Swedish advanced speakers of L2 English through a multiple-choice test and found that they could get only a third of the full score on average. As such, polysemous words seem to be difficult even for advanced L2 speakers of English.

Considering this difficulty of acquiring the knowledge of polysemous words, what conditions should be met for learning them? First of all, the number of encounters plays a crucial role in acquiring any knowledge of words. For reading, it has been shown that learners may have to encounter a new word eight times to acquire its meaning (Horst, Cobb, & Meara, 1998). Webb (2007) suggested that they need 10 or more encounters, and less proficient learners may need more encounters (Zahar, Cobb, & Spada, 2001). At first glance, this may look applicable to polysemous words as well since, whether they are polysemous or not, encountering words a sufficient number of times is necessary.

However, dealing with multi-sense words needs to take another aspect into consideration. For example, if a word “XYZ” has three meanings, do learners have to encounter “XYZ” 10 times, or do they have to meet “XYZ” 30 times (10 times for each of the three senses)? In short, sense relations should be considered for polysemous words. Unfortunately, to our knowledge, little research has been done on exploring the relationship between the number of occurrences of the

senses regarding multi-sense words and the acquisition of their knowledge, except for Karlsson (2013), which suggested that the acquisition of a sense of a polysemous word is not affected by the overall frequency of the word.

Observing learner developments, however, some studies regarding the core meanings of polysemous words have shown insights on this aspect. The core meaning may not be the most frequent sense of a word, but it is the sense situated at the center of its semantic network. The other meanings of the word are thought to have extended from this core meaning. Crossley, Salsbury, and McNamara (2010) observed six adult L2 speakers of English for a year and found that they could only produce polysemous words with non-core senses after they could capture their core meanings. Watanabe (2013) indicated that learners had more difficulty guessing meanings of polysemous words that were less similar to their core meanings, when provided with the core meanings as cues. Nakahara (2005) and Rashidi (2013) showed that providing core senses was beneficial in teaching polysemous words for Japanese and Iranian EFL learners respectively. Verspoor and Lowie (2003) investigated the effectiveness of providing Dutch speakers of L2 English with cues of core meanings when learning polysemous words and found that they actually facilitated the learning of their non-core meanings. These past studies indicate that core meanings are acquired earlier, beneficial for teaching, and facilitate the acquisition of other meanings. Hence, it can be suggested that reading materials for beginners, which occupy the focus of this paper, should contain polysemous words that emphasize core, basic, and central meanings. In other words, materials for beginners do not have to use every sense of polysemous words equally. Peripheral senses do not necessarily have to appear in this beginning phase. As learners become more proficient, the materials should contain more peripheral meanings of polysemous words since learners are ready to acquire them. It is usually difficult to infer the peripheral meanings with the extension of the core meanings, so the peripheral meanings should appear after learners acquire core meanings.

As a trial of investigating the appropriateness of EFL learning materials for the acquisition of polysemous words, this paper explores the meaning distributions of a polysemous word, *take*, in two kinds of learning materials; graded readers from three different levels and junior high school textbooks published and used in Japan. *Take* is one of the verbs that has quite a lot of senses and frequently occurs in English learning materials for beginners. Norvig and Lakoff (1987) analyzed the differences of semantic elements among the senses of *take* and concluded that one of its senses, “grab,” is its core sense. Kim and Kim (2011) corroborated their suggestion by showing that non-native Korean speakers of English as well as English native speakers uttered sentences with the core sense, “grab,” the most frequently when they were asked to provide a sentence with *take*. This paper applied previous studies as above and the main sense 1: “lay hold of (something) with one’s hands; reach for and hold” of the Oxford Dictionary of English, which was used to classify the

meanings in our research, was chosen as the core of *take*.

The criteria for investigation of the two materials this paper explored were the distributions of the core and other senses of *take*. As suggested above, the core meaning should be more emphasized than the other peripheral meanings. Both materials should include a gradual increase of the types of meanings as learning progresses. After the initial stage, input of polysemous words with various meanings is shown to be effective (Crossley et al., 2010). Karlsson (2013) implied that the acquisition of the second or third sense of a polysemous word needs as much time as that of the first sense. Thus, increasing occurrences of them may be important for the acquisition of multi senses of the word. It should also be noted that there is a difference in the nature of learning between the uses of the two materials that were examined in this paper. Graded readers are usually read by learners themselves, so the selections of the senses of polysemous words are very important. Otherwise, learners will face difficulty in comprehending and acquiring their meanings since they usually cannot ask anyone clarificatory questions about them. On the other hand, textbooks are usually read with the explanations of teachers, so more varied meanings can be introduced. This difference was taken into account later in the analyses of the materials.

Summarizing the discussions above, we set three RQs for this paper as follows:

- 1) Do the two kinds of materials for learners, graded readers and junior high school textbooks of Japan, provide sufficient opportunities to acquire the core meaning of a polysemous word, *take*?
- 2) After the initial stage, do they accommodate more varied meanings of the word?
- 3) Are there any differences regarding RQs 1 and 2 above between the two kinds of materials, reflecting the different ways of usage?

