



# Comparing graded readers and authorized English language textbooks in junior and senior high schools : from the viewpoint of vocabulary and readability

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| 著者 (英)                       | Yuichiro Kobayashi, Kenji Kitao   |
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# Comparing Graded Readers and Authorized English Language Textbooks in Junior and Senior High Schools —From the Viewpoint of Vocabulary and Readability—

Yuichiro Kobayashi and Kenji Kitao

Non-native speakers of English have a much smaller vocabulary in English than native speakers do, and they also have difficulty of understanding complex sentences. For non-native speakers of English, readability and variety and levels of vocabulary are good indices for predicting difficulty levels of English passages. Therefore authorized English language textbooks in Japanese junior and senior high schools are controlled for vocabulary and readability. Graded readers, which are reading materials for non-native speakers of English from the beginners to the advanced learners, are also controlled with vocabulary and readability. This study measures readability and vocabulary levels of authorized English language textbooks and graded readers, level 1-6. From the results of their analyses, authors argue 1) English language textbooks are more difficult than the same level of graded readers. 2) In some cases, not enough of the vocabulary in graded readers is covered by the authorized textbooks. 3) Textbooks and graded readers share much of the same vocabulary. 4) Graded readers are well controlled for vocabulary but not for readability. 5) Though junior high students who have studied with English language textbooks may not be able to read the same level graded readers, high school students should be able to. These conclusions, based on a pilot study, are preliminary need further research.

## 1. Introduction

Readability and vocabulary are important factors in the level of difficulty that non-native speakers of English (NNSs) experience in reading English passages. NNSs have more trouble if the passage is more complicated, that is, the sentences are longer and longer words are used. Their vocabulary is not rich, and the number of familiar words is limited. Often, even if NNSs study English for a long time, their vocabulary is far below that of native speakers (NSs).

The average educated native speaker has a vocabulary size of around 17,000 word families (Goulden, Nation & Read 1990), and many adult foreign learners of English have a vocabulary size of considerably

fewer than 5,000 word families (Nation & Kyongho 1997). Nation (1993) argues that one word family is 1.6-2.0 words, that is, on average, a NSs' total vocabulary size is about 27,200-34,000 words and a NNSs' is less than 8,000-10,000 words, that is, NSs have a vocabulary more than 3.5 times larger than NNSs.

One solution is graded readers, which are books for NNSs that are classified based on their vocabulary levels and grammar items. Graded readers are extended texts, mostly fiction, written in language reduced in terms of structure and vocabulary (Hill 1997). They may be either simplifications of English books or books written specifically for NNSs. English language learners can choose the appropriate

level of reader based on their vocabulary levels. The vocabulary is well controlled and grammatical structures are simplified for lower levels. *Penguin Readers* use six levels, for example, and vocabulary is limited to 300 words for Level 1, 600 for Level 2, 1,200 for Level 3, 1,700 for Level 4, 2,300 for Level 5, and 3,000 for Level 6. Students can move up the levels as they improve their English. They are similar to readers for children, but the content is appropriate for adults rather than children.

**Table 1:** Headwords and Levels in *Penguin Readers*  
([http://www.eigostore.com/-c-10\\_1123.html?gclid=COPJy-DayZwCFRUwpAod3ygxKQ](http://www.eigostore.com/-c-10_1123.html?gclid=COPJy-DayZwCFRUwpAod3ygxKQ))

| Levels        | Headwords | TOEIC | STEP    |
|---------------|-----------|-------|---------|
| Easy-starters | 200       | 250   | 4       |
| Level 1       | 300       | 250   | 4       |
| Level 2       | 600       | 350   | 3       |
| Level 3       | 1200      | 400   | -2      |
| Level 4       | 1700      | 500   | 2       |
| Level 5       | 2300      | 600   | 2 or -1 |
| Level 6       | 3000      | 730   | -1      |

Japanese seventh, eighth, and ninth grade students have been studying English language in public junior high school since postwar education started. Most students start studying English language when they enter junior high school. Almost all Japanese students study it, since junior high school education is compulsory. English language is taught three hours a week, thirty-five weeks a year, that is, about 100 hours each year. In senior high schools, students choose how many hours they study English language, but most students study it. English language programs are strictly controlled by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) through the Course of Study, and all English language textbooks for junior high school students and senior high schools are authorized by MEXT (Kitao & Kitao, 1985).

The readability and vocabulary of authorized English language textbooks are well controlled. Government-authorized English language textbooks for junior high school students have only 100 essential words, which have to be included in one of the three

textbooks for seventh to ninth textbooks, and about 1,000 words in total are included. The words seem to be easy and are often used in communication and readings. Readability is well controlled, and sentences and words are short. At lower grades, this is particularly obvious. A lot of dialogues are used, particularly in the seventh grade textbooks.

Authorized senior high school English language textbooks vary a great deal, but about 2,000 to 3,000 words are included in English I (tenth grade), English II (eleventh grade), and Reading (eleventh and twelfth grades). Readability levels are much higher than those in junior high school textbooks, but they are still much lower than authentic English passages.

