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Prefixes and Suffixes in Japanese Junior High School English Textbooks

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Abstract

This study aims to show the frequency of prefixes and suffixes in Japanese junior high school English textbooks and the frequency of prefixed and suffixed words in these textbooks. By comparing these frequencies with the Affix Levels, this study suggests which prefixes and suffixes need more input or instructions during teaching. The corpus consists of all the Japanese junior high school textbooks for all grades, and the frequency information regarding the prefixes and suffixes examined in the Affix Levels was extracted. The results show that types and tokens of both prefixes and suffixes in Japanese junior high school English textbooks are limited in number. This study suggests that textbooks alone may not be sufficient for learners to autonomously improve their knowledge of prefixes and suffixes. This study proposes that using other materials than textbooks, for example, graded readers, and instructions are necessary for learners to enhance their morphological knowledge.

Keywords: prefixes, suffixes, word family, textbooks

1. Introduction

Acquiring morphological knowledge is one of the essential keys to expanding learners' vocabulary. Learning this knowledge requires a massive amount of exposure to the target language, as well as systematic instructions; however, it is unclear how much input in the form of derived words Japanese junior high school students obtain from their textbooks. In this section, we first review research on derived words in textbooks. Then, we describe the Affix Levels, proposed by Bauer and Nation (1993). Finally, we present the aims of the current study.

1.1 Derived Words in Textbooks

Children learn a copious number of new words every year during elementary school. Some studies regarding children learning English as a first language show that from 60% to 80% of these new words are morphologically complex words (Anglin, 1993; Nagy & Anderson, 1984). Through exposure to these prefixed and suffixed words, children gradually acquire morphological knowledge.

Some studies have been conducted on vocabulary in Japanese junior high school English textbooks (cf. Chujo, 2004; Muraoka, 2010). However, no existing studies have examined prefixes and suffixes in the textbooks. Therefore, it is unclear how many derived words Japanese learners of English encounter during their junior high school years, which is important, considering that these textbooks are the primary source of English learning.

1.2 Affix Levels by Bauer and Nation (1993)

Bauer and Nation (1993) developed the Affix Levels mainly as a teaching and learning guideline for vocabulary. The following eight criteria, quoted from their study, were used to determine Affix Levels:

- Frequency
- Productivity
- Predictability
- Regularity of the written form of the base
- Regularity of the spoken form of the base
- Regularity of the spelling of the affix

- Regularity of the spoken form of the affix
- Regularity of function

There are seven affix levels (See Table 1 for descriptions and affixes). The description of each level indicates recognizable features of morphologically complex words.

Level	Description
	Affixes
1	Each form is a different word.
2	Inflectional suffixes
3	The most frequent and regular derivational affixes -able, -er, -ish, -ly [adv.], -ness, -th [ordinal number], -y [adj.], non-, un- [antonym], (all with restricted uses)
4	Frequent, orthographically regular affixes -al [adj.], -ation, -ess, -ful, -ism, ist, ity, ize, -ment, -ous, in-, (all with restricted uses)
5	Regular but infrequent affixes -age, -al [noun], -ally, -an, -ance, -ant, -ary, -atory, -dom, -eer, -en [adj.], -en [v], -ence, -ent, -ery, -ese, -esque, -ette, -hood, -i, -ian, -ite, -let, -ling, -ly [adj.], -most, -ory, -ship, -ward, -ways, -wise, ante-, anti-, arch-, bi-, circum-, counter-, en-, ex-, fore-, hyper-, inter-, mid-, mis-, neo-, post-, pro-, semi-, sub-, un- [reverse]
6	Frequent but irregular affixes -(ate+)-able, -ee, -ic, -ify, -ion, -ist, -ition, -ive, -th, -y[noun], pre-, re-
7	Classical roots and affixes

Note. Brackets [] after some affixes include the part-of-speech, meaning, or other information produced by attaching the affix.

Table 1: Affix Levels by Bauer and Nation

1.3 Aim of the Study

This study aims to show:

1. the frequency of prefixes and suffixes in textbooks

- the frequency of prefixed and suffixed words in textbooks

By comparing these frequencies with the Affix Levels proposed by Bauer and Nation (1993), this study suggests which prefixes and suffixes need more input or instructions during teaching.

2. Method

2.1 The Corpus

English textbooks used in Japanese junior high schools are approved by the Ministry of Education, Culture, and Technology (MEXT). These textbooks were made by six publishers for three grade levels for a total of 18 textbooks slated for use from 2016 to 2019. The corpus used in this study consists of all of these approved textbooks with 222,599 words.