Study 1 examines the relative frequencies of each sense of *take* in the three different-level graded readers, and Study 2 investigates these frequencies in junior high school textbooks published in Japan.

## Study 1

### Method

**Materials.** Three levels of graded readers were chosen for the purpose of this study. The assignment of levels was according to SSS (2008), a website guiding English learners for extensive reading, assigning the readability of a graded reader from Levels 0 to 6 (7 levels), Level 0 being the

easiest and Level 6 the most difficult. From its criterion, each graded reader of the levels is written within the following number of headwords:

- Level 0: 250 words or less
- Level 1: 500 words or less
- Level 2: 800 words or less
- Level 3: 1,300 words or less
- Level 4: 2,000 words or less
- Level 5: 2,800 words or less
- Level 6: 3,000 words and more

For the purpose of this study, which aims to follow the changes in frequencies of the senses in *take* with the changes across the difficulty levels of graded readers, those of the Level 0, Level 3, and Level 6 were chosen, which were assumed to be the easiest, intermediate and the most difficult ones among the graded readers respectively. Table 1 summarizes the series and levels of the graded readers analyzed in the study. *Cambridge Reading Starter*, *Macmillan Graded Readers*, *Oxford Bookworms*, and *Penguin Readers* were selected since they cover a wide range of levels. Their levels were assigned by the headwords the publishers set for each graded reader. For example, Macmillan “Elementary” series are shown to be written within 1,100 headwords, so were assigned as in Level 3 (1300 words or less). “Penguin Level 6” series are shown to be written within 3,000 headwords, and thus, were assigned as in Level 6 (3,000 words or more).

For Level 0 and Level 3, five books of each series available for the level were randomly selected. Three books were chosen for Level 6 since the tokens on average of Level 6 materials were about double those of Level 3. There were no Level 0 readers in Macmillan, and no Level 6 readers in Oxford Bookworms series.

**Table 1.**  
*Graded readers analyzed*

Levels in SSS (2008)	Cambridge	Macmillan	Oxford	Penguin
Level 0 (250 words or less)	Starter	—	Starter	Easystarts
Level 3 (1300 words or less)	Level 3	Elementary	Stage 3	Level 3
Level 6 (3000 words or more)	Level 6	Macmillan Literature Collection	—	Level 6

**Procedure.** Only the main texts were analyzed and the preface, colophon, notes, pre- and post-reading activities were excluded since it is assumed that not all of the learners read them. The targets and their contexts were extracted with the use of AntConc (Anthony, 2014) from the files, which were converted from the original books through scanning and text recognition by the software, Omnipage. The meaning of each *take* with the context was judged by four raters, who are highly proficient Japanese L2 speakers of English as well as English professors in Japanese universities, abiding by the definitions of the Oxford Dictionary of English (hereafter, ODE; Stevenson, 2010). Figure 1 shows a part of the entry for *take* in ODE. In this figure, 1 “Lay hold of (something) with one’s hands; reach for and hold” is a main sense, and main sense 1 (hereafter, M1) holds sub sense 1 (hereafter, S1), sub sense 1.1 (S1.1), a sub sense 1.2 (S1.2) and so on in its category, so a total occurrence of each sub sense in the same category is equivalent to the occurrence of the main sense. ODE lists nine main senses for *take* and most of them are further sorted into several sub senses (seen in Appendix A). As in the introduction section, S1 was treated as the core sense in this study. The raters assigned the meaning of *take* of each occurrence into one of the sub senses, a branch of a main sense, or a main sense itself if no sub sense was listed under it. Phrasal verbs were assigned into another category.

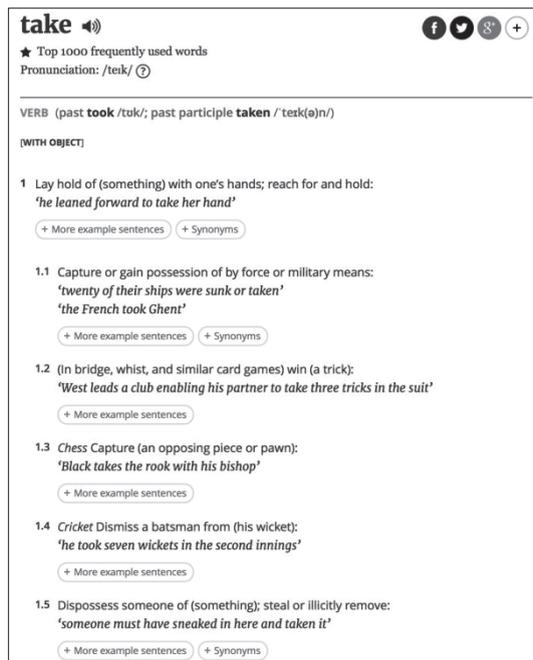


Figure 1. The entry of *take* in the Oxford Dictionary of English

All of the occurrences in the graded readers were divided into twelve sets and the occurrences of each set were categorized by the assigned two raters out of the four. For the occurrences whose categorizations the two raters could not agree about, the third rater made the final decisions. The inter-rater agreement ratio was at 83.87% for Level 0, 79.97% for Level 3, and 69.16% for Level 6.