As for vocabulary levels, graded readers Level 1-3 are roughly parallel with junior high school English language textbooks, and graded readers Level 4-6 are parallel with senior high school textbooks. Their vocabulary is far more limited than authentic English passages. Students who have studied them are not ready to read authentic passages.

## 2. Review of Literature

### 2.1 Authorized English Textbooks

The contents of authorized textbooks for junior high schools and senior high schools are determined by the Course of Study, which has been revised almost every tenth year, and Isobe (2006) did a summary showing how the Course of Study and junior high school English textbooks had changed over the years. The range and the number of compulsory words since 1949 are shown in Table 2.

**Table 2:** Range of Words and No. of Compulsory Words

| Year (from) | range (no. of words) | compulsory (no. of words) |
|-------------|----------------------|---------------------------|
| 1949        | NA                   | NA                        |
| 1952        | 1200-2300            | NA                        |
| 1962        | 1100-1300            | 520                       |
| 1972        | 950-1100             | 610                       |
| 1981        | 950-1050             | 490                       |
| 1993        | More than 1000       | 507                       |
| 2002        | More than 900        | 100                       |

Isobe points out that the Course of Study from 1994 sets new words in senior high school English language textbooks at 1,900 words.

The Course of Study was a guideline until 1962, when it was made compulsory. Since 1952, both the number of words taught and the number of compulsory words have decreased, with the decrease being sharper for compulsory words. Thus students were required to learn fewer words, and there was less common ground in the words that students using different textbooks learned.

In a review of the Course of Study in the 1980s, 1990s, and 2000s, Hasegawa & Chujo (2004) considered the vocabulary used in junior high school English textbooks and showed that fewer words were being taught in junior and senior high schools in each decade. Looking at a series of junior high school textbooks, they found a reduction in both types and tokens in 2000s. In addition, in reviewing senior high school textbooks, they showed that students learned an insufficient number of vocabulary words for 95% coverage of any but texts for the purpose of survival English.

Nakamura (2008) compiled corpora from seven series of junior high school English textbooks, counted the types and tokens, calculated such statistics as the average number of words per sentence, and compared the seven series, based on their corpora. The results indicated that the seven series varied a great deal, based on average words per sentence, type/token ratios, and vocabulary.

Seya (2004) did a thorough analysis of seven series of junior high school English textbooks. He compiled corpora made up of all chapters and analyzed the vocabulary found in the textbooks by series, grade, and part of speech. Tokens found in each textbooks series ranged from 1189 to 1450. Seya found that 345 words (between 25 to 29%) were found in all seven series. Words used only once in one series ranged from 231 to 367 words (18 to 26%). Although Seya provides only the raw data, we interpret this to mean that junior high school English textbooks have

relatively few words, and different series of junior high school English textbooks have relatively few words in common.

Kitao & Tanaka (2009) analyzed seven series of junior high schools used from 2002 to 2005 academic years using corpora compiled by ELPA (Association for English Language Proficiency Assessment) which include only the main texts of each chapter.

They counted the types (unique words) in each textbook. The results are shown in Table 2.

Table 2: Types (unique words)

| Grade                            | Mean | SD | Min | Max |
|----------------------------------|------|----|-----|-----|
| 7 <sup>th</sup>                  | 310  | 18 | 271 | 321 |
| 8 <sup>th</sup>                  | 491  | 53 | 429 | 571 |
| 9 <sup>th</sup>                  | 557  | 56 | 454 | 628 |
| 7 <sup>th</sup> -9 <sup>th</sup> | 874  | 52 | 802 | 934 |

The table shows the mean number of types in each grade, that is, each word is counted only once, no matter how many times it occurs.

The seven series of textbooks included an average of 875 unique words for the three grades combined. This indicates that only 9 new words are taught per week. Students study relatively little vocabulary in junior high school English classes.

Yamazoe (2008) made corpora of thirty-five series of senior high school English textbooks and counted the number of types and tokens and calculated the average number of words per sentence, etc., and compared the thirty-five series using the method developed by Nakamura (2008). He argued that the number of words or sentences, which is the common determiner of difficulty levels of textbooks, is very different among the same size textbooks.

## 2.2 Graded Readers

There are inclusive survey reviews of graded readers presented by the Edinburgh Project on Extensive Reading (Hill 1997, 2001; Hill & Thomas 1988a, 1988b, 1989; Thomas & Hill 1993). They review

major series of graded readers, and their corpus includes not less than 164 series containing 3,182 titles (Hill 1997). However, it is probable that their corpus is not machine-readable, because Hill & Thomas (1988a, 1988b, 1989) do not present any quantitative data, other than some percentages.

The first group to construct the computerized corpus of graded readers was Nation and his colleagues (e.g. Claridge 2005; Nation & Wang 1999; Wodinsky & Nation 1988). From the viewpoint of vocabulary teaching, they referred to the necessity of computerized analysis of graded readers:

Computer analysis of the text would be needed to choose the words. If a novel was to be set text for a large number of learners or for several years, the small amount of cost and effort of scanning the text into the computer and running a simple word frequency programme over it would be well repaired (Hirsh & Nation 1992).