2.2 Identifying Prefixes and Suffixes

Because this study compares prefixes and suffixes with the Affix Levels, only prefixes and suffixes that appeared in the Affix Levels were extracted from the corpus. To extract derived words with those target prefixes and suffixes, two methods were utilized.

The first method was to lemmatize derived words and identify the prefixes and suffixes attached to these derived words. Word lists based on The British National Corpus (BNC) and Corpus of Contemporary American English (COCA) referred to as BNC/COCA word family lists, which contain twenty-five 1,000-word family lists, were used as a database. The advantage of using this list is that the Affix Levels were used to create the word families in the lists. The lists arrange a lemma followed by their word family members. Most of the suffixed and prefixes were extracted by this method, but some of them could not be extracted because the lists treat some suffixed and prefixed words as lemmas.

The other method was to extract prefixes and suffixes of certain derived words from another database. MorphoQuantics, which contains 835 prefixes, suffixes, and combining forms based on Stein (2008), was used as the database (Laws and Ryder, 2014a; 2014b). This database lists derived words under the categories of prefixes and suffixes, so that it enables us to extract prefixes and suffixes. The advantage of this method is that it extracts all the affixed words thoroughly. On the other hand, this method extracts not only those words with an affix attached to a free base, but also those with an affix attached to a bound base, which were not included as affixes in the Affix Levels.

After making two lists using these two methods, the lists were compared, and overlapping words were identified as derived words with the targeted prefixes and suffixes. Then, two coders discussed and manually coded the remaining words from the lists according to whether the words were combinations of free bases and affixes with targeted prefixes and suffixes. Then, some words in the list were excluded because they appeared to be words with targeted prefixes and suffixes, but they were not. For instance, some words starting with re- were discarded. As Bauer and Nation (1993) stated, “[w]ords that will be wrongly

analyzed include *react, reagent, rebus, rebut, recap, recess, recite, recoil, recollect, recommend, record, recover, recur, redeem, redoubt, redress*, etc.” (p.279). In addition to these words, other words starting with re- were examined and excluded according to Marchand (1969).

Following Bauer and Nation (1983), only a combination involving a free base and affixes was included as a prefixed or suffixed word in the list. For example, -ent in *different* and -ence in *difference* were considered suffixed words because they were combinations of *differ* + *ent* and *differ* + *ence*. However, neither *convenient* nor *convenience* were considered suffixed words because the base, *conveni*, is a bound base.

After completing a list of prefixed and suffixed words, all targeted words were counted in the corpus. From these frequency counts, some of the word frequencies were subtracted. For example, *baker* is often used as a proper noun such as *Ms. Baker* and *Baker Street* in some textbooks.

3. Results

3.1 Types and Tokens of Prefixes

Table 2 displays the prefixes used in Japanese junior high school textbooks as well as those the textbooks do not use. For instance, un-, which is added to adjectives to form an antonym, has nine types in level 3, such as *unhappy* and *unfair*, with a total of 22 tokens in the corpus. For level 3 and 4, all the prefixes are found in the corpus. For level 5, only six out of 19 are found in the corpus. With these six prefixes, their types and/or tokens are limited in number. The two level 6 prefixes, re- and pre-, have some types, but not a high number.

Levels	Prefixes (Types:Tokens) used in textbooks
	Prefixes not used in the textbooks
3	non- (3:10), un- (9:22)
4	in- (6:18)
5	anti-(1:4), en- (3:26), fore- (1:3), inter- (4:93), mid- (3:13), semi-(1:1) ante-, arch-, bi-, circum-, counter-, ex-, hyper-, mis-, neo-, post-, pro-, sub-, un-
6	re- (3:31), pre- (2: 21)

Table 2: Prefixes in Textbooks

The results show that level 3 prefixes such as non- and un- do not appear frequently in the corpus. Moreover, within the textbooks, those suffixes tend to be used with certain bases. For example, as Figure 1 shows, un- is most frequently attached to *fair*. This is also true for other prefixes, such as *international* with inter- and *encourage* with en-. Additionally, certain prefixed words occur only in some textbooks. One of the reasons is that they are topic-related words. For example, one textbook, TOTAL ENGLISH for 2nd graders, contains a reading passage called “English for International Communication.” It is natural that *non-native* is used extensively in this section of the textbook. The other reason is that certain words are used for instructions or task titles. NEW CROWN, another

textbook used for all three grades, has a task titled *pre-listening*, so pre- shows as being used mainly in NEW CROWN.