**Results and Discussion.** Figure 2 summarizes the results for the main senses. M8 or M9 did not appear at all in the texts of all the three levels. M8 is “(of a plant or seed) take root or begin to grow; germinate” and M9 is “(Grammar) have or require as part of the appropriate construction,” so it is highly probable that the texts did not contain any contexts suitable for their occurrences. For the other senses, we can clearly see that the frequency distributions of the senses differ according to the level of graded readers. We will see the tendency of each level below.

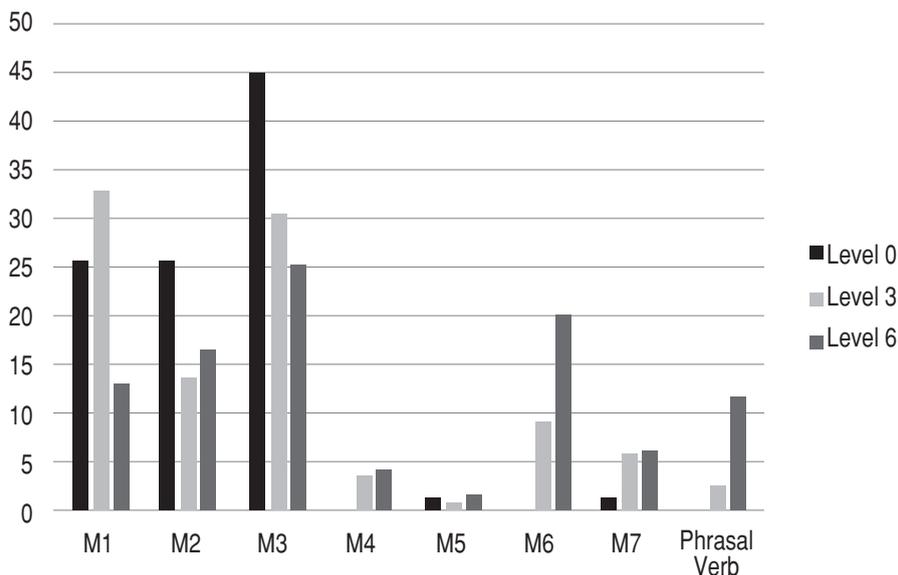


Figure 2. The main senses of *take* used in the graded readers

Looking into Level 0 which consists of the easiest graded readers by main sense group, the frequency ratio of M3 “carry or bring with one; convey” was the highest (45.16%), followed by M1 “lay hold of (something) with one’s hands; reach for and hold,” and M2 “remove (someone or something) from a particular place” (25.81%, respectively). A few cases of the other senses were also observed. Explored in detail with the sub senses as shown in Appendix, S3 turned out to be 25.81%, and S3a “accompany or guide (someone) to a specified place” accounted for 17.74%. Of the sub senses under M1, both S1 “lay hold of (something) with one’s hands; reach for and hold,” and S1.5 “dispossess someone of (something); steal or illicitly remove” were rather frequent (11.29%, each). M2 accounted for 25.81%, and no sub senses were observable in M2. In sum, *take* showed a

tendency to be used only for limited senses in Level 0.

In Level 3, which is the intermediate level, it was revealed that M1 (32.99%) and M3 (30.48%) appeared relatively frequently, followed by M2 (13.87%), M6 “make, undertake, or perform (an action or task)” (9.25%) and M7 “require or use up (a specified amount of time)” (5.82%) by the group. In terms of the sub senses, S1 “lay hold of (something) with one’s hands; reach for and hold” is used almost twice as frequently as in Level 0, and S1.5 “dispossess someone of (something); steal or illicitly remove” was identified fairly frequently (5.48%). Furthermore, *take* appeared more frequently in phrasal verbs than in Level 0. Of the sixteen phrasal verbs of *take*, there were 11 occurrences of *take something off*, and three occurrences of *take off*. In sum, more variety of senses appeared in Level 3 when compared to Level 0.

In Level 6, which consists of the most difficult graded readers in this study, M3 appeared most frequently (25.32%), followed by M6 (20.29%), M2 (16.72%), and M7 (6.49%). Whereas M1 and M3 accounted for over 60% of the total occurrences in Level 3, the main senses appeared more balanced in Level 6. Coded with the sub senses, S6 turned out to be 19.48%, and S3.1, 8.12%. In addition, the 73 uses of the phrasal verbs of *take* accounted for over 10% of the total frequency. Although *take something off* appeared 20 times, each of the other phrasal verbs appeared less than 10 times, which indicated that more kinds of the phrasal verbs with *take* were used in Level 6 than in Level 3.