However, all their works except for Nation & Wang (1999) employed small corpora that contained only a few texts. In their epoch-making work, Nation & Wang examined the vocabulary learning possibilities and vocabulary load of graded readers using a corpus of 42 texts of *Oxford Bookworms Library*, but their analysis leaves much to be desired from the viewpoint of corpus linguistics on the grounds that it shows only tokens and types. Moreover, all the works of the group focus on *Oxford Bookworms Library*, and little attention has been given to the analysis of other graded readers, such as *Penguin Readers* or *Cambridge English Readers*.

Kobayashi (2006a) did a corpus-based analysis of the language of graded readers, and his findings were: (1) Learners cannot acquire all “headwords” of *Penguin Readers* by means of reading one text at each level, and they need to read at least two or three texts at each level in order to acquire all “headwords.” (2) At every level except for Level 6, the text coverage of *Penguin Readers* is not sufficient, being less than 95%, and *Penguin Readers* leaves much to be desired from the viewpoint of vocabulary acquisi-

tion. (3) The vocabulary control of *Penguin Readers* is based on *General Service List* (West 1953), and the size criticism of the list holds true for *Penguin Readers*.

Kobayashi (2006b) compared the original version and two simplified versions of *Jane Eyre*, which was the most popular material for graded readers<sup>1</sup>, and showed that, in simplified versions, vocabulary and syntax were strictly controlled and some tropes were carefully avoided.

### 3. Research Questions

The purpose of this study is to compare graded readers and Japanese English textbooks from the viewpoint of vocabulary and readability. Very few attempts have been made at such comparison, even though many researchers and teachers emphasize the importance of extensive reading (e.g. Bamford & Day 1998, 2004). Our research questions are:

- (1) Which words are included in each vocabulary level in graded readers and authorized textbooks? What is the relationship between those levels?
- (2) Do graded readers and authorized textbooks provide good conditions for spontaneous learning?
- (3) Which words are keywords which distinguish graded readers and authorized textbooks?
- (4) What is the relationship between the readability of graded readers and authorized textbooks?
- (5) Can students who have studied authorized textbooks read the same level of graded readers?

## 4. Data and Methodology

### 4.1 Data

Out of seven series, we have chosen three series of

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<sup>1</sup> According to Hill (2001), *Jane Eyre* is the most popular material for graded readers because the EPER (Edinburgh Project on Extensive Reading) database holds records of no less than 22 versions of it.

junior high school English language textbooks, *New Crown* (Sanseido), *New Horizon* (Tokyo Shoseki), and *Sunshine* (Kairyudo), since more than 95% of students have used one of those series.

There are too many series of authorized English language textbooks for senior high schools to analyze all of them, and curricula are complicated, so we have chosen the most common curriculum, that is, English I, English II, and reading for the tenth, eleventh, and twelfth grades. (Both English II and Reading are taught to eleventh and twelfth grades in many senior high schools; the former is more basic and the latter involves more application. It seems to be the trend to teach Reading after English II, so we have chosen eleventh grade English II and twelfth grade Reading for this study.)

We have chosen two high, intermediate, and low level English I and English II textbooks, and two high and low level Reading textbooks. We tried to choose textbooks from various publishers. For both junior and senior high school English textbooks, we used corpora compiled by ELPA (Association for English Language Proficiency Assessment) which include only the main texts of each chapter; we did not include the chapters which have only exercises.

We chose three graded readers from each of the six levels of *Penguin Readers*, the most classic and popular series of graded readers, at random. We used corpora made by Kobayashi (For further details of corpus construction, see Kobayashi 2006a).

Therefore we chose nine junior high school textbooks, sixteen senior high school textbooks (six English I, six English II and four Reading), and eigh-

teen graded readers.

## 4.2. Methodology

Using *Tests Document Readability And Improve It*, ([http://www.online-utility.org/english/readability\\_test\\_and\\_improve.jsp](http://www.online-utility.org/english/readability_test_and_improve.jsp)), we obtained basic descriptive data about each text, including the number of letters, tokens, and sentences; the average number of letters per word, syllables per word, and words per sentence; and readability (Flesch–Kincaid Grade Level). We used AntConc (<http://www.antlab.sci.waseda.ac.jp/software.html>) to obtain types.

We used Excel to calculate the Guiraud index, which can be calculated  $\text{types}/\sqrt{\text{tokens}}$ , since this index is less influenced by the size of corpora than TTR (type/token ratio). We lemmatized texts with TreeTagger (<http://www.ims.uni-stuttgart.de/projekte/corplex/TreeTagger/>) and then using AntConc, we calculated the number of words. We used Vocabulary Level Calculator (VLC) (<http://www.cis.doshisha.ac.jp/kkitao/library/resource/corpus/VLC.zip>) to calculate average level based on the eight levels of the JACET8000 word frequency list. We used Perl programs which we made to calculate the coverage of words in the text, and we used AntConc to analyze keywords.

## 5. Results and Discussion

### 5.1. Vocabulary Frequency

We have summarized the results of analyses of junior and senior high school English language textbooks in Appendix D. In order to see the differences among grades, we have summed up the above results by grades in Table 3.