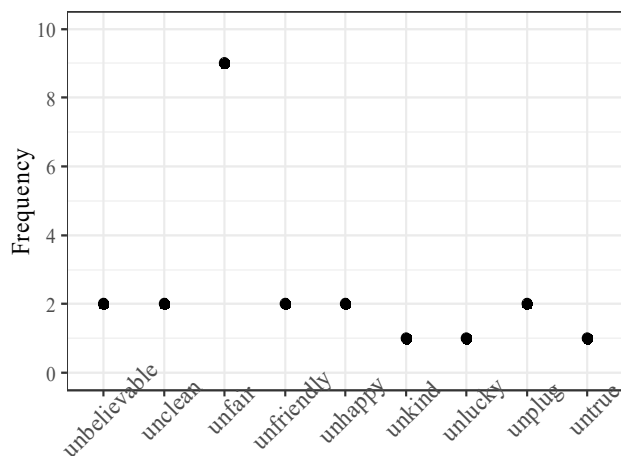


Figure 1: Frequency of suffixed words with un-

3.2 Types and Tokens of Suffixes

Table 3 shows suffixes used and not used in the textbooks. In addition to the prefixes used in the previous section, all level 3 and 4 suffixes are found in the corpus. Even at level 5, 19 suffixes out of 31 were used in the textbooks, and seven out of 10 were used at level 6.

Level	Suffixes (Types:Tokens) used in textbooks
	Suffixes not used in the textbooks
3	-able (6:13), -er (95:1085), -ish (6:61), -ly (63:716), -ness (15:47), -y (36:484)
4	-al (31:284), -ation (17:103), -ess (2:10), -ful (17:427), -ism (2:6), -ist (15:174), -ity (17:262), -ize (3:7), -ment (14:90), -ous (8:196)
5	-age (2:6), -al (4:9), -an (16:144), -ance (3:16), -ant (4:19), -ary (5:19), -dom (2:18), -en (4:6), -ence (4:32), -ent (1:91), -ery (7:46), -ese (4:423), -hood (2:5), -i (4:6), -ian (7:76), -ly (7:86), -ship (5:34), -ward (1:1), -wise (1:1) -ally, -atory, -eer, -en (adj), -esque, -ette, -ite, -let, -ling, -most, -ory, -ways
6	-ee (3:5), -ic (14:152), -ion (51:379), -ition (3:36), -ive (12:273), -th (9:75), -y (3:20) -(ate+)able, -ify, -ist,

Table 3: Suffixes in Textbooks

At level 3, -er, -ly, and -y were used frequently with varieties of bases, while the others were used frequently but with fewer bases—such as -ish and -ness—or not frequently used with a limited number of bases such as -able. For level 4, 5, and 6 suffixes, most of them were used with fewer bases, except for some suffixes, for example, -al at level 4 and -ion at level 6. Some of the suffixes are used much more frequently than prefixes, and with much more types of bases. The question is whether a certain textbook overly used a suffix and/or whether a certain word

with a particular suffix is predominately used. Table 4 displays the number of suffixed words with -er in each textbook for each grade. The chances of seeing a suffixed word with -er can be calculated by dividing the tokens by its types. The highest is TOTAL ENGLISH for 1st graders where the ratio is 5.13. The lowest is TOTAL ENGLISH for 3rd graders with 1.86. On average, the ratio is 2.58, so the reader encounters a type of suffixed word with -er fewer than three times during reading a textbook.

Textbooks	Grade		
	1st	2nd	3rd
COLUMBUS	11:38	15:34	17:42
NEW CROWN	18:59	34:81	49:103
NEW HORIZON	18:77	32:97	32:64
ONE WORLD	11:30	20:50	23:45
SUNSHINE	17:46	35:83	31:74
TOTAL ENGLISH	8:41	29:80	22:41

Table 4: Types:Tokens of -er suffixes

Figure 2 (on the next page) indicates the frequency of the 10 most frequent suffixed words with -er in each textbook. The three most frequent, *teacher*, *player*, and *singer*, are spread throughout all the textbooks for all grades. On the other hand, some, such as *cooker* and *wrestler*, are used only in a certain textbook for a certain grade. This is because these words are topic related. Due to a few highly frequent suffixed words and topic related suffixed words, it is more likely that most of suffixed words with -er can be seen once or twice during reading a textbook.

4. Discussion

The results of this study show that types and tokens of both prefixed and suffixed words in Japanese junior high school English textbooks are limited in number. There are three main reasons for this. First, textbooks include genre specific words and use them repeatedly. For example, among -er suffixed words, *teacher* is highly frequent and found in all textbooks for all grades. Second, topics in textbooks influence the selection of the words in the textbooks. These words include *non-native* and *wrestler*. Third, the number of types of words junior high school textbooks are required to use is 1,200, according to the Course of Study in Foreign Language Education requirements determined by MEXT. These 1,200 words include function words and monomorphemic words including frequent verbs and nouns. This has reduced the room for introducing morphologically complex words such as prefixed and suffixed words.