The results show a clear tendency wherein the higher level materials contain more senses of *take* and more variety of phrasal verbs containing *take*. This looks good for learners since less proficient learners must have difficulty if *take* accompanied so many meanings as in Level 6 from the beginning. However, it should be noted as well that the frequency of the core meaning (S1) is lower than that of another sense in Level 0. As discussed in the introduction, acquiring core meanings facilitate the acquisition of multi meanings of polysemous words. Taking this discussion into account, graded readers may have to be more sensitive to the relative frequency of the core meaning. Primarily, though, the different patterns of *take* occurrences in the three different-level graded readers showed that they are compatible with learners’ development, indicating that the learners would not have much difficulty comprehending and acquiring the meanings of the polysemous word, *take*.

## Study 2

### Method

**Materials.** All of the English textbooks of junior high school for the year 2015 authorized by the Ministry of Education in Japan were used in this study. They are the first written systematic inputs for many of the students. The study consisted of six brands, and each brand had three books

for the three-years of junior high school education (Years 7 to 9). Thus, a total of 18 textbooks were investigated for the purposes of this study.

**Procedure.** Different from Study 1, all of the pages were included in the analysis except for the word index at the end of the books or the lists of new words usually at the bottom of pages, reflecting the assumption that the students usually use most of the textbooks with teacher instruction. Two raters, who engaged in the same task in Study 1, did the initial classifications and another rater judged if any disagreement occurred. The initial inter-rater agreement ratio was 97.7%. Other procedure was the same as in Study 1.

**Results and Discussion.** As in Study 1, the results were examined based on the grades of the students (Years 7 to 9) the textbooks were written for. Unlike the graded readers, the textbooks for the three grades did not look very different from each other. Throughout the years, M1, M3, and M6 are of the highest frequencies (see the details in Figure 3), although the number of sub senses appearing in the textbooks increase with the progress of learning; 13 senses in Year 7, 16 senses in Year 8, and 19 senses in Year 9 (see Table 2).

On analysis with the sub senses, it was found that the ratio of S1 (the core meaning) is less than 2% (see Appendix). On the contrary, the ratios of S1.15 “make (a photograph) with a camera,” S3.1 “accompany or guide (someone) to a specified place” and S3.3 “use as a route or a means of transport” are 20.9%, 12.3%, and 10.3% respectively. It should also be noted as well that about 36% of the occurrences in the first year are of S6.

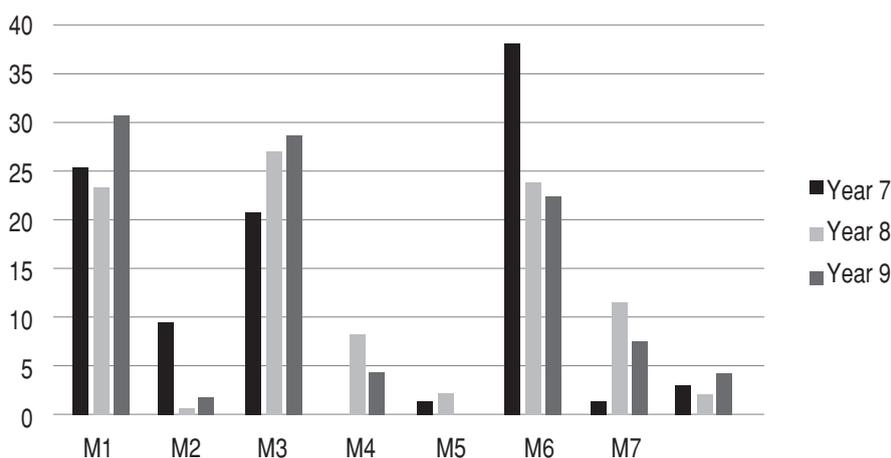


Figure 3. The percentage of the main senses of *take* used in the textbooks

**Table 2**

*Sub senses of take in the junior high school textbooks in each year*

Sub sense	Year 7		Year 8		Year 9		Total	
	freq	%	freq	%	freq	%	freq	%
S1	1	1.59	0	0.00	5	3.18	6	1.72
S1.6	0	0.00	0	0.00	3	1.91	3	0.86
S1.8	1	1.59	4	3.10	5	3.18	10	2.87
S1.14	0	0.00	1	0.78	1	0.64	2	0.57
S1.15	14	22.22	25	19.38	34	21.66	73	20.92
S2	6	9.52	1	0.78	3	1.91	10	2.87
S3	4	6.35	3	2.33	7	4.46	14	4.01
S3.1	5	7.94	20	15.50	18	11.46	43	12.32
S3.3	4	6.35	12	9.30	20	12.74	36	10.32
S4	0	0.00	7	5.43	5	3.18	12	3.44
S4.7	0	0.00	4	3.10	2	1.27	6	1.72
S5	1	1.59	3	2.33	0	0.00	4	1.15
S6	23	36.51	30	23.26	29	18.47	82	23.50
S6.2	1	1.59	1	0.78	6	3.82	8	2.29
S7	1	1.59	13	10.08	12	7.64	26	7.45
S7.3	0	0.00	2	1.55	0	0.00	2	0.57
take off 1	0	0.00	1	0.78	2	1.27	3	0.86
take part in 6	0	0.00	0	0.00	1	0.64	1	0.29
take sth down 2	0	0.00	0	0.00	1	0.64	1	0.29
take sth off 1	1	1.59	2	1.55	2	1.27	5	1.43
take sth over1	0	0.00	0	0.00	1	0.64	1	0.29
Others	1	1.59	0	0.00	0	0.00	1	0.29
Total	63		129		157		349	