Table 3: Results of Analyses of Junior and Senior High School English Language Textbooks

| grade | letters | tokens | types | lemmas | Guiraud index | sentences | letters/word | syllables/word | word/sentence | JACET 8000 |
|-------|---------|--------|-------|--------|---------------|-----------|--------------|----------------|---------------|------------|
| 7th   | 4659    | 1005   | 323   | 292    | 10.20         | 245       | 3.81         | 1.37           | 4.09          | 1.27       |
| 8th   | 7095    | 1759   | 523   | 452    | 12.50         | 314       | 4.04         | 1.39           | 5.64          | 1.24       |
| 9th   | 7480    | 1789   | 542   | 463    | 12.76         | 309       | 4.06         | 1.39           | 5.72          | 1.26       |
| 10th  | 28008   | 6446   | 1380  | 1104   | 17.16         | 609       | 4.32         | 1.42           | 10.42         | 1.30       |
| 11th  | 38954   | 9059   | 1789  | 1334   | 18.88         | 802       | 4.30         | 1.44           | 10.88         | 1.40       |
| 12th  | 63760   | 14558  | 2828  | 2293   | 23.51         | 1070      | 4.38         | 1.46           | 13.60         | 1.49       |

For all categories, the numbers go up as grades go up, with few exceptions. The number of sentences between the eighth grade and ninth grade are almost the same. The number of letters per word is almost the same between the tenth grade and eleventh grade. The average JACET8000 level does not have an upward trend in junior high.

The number in each item is very small for the seventh grade, and we understand that those items are strictly controlled for the seventh grade. There is a big gap between the seventh grade and eighth grade, and there is very little difference between the eighth grade and the ninth grade. The eighth grade should be controlled more strictly.

However, the gap between the ninth grade and the tenth grade is very large<sup>2</sup>. The differences among three grades in the senior high school are fairly large. Since almost all junior high school graduates go to senior high schools, the gap between junior high schools and senior high schools should be small and the change should be smoother. The index of JACET8000 is not necessarily good measurement of vocabulary difficulty levels for each grade, since the differences are so small.

We have summarized the results of analyses of graded readers in Appendix E. In order to see the differences among levels, we have summed up the above results by levels in Table 4.

Graded readers are well controlled based on difficulty and vocabulary. Except letters per word and syllables per word, their levels are well controlled, with the exception of the number of sentences in Level 3 and Level 4.

There is a large gap between Level 4 and Level 5. *Pride and Prejudice* in Level 5 is too difficult and this makes a relatively large gap between Level 4 and 5 and no gap between Level 5 and Level 6.

Figure 1 and Figure 2 summarize the growth of Guiraud index and one of JACET8000, respectively, in textbooks and graded readers.

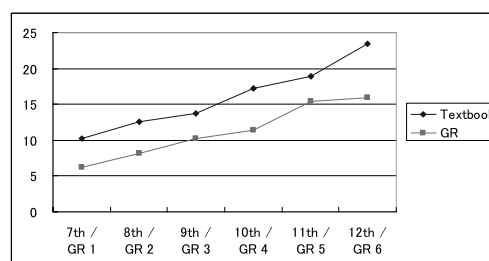


Figure 1: Guiraud index

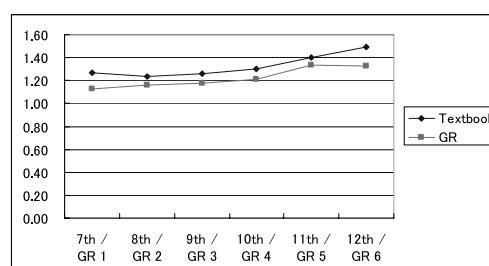


Figure 2: JACET8000

Table 4: Results of Analyses of Graded Readers

| level | letters | tokens | types | lemmas | Guiraud index | sentences | letters/word | syllables/word | word/sentence | JACET 8000 |
|-------|---------|--------|-------|--------|---------------|-----------|--------------|----------------|---------------|------------|
| GR 1  | 16010   | 4042   | 392   | 306    | 6.16          | 659       | 3.96         | 1.31           | 6.16          | 1.13       |
| GR 2  | 33291   | 8601   | 750   | 567    | 8.12          | 994       | 3.90         | 1.33           | 8.57          | 1.16       |
| GR 3  | 54562   | 13765  | 1193  | 901    | 10.25         | 1644      | 3.95         | 1.33           | 8.33          | 1.18       |
| GR 4  | 64991   | 16480  | 1474  | 1023   | 11.43         | 1553      | 3.95         | 1.35           | 10.95         | 1.21       |
| GR 5  | 114300  | 27338  | 2468  | 1887   | 15.37         | 1915      | 4.14         | 1.40           | 14.20         | 1.33       |
| GR 6  | 133764  | 32861  | 2900  | 2225   | 15.93         | 2638      | 4.07         | 1.37           | 12.72         | 1.33       |

<sup>2</sup> For an explanation of gaps between junior high school and senior high school, see Oikawa (2007).

Comparing six grades in textbooks and six levels in graded readers, textbooks seem to be more difficult than graded readers, based on the variety of words (Guiraud index) and JACET8000 level. Thus students who study with those textbooks can read same levels of graded readers in terms of vocabulary.