The types and tokens of prefixes are fewer than those of suffixes. One of the reasons is that the number of prefixes examined in Bauer and Nation (1993) are fewer than the suffixes. Moreover, some prefixes are less frequent in larger corpora than others. Table 5 shows the frequency obtained from iWeb, a 14-billion-word web corpus (Davies, 2018-). For the sake of our corpus search, only hyphenated prefixes such as non- and anti- were examined. A level 3 prefix, none-, clearly outnumbers level 5 prefixes anti-, pro-, ante-, post-. In particular, ante- has a much lower frequency with fewer types of bases than other level 5 prefixes. This is because the Affix Levels were determined

not only by their frequency, but also other factors including predictability and regularity. Those infrequent but valuable prefixes need explicit instruction.

	Tokens	Types
non-	2,654,606	11,326
anti-	947,400	11,053
pro-	231,238	2,018
ante-	3,260	218
post-	640,342	10,773

Table 5: Frequency of some prefixes from iWeb corpus

Some suffixes appear to be frequent and are used with varieties of bases; however, the textbook readers see most of those words with certain suffixes once or twice for three years. The instructors can use these chances to enhance affix knowledge; however, some low frequency suffixes, particularly those with higher levels such as -able, may need to be taught outside of textbooks.

Overall, Japanese English textbooks for junior high school alone may not provide sufficient input for autonomous learning of prefixes and suffixes due to the limited types and tokens of prefixes and suffixes. It is suggested that English instructors enhance input exposure to prefixes and suffixes by introducing graded readers or some other materials. Using instruction to teach prefixes and suffixes is also effective in increasing learners' morphological knowledge (cf. Bowers, Kirby, & Deacon, 2010).

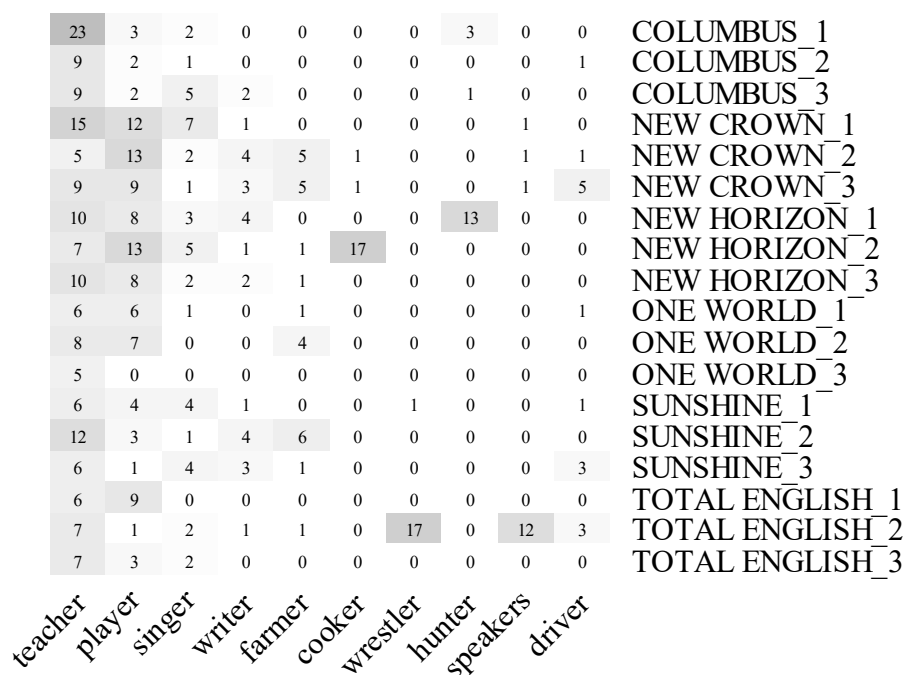
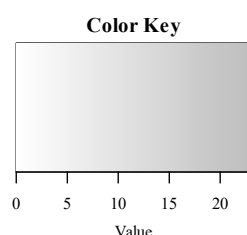


Figure 2: Frequency of suffixed words with -er

5. Conclusion

This study examined types and tokens of the prefixes and suffixes in Japanese junior high school English textbooks. The prefixes and suffixes are those that Bauer and Nation (1993) included in their Affix Levels. It also showed the frequency of derived words with prefixes and suffixes. The results indicated that the types and tokens of both prefixes and suffixes in the textbooks are limited in number. In addition to English textbooks, Japanese junior high school English classes should use other materials and instruction to enhance learners' morphological knowledge.

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