The results show that the core meaning of *take* (S1) does not occur often in the junior high school textbooks. Taking the extremely low rate (1.72% on average) into account, it should be noted that this may cause the students to have difficulty attaining the core sense of *take*, and, in effect, its multi senses as well. Even though the number of the senses increases slightly throughout the years, the ratios of the senses look similar among the textbooks of the different grades. This can be interpreted as the textbooks are not carefully written or edited such that the learners can attain more meanings of *take* in later learning stages. Another aspect that might require some attention is that the three sub senses (S1.15, S3.1, and S3.3) are repeated quite a lot. This may also be counted as evidence that its meanings are not given as much close attention as its form when *take* is used. Furthermore, S6 is also the sub sense that stands out, and S6 functions as a light verb and does not have much meaning in itself. However, it did not provide a good opportunity to intake the usage of S6 through input from textbooks. As we can see from Table 3, most of the collocations in S6 are *take a bath*, *take care*, and *take care of*, and these three collocations account for almost 70% of the usage in S6. This suggests that many occurrences of S6 do not always contribute to the acquisition of various usages.

**Table 3**  
*Collocations of take in S6*

Collocations of take	Year 7		Year 8		Year 9		TOTAL	
	freq	%	freq	%	freq	%	freq	%
take action	0	0.00	1	3.33	3	10.34	4	4.88
take a bath	12	52.17	9	30.00	2	6.90	23	28.05
take a breath	0	0.00	0	0.00	1	3.45	1	1.22
take care	7	30.43	3	10.00	5	17.24	15	18.29
take care of	1	4.35	11	36.67	7	24.14	19	23.17
take courage	0	0.00	0	0.00	1	3.45	1	1.22
take guess	0	0.00	0	0.00	1	3.45	1	1.22
take a look	0	0.00	1	3.33	0	0.00	1	1.22
take a nap	0	0.00	1	3.33	0	0.00	1	1.22
take a note	0	0.00	1	3.33	0	0.00	1	1.22
take part in	0	0.00	1	3.33	2	6.90	3	3.66
take place	0	0.00	0	0.00	2	6.90	2	2.44

take a shower	1	4.35	0	0.00	0	0.00	1	1.22
take a step	0	0.00	0	0.00	1	3.45	1	1.22
take to flight	0	0.00	0	0.00	1	3.45	1	1.22
take a tour	0	0.00	0	0.00	1	3.45	1	1.22
take a trip	0	0.00	1	3.33	0	0.00	1	1.22
take a walk	2	8.70	1	3.33	2	6.90	5	6.10
Total	23		30		29		82	

### General Discussion

Study 1 shows that the graded readers increase the occurrences of more meanings of *take* with increasing levels, although the core meaning (S1) is not the most frequent one in the materials for beginners (Level 0). Contrastively, the uses of *take* in the junior high school textbooks do not change throughout the years of teaching. Besides, the frequency of the core meaning is extremely low. Summarizing these results, it is probable that the graded readers may be more carefully written than the junior high school textbooks for the step by step acquisition of the multi meanings of *take*. In the curriculum guidelines by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT, 2010) at the time when the textbooks were published, junior high school students in Japan were supposed to acquire around 1,200 headwords during the three years. Considering 1,300 headwords are used in Level 3 in the graded readers, it can be said that textbooks for Year 9 and Level 3 graded readers are almost comparable in terms of vocabulary. Comparing these two materials, the textbooks contain much smaller proportion of the core meaning.

In the introduction, the difference of the natures of graded readers and textbooks is described: the former are read by learners themselves and the latter are used with teachers. Thus, graded readers are supposed to be written such that the learners can acquire the meanings of words independently. Indeed, the number of meanings in Level 0 analyzed in Study 1 is quite small. This is reasonable in consideration of their nature. On the other hand, the textbooks analyzed in Study 2 do not seem to intend to facilitate learning the meanings of *take* in classroom settings. With the low rate of the core meaning, teachers will have difficulty explaining the complex structure of the meanings of the word since learners cannot have a clear image of the core sense without its occurrences in the textbooks. Besides, the repetitions of some of the meanings may ruin the opportunities of teachers for expanding the meaning structure of the word from the core meaning to peripheral meanings.

The repetitions may be related to the curriculum guidelines for secondary education (MEXT, 2010). It suggests that the words and expressions should be repeated over three years in order

to enable students to understand and use them in various situations. For example, S1.15, which constitutes 22.2% of the senses of *take*, is often used to introduce new grammar items and conduct activities in Years 8 and 9 textbooks. In the examples below, sentence (1) is intended to introduce the to-infinitive structure and sentence (2) is to practice with an auxiliary verb.