There seems to be gap between Level 3 and Level 4 in textbooks and Level 4 and Level 5 in graded readers.

## 5.2 Text Coverage

As has been shown in Section 5.1, students who study with those textbooks can read same levels of graded readers in terms of vocabulary. In this section, textbooks and graded readers will be compared in terms of text coverage.

It is useful to understand why text coverage of tokens is important. 80% coverage of a text means that one word in every five is unknown (about two words per line). 90% means one in every ten is unknown (about one word per line), and 95% coverage means one in every twenty is unknown (about one unknown word in every 50-100 running words) (Nation 2001).

Several researchers suggest that it is necessary to know about 95% of the vocabulary in a text in order to be able to guess unknown words from context (Liu and Nation 1985), or to comprehend the text (Laufer 1989).

Table 5 and Table 6 summarize the text coverage at each grade or level analyzed by Perl program developed by ourselves. It is calculated by the formula:  $(100 - \frac{\text{the sum of new words at that grade or level}}{\text{the tokens at that grade or level}} * 100)$ .

Table 5: Text Coverage in Authorized English Textbooks

| 7th | 8th  | 9th  | 10th | 11th | 12th |
|-----|------|------|------|------|------|
| 0.0 | 74.3 | 82.4 | 81.8 | 90.0 | 91.4 |

Table 6: Text Coverage in Graded Readers

| GR1 | GR2  | GR3  | GR4  | GR5  | GR6  |
|-----|------|------|------|------|------|
| 0.0 | 77.2 | 84.4 | 89.6 | 90.1 | 95.6 |

These tables show that percentages are almost directly proportional to grade or level, but all percentages except for one of Level 6 are not sufficient being below 95%. Needless to say, textbooks are compiled for the purpose of using in classroom teaching, and graded readers are also compiled for the purpose of making up for classroom teaching. Therefore, the insufficiency of the coverage may be not always crucial.

The next step is to compare between words in textbooks and those in graded readers. The result appears in Table 7. As for textbooks, the word list of a grade includes not only words of the grade but also those of all grades under the grade, because readers of textbooks of a grade have read all textbooks of grades under the grade.

Table 7: Authorized English Textbooks vs. Graded Readers

| 7th/<br>GR1 | 8th/<br>GR2 | 9th/<br>GR3 | 10th/<br>GR4 | 11th/<br>GR5 | 12th/<br>GR6 |
|-------------|-------------|-------------|--------------|--------------|--------------|
| 71.3        | 81.7        | 84.3        | 92.5         | 93.4         | 94.7         |

Table 7 shows that, although they are directly proportional to grade and level, all percentages are not sufficient being below 95%. Unlike the results in Section 5.1, this result may show that grade reading scheme leave much to be desired from the viewpoint of text coverage. However, since many graded readers are based on fictions or fairy tales, they include many proper nouns or words closely related to the plot. These words may have an influence on the inefficiency of the coverage. To shed a light on this point, keyword analysis will be the subject of the following section.

## 5.3 Keyword Analysis

Which words are keywords which distinguish graded readers and textbooks? In the field of corpus linguistics, keywords are those whose frequency is



unusually high in comparison with some norm. They are not usually the most frequent words in a text, rather they are the more “unusually frequent” (O’Keeffe, McCarthy & Carter 2007). Usually log-likelihood ratio test (Dunning 1993) is used to compare two word lists in order to derive keywords.

We have summarized the top 10 keywords in each level of graded readers in Appendix F. In the table, “LLR” stands for the log-likelihood ratio scores, and it means the degree of distinctiveness called “keyness”. When the keywords are derived, as for textbooks, the word list of a grade includes not only words of the grade but also those of all grades under the grade.

We see from Appendix F that most of the keywords in graded readers are proper nouns (e.g. Tom, Emma, Holmes). While these words are very common in graded readers, they do not occur in textbooks. It is possible that they have an influence on the inefficiency of the coverage shown in Table 7. If students do not know these proper nouns, they would easily know these capitalized words to be proper nouns. Therefore, the insufficiency of the coverage shown in Table 7 is not necessarily crucial, since percentages of proper nouns in graded readers are 2.0-8.4% (Kobayashi 2006a). From this viewpoint, it is likely that 90% coverage may be sufficient.

Other keywords shown in Appendix F include third person pronouns (e.g. he, she), honorifics (e.g. Mr, Mrs), past tense lexical verbs (e.g. went, asked, said), and common nouns (e.g. ship, island). Third person pronouns and honorifics are characteristic of graded readers, especially retold fictions (e.g. Kobayashi 2006a). Past tense lexical verbs have a direct bearing on characters’ behavior, and common nouns relate to each story.

#### 5.4 Readability

Having compared graded readers with textbooks in the viewpoint of vocabulary in the preceding sections, we will now take a look at readability in this section.

We have summarized the readability of authorized textbooks and graded readers in Appendix G. The readability (Flesch–Kincaid Grade Level) is calculated by the formula:  $(0.39 * (\text{total words} / \text{total sentences}) + 11.8 * (\text{total syllables} / \text{total words}) - 15.59)$ . In order to see the differences among grades and levels, we have summed up the above results by grades and levels in Table 8.

Table 8: Average Readability (FRGL) of Grades and Levels

|      |      |      |      |
|------|------|------|------|
| 7th  | 2.10 | GR 1 | 2.23 |
| 8th  | 3.03 | GR 2 | 3.41 |
| 9th  | 3.37 | GR 3 | 3.34 |
| 10th | 5.05 | GR 4 | 4.59 |
| 11th | 5.66 | GR 5 | 6.41 |
| 12th | 6.96 | GR 6 | 5.56 |

As for readability, textbooks get more difficult as grades go up. However, the readability of graded readers is very similar between Level 2 and Level 3, and between Level 5 and Level 6. The latter can be explained by the high level of *Pride and Prejudice*, as we have explained, however Level 2 and Level 3 are not distinguished. Graded readers are controlled well with vocabulary but not as well for readability.

Textbooks for junior high schools are well controlled with readability and their readability is lower than levels 1 to 3 of the graded readers. However, their readability is higher for grades 10 to 12. Students who have studied junior high school English textbooks may not be able to read the same levels of graded readers, but students who have studied senior high school English textbooks can read the same levels of graded readers.

## 6. Conclusion

The present article, which compares graded readers and authorized textbooks, leads us to the following conclusions:

- (1) Comparing six grades in textbooks and six levels in graded readers, textbooks seem to be more difficult than graded readers, based on the variety of words and JACET8000 level.

- (2) Comparing graded readers and textbooks, grade reading scheme may leave much to be desired from the viewpoint of text coverage.
- (3) Extracting the keywords in each level of graded readers, most of them are proper nouns, and these words have an influence on the inefficiency of the coverage.
- (4) Comparing readability of graded readers and textbooks, students who have studied junior high school English textbooks may not be able to read the same levels of graded readers, but students who have studied senior high school English textbooks can read the same levels of graded readers.
- (5) Summarizing the preceding conclusions, graded readers are well controlled with vocabulary but not as well for readability.

However, it is a pilot study, and many points remain as a matter to be discussed further. A pressing need for this study is to examine the grammatical structure of graded readers and textbooks, and it may be achieved by n-gram, POS tag sequence, and parsing.

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## Appendices

### Appendix A: Junior High School English Textbook Series (2002-2005) Used in This Study

1. *New Crown* (Sanseido)
2. *New Horizon* (Tokyo Shoseki)
3. *Sunshine* (Kairyudo)

### Appendix B: Senior High School English Textbook Series (2002-2005) Used in This Study

#### English I (grade 10)

1. *Sunshine* (English IA) (Kairyudo)
2. *One World* (English IA) (Kyoiku Syuppan)
3. *Daily English* (IB) (Ikeda Shoten)
4. *English 21* (IB) (Tokyo Shoseki)
5. *New English Pal* (IC) (Kirihara Shoten)
6. *Access* (IC) (Kaitakusha)

#### English II (grade 11)

7. *Crown* (IIA) (Sanseido)
8. *Unicorn* (IIA) (Bunneido)
9. *Aurora* (IIB) (Chukyo Syuppan)
10. *Clipper* (IIB) (Taishukan)
11. *New World* (IIC) (Sanyu Syuppan)
12. *Acorn* (IIC) (Keirinkan)

#### Reading (grade 12)

13. *Raccorn* (RA) (Chikuma Shobo)
14. *New Horizon* (RA) (Tokyo Shoseki)
15. *Planet Blue* (RB) (Obunsha)
16. *Dream Maker* (RB) (Sanseido)

### Appendix C: Graded Readers Used in This Study (Penguin Readers)

#### Level 1

1. *The Crown*
2. *The House of the Seven Gables*
3. *The Adventures of Tom Sawyer*

#### Level 2

4. *Gulliver's Travels*
5. *The Last of the Mohicans*
6. *Robinson Crusoe*

#### Level 3

7. *Dracula*
8. *Jane Eyre*
9. *Silas Marner*

#### Level 4

10. *The Picture of Dorian Gray*
11. *Emma*
12. *Three Adventures of Sherlock Holmes*

#### Level 5

13. *The Strange Case of Dr Jekyll and Mr Hyde*
14. *Pride and Prejudice*
15. *Sons and Lovers*

#### Level 6

16. *Brave New World*
17. *Great Expectation*
18. *Tom Jones*

Appendix D: Results of Analyses of Junior and Senior High School English Language Textbooks