- (1) I visited Obihiro to take photos.
- (2) You must not take pictures here.

As such, the same expressions of *take* are repeatedly used not for the acquisition of the knowledge of the word itself. The writers seem to include familiar expressions repeatedly in order to focus on newly introduced grammar points and facilitate their acquisition. Thus, the repetitions themselves are sometimes inevitable.

However, it is difficult to justify all of the imbalanced repetitions with this reason. The authors of the textbooks may think that basic words such as *take* are acquired in the early stage of learning because of their frequencies. However, they are usually polysemous (Murphy, 2004; Fenk-Oczlon et al., 2010) and their meanings are more difficult to acquire than at first sight. Considering this, the repetitive uses of polysemous words need more thought: they need to include more expressions with core meanings; and more varied expressions with different meanings of such words should be included so that learners can deepen their knowledge of the words. Repetitive occurrences of the same collocations will not contribute to the understanding of the complex meaning structures of polysemous words.

The difference between the graded readers and the textbooks may be caused by their purposes as well. The former is for developing reading skills and the latter for developing the four skills (reading, listening, writing, and speaking) along with vocabulary and grammar. Thus, the same expressions may be repeatedly used so that the learners can use them in any of the mentioned skills. Even if the textbook writers think in this way, however, it should be reminded that the repetitions of the same expressions with the imbalanced frequencies of the senses should not take place as such. The expressions to be used by the learners need to focus more on the core meanings and more varied.

Another cause for the difference between the graded readers and the textbooks may be how the two kinds of materials for learners are written. It can be assumed that the former are written, or sometimes re-written from their original texts, by L1 speakers of English. Therefore, the occurrences of polysemous words may reflect their natural uses in L1 English. However, the latter are usually written by L2 speakers of English (L1 Japanese speakers) before they are checked by English native speakers. They must be aware that they need to use more frequent words in the

materials for beginners, but sense selections of them are possibly beyond their scope. Moreover, the possibility exists that they select the English words equivalent to the ones in their first language, or from their learning experience in the past with the textbooks also written by authors of the same L1. Thus, if the concept of the core meaning of a polysemous word is difficult to express in the L1, the core meaning has less opportunity for occurrence in the textbooks since the concept the core meaning embodies is not often directly retrieved in the writers' minds due to the difference in the structures of concepts between L1 and L2. This point is not easily resolvable in the current settings and, actually, there are many advantages of writings by the authors who have learned English as a second or a foreign language and know the difficulty peculiar to a certain L2 group. Thus, for now, it is important to keep in mind that the textbooks written by L2 speakers may contain the skewed proportions of the meanings of polysemous words. However, the removal of the skewed aspects may become possible by carefully looking into the texts before publishing.

The curriculum guideline by the government (MEXT, 2010) does not show which words or which meanings of a word should be learned. Therefore, the authors or editors of the textbooks select the words of their own accord. Although the selections of words are relatively easy to be judged by making their corpora, the meaning distributions are almost impossible with the number of people usually engaging in selecting the textbooks. In effect, the skewness observed in Study 2 may be left untouched.

At the same time, the textbooks may not neglect the polysemous aspect of words at all. One textbook analyzed in Study 2 introduces six polysemous basic verbs, *get*, *have*, *take*, *make*, *come*, and *go*, with some example sentences, pictures, and translation equivalents in Japanese as in Figure 4. Although the core meaning of *take* is not included in there, this reflects that the writers may be aware of the significance of polysemy. It is unfortunate, though, that the pattern of occurrences of a polysemous word, *take*, does not look appropriate for the acquisition of its multi meanings.

In line with the results of this paper, vocabulary of the English textbooks for secondary education has been debated at least for the past decade. Hasegawa, Chujo, and Nishigaki (2008) concluded that the combined vocabulary of junior high school and high school textbooks in Japan should include more practical vocabulary. Through the analysis with the BNC, Chujo (2004) found that a series of the textbooks for six-year secondary education in Japan lack 557 words out of the most frequent 3,000 words in the BNC. Sakata, Tagashira, and Mochizuki (2014) show that the words in English textbooks for high school analyzed by them did not reflect the frequency of a general corpus, COCA, and in effect, the university students who have completed the secondary education did not know many frequent and conceptually significant words. Koosha and Akbari (2010) found from the analysis of seven English textbooks for Iranian junior and senior high school students that the words in them covered only 15.4% of the BNC's first 3,000 words in terms of



Figure 4. Introduction of *take* in New Horizon 2 (p. 118)

word family. Alsaif and Milton (2012) examined all of the 22 English textbooks for EFL children at secondary school prescribed by the Ministry of Education in Saudi Arabia and found that only 2,800 out of the most frequent 5,000 words in RANGE appeared in the textbooks, whereas 1,000 words less frequent than those were used as well. These studies have shown that handling vocabulary properly in writing textbooks is not easy, probably due to the significantly large number of words that vocabulary comprises.

Although this study shows that there may be a problem surrounding polysemous words in some English textbooks written by L2 speakers of English, so far it has been difficult to come up with any systematic method to change the present system. Counting words themselves is relatively easy, compiling a corpus with technology. However, without the sort of laborious work that this paper has

adopted, it is impossible to count the numbers of all possible meanings for every polysemous word. Thus, to date, the writers of textbooks can do almost nothing except to keep in mind that they have to take care in the selection of meanings of polysemous words.

However, the graded readers are not without problems either. The distributions observed in Study 1 were relatively balanced, but the core meaning in Level 0 was not the most frequent. As Longman Dictionary of Contemporary English (Mayor, 2009), which lists the meanings in order of frequency, shows the meanings of S2 and S3 followed by S1, core meaning is not always most frequent. Hence, the higher frequency of S2 and S3 may reflect the general frequency of English use. However, if S1 occurs more, novice learners may pick up the core sense of *take* more easily. Introducing the core senses first and gradually increasing the occurrences of other meanings is an effective way already suggested (Verspoor & Lowie, 2003; Crossley et al., 2010; Nakahara, 2005; Rashidi, 2013) because second or foreign language learners of English have difficulty attaining multi senses of polysemous words (Schmitt, 1998; Karlsson, 2013). The two sorts of materials investigated in this paper have different characteristics in terms of the uses of a polysemous word. The graded readers seem to focus more on the core sense and other basic meanings of *take* than the junior high school textbooks. Additionally, the proportions of the meanings occurring in the latter materials do not seem to change with the learning stages. Summarizing the discussions above, the graded readers may be more appropriate for learning the complex structure of *take*, even though the purposes of the materials for English learning are not the same. The textbooks themselves may not be the best material for acquiring the complex structure of polysemy.

### **Pedagogical Implications**

The textbooks explored in Study 2 do not seem to take appropriate care for the acquisition of the polysemous nature of *take*. This should be addressed in the future, but it may be difficult to change this tendency immediately because of the L2 authorship issue mentioned above. A more realistic solution may be a combined method with graded readers. If the students read the graded readers with the textbooks, they may be able to take up the core as well as several other meanings of *take* since the readers may have more balanced occurrences of *take*. During reading the graded readers, some students may experience difficulty in understanding the meanings that do not appear frequently in the textbooks. Therefore, teachers may well introduce the meanings with those in the textbooks in class.

Apart from using graded readers, teachers can teach the structures of polysemous words with some cognitive method. Usually, the meanings of a polysemous word are interrelated with its core at the center. If the teachers can explain the relationships within the structures concisely, the learners will not face so much difficulty in attaining its multiple meanings. For this, teachers have

to know the internal structures of polysemous words clearly enough for teaching in advance. This also may utilize the advantage of teachers of secondary school who usually share the first language with learners and can explain rather complex concepts to learners, without imposing on them additional burdens related to the language difference. Teachers can also show learners the strategies for coping with polysemous words, such as the use of contexts and background knowledge in order to infer the meaning when they encounter a polysemous word, especially when they know part of its meaning, but not the meaning that suits the context. It has been shown that English teachers whose L1 is the same as that of the students are preferred in explaining difficult language components and understanding students' difficulties (Ma & Ping, 2012).

Looking back at the frequencies of Table 2, some sub senses exceed the number of 40. The results were of the six series of textbooks, thus 40 indicates that the sense occurred more than 10 times on average in the three-year learning period. This can be thought over a kind of the threshold for the meaning to be taken up if the criterion suggested by Horst et al. (1998) and Webb (2007) is adopted. Taking this into account, we can easily understand the necessity for drastically increasing the frequency of the core sense, S1, from the current six in total (appearing 1.0 times per series on average).

Lastly, some senses are not covered even with the graded readers. It is questionable if the students have to acquire all of the meanings of *take*, but it should be known that reading many materials may still leave learners unattained with regard to some of the meanings of a polysemous word.

### Conclusion

In this paper, the proportional frequencies of the senses of a polysemous word, *take*, in the two learning materials, graded readers and junior high school textbooks in Japan, were explored. In Study 1, it was shown that the graded readers were basically in line with the suggestions of the previous studies that the core meaning should be introduced first and more peripheral meanings should be used later. Those in Level 6 (of the most difficult level) have the most number of varieties in the meanings. On the other hand, the junior high school textbooks showed few evidences that they were written for the acquisition of the polysemy of *take* in Study 2. Its core meaning does not often appear in them and the repeated occurrences of the same expressions may harm the overall construction of the whole meaning structure of the polysemous word. The difference between the two kinds of learning materials may be caused by several reasons such as their different characteristics and authorships. The situation around *take* in the textbooks seems difficult to change with any immediacy, so teachers may have to complement with other materials such as graded readers to enhance the acquisition of the word. Otherwise, the beginning learners of junior high

school will fail to grab the core meanings of a basic word that appears highly frequently.