| text            | grade | letters | tokens | types | lemmas | Guiraud index | sentences | letters/word | syllables/word | word/sentence | JACET 8000 |
|-----------------|-------|---------|--------|-------|--------|---------------|-----------|--------------|----------------|---------------|------------|
| New Crown       | 7     | 3801    | 1033   | 295   | 269    | 9.18          | 247       | 3.68         | 1.36           | 4.18          | 1.26       |
| New Horizon     | 7     | 3890    | 985    | 331   | 297    | 10.55         | 248       | 3.95         | 1.36           | 3.97          | 1.26       |
| Sunshine        | 7     | 6287    | 996    | 343   | 310    | 10.87         | 241       | 3.81         | 1.38           | 4.13          | 1.29       |
| New Crown       | 8     | 6984    | 1659   | 497   | 433    | 12.20         | 270       | 4.21         | 1.46           | 6.14          | 1.22       |
| New Horizon     | 8     | 8015    | 2050   | 568   | 481    | 12.55         | 383       | 3.91         | 1.33           | 5.35          | 1.27       |
| Sunshine        | 8     | 6287    | 1568   | 505   | 442    | 12.75         | 289       | 4.01         | 1.39           | 5.43          | 1.22       |
| New Crown       | 9     | 9522    | 2289   | 684   | 579    | 14.30         | 395       | 4.16         | 1.39           | 5.79          | 1.29       |
| New Horizon     | 9     | 7270    | 1752   | 549   | 454    | 13.12         | 274       | 4.15         | 1.38           | 6.39          | 1.25       |
| Sunshine        | 9     | 8851    | 2138   | 633   | 538    | 13.69         | 319       | 4.14         | 1.43           | 6.70          | 1.25       |
| Sunshine        | 10    | 41020   | 9674   | 1874  | 1495   | 19.05         | 848       | 4.24         | 1.42           | 11.41         | 1.27       |
| One World       | 10    | 38794   | 8882   | 1793  | 1444   | 19.03         | 725       | 4.37         | 1.47           | 12.25         | 1.16       |
| Daily English   | 10    | 31014   | 6575   | 1385  | 1146   | 17.08         | 739       | 4.72         | 1.40           | 8.90          | 1.38       |
| English 21      | 10    | 29850   | 6897   | 1520  | 1118   | 18.30         | 620       | 4.33         | 1.44           | 11.12         | 1.35       |
| New English Pal | 10    | 14756   | 3570   | 937   | 782    | 15.68         | 422       | 4.13         | 1.39           | 8.46          | 1.36       |
| Access          | 10    | 12615   | 3080   | 768   | 636    | 13.84         | 297       | 4.10         | 1.38           | 10.37         | 1.30       |
| Crown           | 11    | 63615   | 14720  | 2578  | 2040   | 21.25         | 1187      | 4.32         | 1.44           | 12.4          | 1.27       |
| Unicorn         | 11    | 48885   | 11489  | 2229  | 1789   | 20.80         | 883       | 4.25         | 1.43           | 13.01         | 1.16       |
| Aurora          | 11    | 48753   | 10903  | 2182  | 1784   | 20.90         | 965       | 4.47         | 1.50           | 11.3          | 1.38       |
| Clipper         | 11    | 39916   | 9682   | 1724  | 720    | 17.52         | 960       | 4.12         | 1.41           | 10.09         | 1.35       |
| New World       | 11    | 19795   | 4671   | 1194  | 1001   | 17.47         | 507       | 4.24         | 1.37           | 9.21          | 1.36       |
| Acorn           | 11    | 12759   | 2888   | 825   | 669    | 15.35         | 312       | 4.42         | 1.50           | 9.26          | 1.30       |
| New Horizon     | 12    | 67592   | 15648  | 2656  | 2096   | 21.23         | 1215      | 4.32         | 1.44           | 12.88         | 1.40       |
| Raccoon         | 12    | 77423   | 17662  | 3311  | 2715   | 24.91         | 1208      | 4.38         | 1.46           | 14.62         | 1.49       |
| Dream Maker     | 12    | 54292   | 12555  | 2520  | 2033   | 22.49         | 912       | 4.32         | 1.44           | 13.77         | 1.49       |
| Planet Blue     | 12    | 55731   | 12368  | 2823  | 2326   | 25.38         | 943       | 4.51         | 1.51           | 13.12         | 1.59       |