An obvious limitation of this paper is that we examined only one polysemous word, *take*, and did not study other polysemous words at all. The core meaning of *take* may be difficult for use in Japanese textbooks since there is no perfect equivalent for the word in the Japanese language. Thus, there are possibilities that the distributions of the meanings of other polysemous words are not similar to that of *take*. This should be explored in the near future so that a broader picture of polysemous word usage in the learning materials is captured.

Another limitation is the sample size of the graded readers in the current study. Although all of the junior high school textbooks were thoroughly investigated in Study 2, it was impossible to explore all the graded readers in Study 1. We only examined 44 graded readers in total out of a huge number of those available in the market. From the constraint of the research method that needs a high amount of manual work, it is unrealistic to expand this number in a drastic manner. However, it should be admitted that the results in Study 1 reflected a relatively small sample of the graded readers.

Learners' knowledge through the input of these materials can be a target for further research. As Schmitt (1998) and Karlsson (2013) suggested, L2 learners usually have difficulty attaining complete knowledge of polysemous words. Thus, how the materials interact with them should be known in order to find a solution to the situation.

Paying attention to the distributions of the meanings of polysemous words in learning materials is very important. Otherwise, the learners would have difficulty building up the whole structures of the words, or could attain only partial knowledge for each polysemous word. The two kinds of learning materials we explored in this paper were contrastive in the pattern of the occurrences of a basic, polysemous word, *take*. It should be kept in mind that the proportions of the meanings of polysemous words may not be carefully considered in learning materials. Selecting and combining them carefully for learners is definitely important.

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**Appendix**

Sub senses that appeared in graded readers and junior high school textbooks in Japan

Sub sense	Level 0		Level 3		Level 6		textbook		
	freq	%	freq	%	freq	%	freq	%	
S1	lay hold of (something) with one's hands; reach for and hold	7	11.29	129	22.09	47	7.63	6	1.72
S1.1	capture or gain possession of by force or military means	0	0.00	4	0.68	6	0.97	0	0.0
S1.5	dispossess someone of (something); steal or illicitly remove	7	11.29	32	5.48	11	1.79	0	0.0
S1.6	occupy (a place or position)	0	0.00	6	1.03	8	1.30	3	0.86
S1.7	rent (a house)	0	0.00	3	0.51	0	0.00	0	0.0
S1.8	agree to buy (an item)	0	0.00	1	0.17	1	0.16	10	2.87
S1.11	use as an instance or example in support of an argument	0	0.00	3	0.51	1	0.16	0	0.0
S1.14	write down	0	0.00	1	0.17	0	0.00	2	0.57
S1.15	make (a photograph) with a camera	2	3.23	13	2.23	7	1.14	73	20.92
S2	remove (someone or something) from a particular place	16	25.81	81	13.87	103	16.72	10	2.87
S3	carry or bring with one; convey	16	25.81	147	25.17	80	12.99	14	4.01
S3.1	accompany or guide (someone) to a specified place	11	17.74	18	3.08	50	8.12	43	12.32
S3.2	bring into a specified state	0	0.00	0	0.00	6	0.97	0	0.0
S3.3	use as a route or a means of transport	1	1.61	13	2.23	20	3.25	36	10.32

S4	accept or receive (someone or something)	0	0.00	13	2.23	12	1.95	12	3.44
S4.1	understand or accept as valid	0	0.00	0	0.00	7	1.14	0	0.0
S4.5	act on (an opportunity)	0	0.00	5	0.86	3	0.49	0	0.0
S4.7	react to or regard (news or an event) in a specified way	0	0.00	1	0.17	2	0.32	6	1.72
S4.8	deal with (a physical obstacle or course) in a specified way	0	0.00	1	0.17	0	0.00	0	0.0
S4.9	regard or view in a specified way	0	0.00	2	0.34	2	0.32	0	0.0
S4.10	be attracted or charmed by	0	0.00	0	0.00	1	0.16	0	0.0
S4.11	submit to, tolerate, or endure	0	0.00	1	0.17	0	0.00	0	0.0
S5	consume as food, drink, medicine, or drugs	1	1.61	6	1.03	11	1.79	4	1.15
S6	make, undertake, or perform (an action or task)	0	0.00	54	9.25	120	19.48	82	23.50
S6.1	conduct (a ceremony or gathering)	0	0.00	0	0.00	1	0.16	0	0.0
S6.2	be taught or examined in (a subject)	0	0.00	0	0.00	4	0.65	8	2.29
S7	require or use up (a specified amount of time)	1	1.61	33	5.65	37	6.01	26	7.45
S7.1	(of a task or situation) need or call for (a particular person or thing)	0	0.00	1	0.17	3	0.49	0	0.0
S7.3	wear or require (a particular size of garment or type of complementary article)	0	0.00	0	0.00	0	0.00	2	0.57
Others TOTAL	mainly phrasal verbs		0.00	16	2.74	73	11.85	12	3.44
計		62	100.00	584	100.00	616	100.00	349	100.0

Note. Categories of senses are based on Oxford Dictionary of English (ODE).