## Appendix E: Results of Analyses of Graded Readers

| text                                      | level | letters | tokens | types | lemmas | Guiraud index | sentences | letters/word | syllables/word | word/sentence | JACET 8000 |
|---|-------|---------|--------|-------|--------|---------------|-----------|--------------|----------------|---------------|------------|
| The Crown                                 | 1     | 15079   | 4006   | 392   | 311    | 6.19          | 665       | 3.76         | 1.27           | 6.02          | 1.11       |
| The House of the Seven Gables             | 1     | 17141   | 4113   | 410   | 311    | 6.39          | 713       | 4.17         | 1.35           | 5.77          | 1.15       |
| The Adventures of Tom Sawyer              | 1     | 15810   | 4008   | 374   | 297    | 5.91          | 599       | 3.94         | 1.30           | 6.69          | 1.13       |
| Gulliver's Travels                        | 2     | 36657   | 9739   | 841   | 622    | 8.52          | 1041      | 3.76         | 1.28           | 9.36          | 1.13       |
| The Last of the Mohicans                  | 2     | 26054   | 6243   | 622   | 465    | 7.87          | 897       | 4.17         | 1.41           | 6.96          | 1.17       |
| Robinson Crusoe                           | 2     | 37163   | 9822   | 788   | 613    | 7.95          | 1045      | 3.78         | 1.29           | 9.40          | 1.17       |
| Dracula                                   | 3     | 52709   | 12869  | 1335  | 1011   | 11.77         | 1409      | 4.10         | 1.36           | 9.13          | 1.24       |
| Jane Eyre                                 | 3     | 32145   | 8489   | 818   | 657    | 8.88          | 1123      | 3.79         | 1.31           | 7.56          | 1.13       |
| Silas Marner                              | 3     | 78831   | 19937  | 1425  | 1034   | 10.09         | 2401      | 3.95         | 1.32           | 8.30          | 1.17       |
| The Picture of Dorian Gray                | 4     | 64637   | 16557  | 1393  | 1071   | 10.83         | 1879      | 3.90         | 1.35           | 8.81          | 1.21       |
| Emma                                      | 4     | 61116   | 15107  | 1162  | 902    | 9.45          | 1151      | 4.05         | 1.38           | 13.13         | 1.18       |
| Three Adventures of Sherlock Holmes       | 4     | 69219   | 17775  | 1867  | 1095   | 14.00         | 1630      | 3.89         | 1.32           | 10.90         | 1.24       |
| The Strange Case of Dr Jekyll and Mr Hyde | 5     | 87487   | 21505  | 2426  | 1811   | 16.54         | 1349      | 4.07         | 1.37           | 15.94         | 1.33       |
| Pride and Prejudice                       | 5     | 177435  | 41361  | 2770  | 2087   | 13.62         | 2485      | 4.29         | 1.47           | 16.64         | 1.34       |
| Sons and Lovers                           | 5     | 77977   | 19147  | 2208  | 1762   | 15.96         | 1911      | 4.07         | 1.35           | 10.02         | 1.33       |
| Brave New Worlds                          | 6     | 154044  | 36276  | 3540  | 2722   | 18.59         | 3401      | 4.25         | 1.40           | 10.67         | 1.42       |
| Great Expectations                        | 6     | 140960  | 36402  | 2945  | 2260   | 15.44         | 2563      | 3.87         | 1.32           | 14.20         | 1.28       |
| Tom Jones                                 | 6     | 106289  | 25906  | 2216  | 1694   | 13.77         | 1950      | 4.10         | 1.39           | 13.29         | 1.29       |

## Appendix F: Keywords in Graded Readers (in Comparison with Textbooks)

| Rk | GR1 / 7th    |        | GR2 / 7-8th  |        | GR3 / 7-9th  |        |
|----|--------------|--------|--------------|--------|--------------|--------|
|    | word         | LLR    | word         | LLR    | word         | LLR    |
| 1  | the          | 59.76  | and          | 139.19 | he           | 283.28 |
| 2  | Tom          | 48.37  | men          | 135.19 | was          | 140.80 |
| 3  | and          | 46.47  | the          | 78.84  | his          | 127.24 |
| 4  | to           | 42.23  | Heyward      | 60.98  | Silas        | 114.43 |
| 5  | went         | 40.82  | ship         | 59.26  | and          | 98.09  |
| 6  | he           | 40.36  | island       | 57.53  | her          | 97.27  |
| 7  | asked        | 30.51  | Magua        | 46.02  | Godfrey      | 76.08  |
| 8  | didn         | 26.33  | was          | 45.33  | Rochester    | 67.42  |
| 9  | his          | 24.82  | my           | 44.22  | him          | 63.11  |
| 10 | there        | 23.31  | boat         | 42.57  | she          | 60.86  |
| Rk | GR4 / 7-10th |        | GR5 / 7-11th |        | GR6 / 7-12th |        |
|    | word         | LLR    | word         | LLR    | word         | LLR    |
| 1  | Emma         | 447.50 | her          | 665.98 | Tom          | 601.54 |
| 2  | Dorian       | 310.46 | Elizabeth    | 590.08 | Sophia       | 480.43 |
| 3  | he           | 280.27 | Mr           | 443.61 | Mr           | 466.46 |
| 4  | Mr           | 257.49 | she          | 418.54 | her          | 441.87 |
| 5  | Harriet      | 227.57 | Darcy        | 327.78 | Joe          | 356.09 |
| 6  | Holmes       | 171.81 | he           | 314.79 | he           | 340.16 |
| 7  | Basil        | 153.73 | had          | 269.89 | Havisham     | 318.28 |
| 8  | Knightley    | 149.20 | was          | 266.08 | Bernard      | 308.28 |
| 9  | Elton        | 143.18 | Bennet       | 263.24 | said         | 304.58 |
| 10 | Henry        | 141.67 | Bingley      | 242.86 | Estella      | 300.27 |

## Appendix G: Readability of Textbooks and Graded Readers

| text                 | grade | readability | text                                      | level | readability |
|----------------------|-------|-------------|---|-------|-------------|
| New Crown            | 7th   | 2.04        | The Crown                                 | 1     | 1.73        |
| New Horizon          | 7th   | 2.00        | The House of the Seven Gables             | 1     | 2.58        |
| Sunshine             | 7th   | 2.26        | The Adventures of Tom Sawyer              | 1     | 2.39        |
| New Crown            | 8th   | 3.98        | Gulliver's Travels                        | 2     | 3.20        |
| New Horizon          | 8th   | 2.17        | The Last of the Mohicans                  | 2     | 3.79        |
| Sunshine             | 8th   | 2.95        | Robinson Crusoe                           | 2     | 3.25        |
| New Crown            | 9th   | 3.05        | Dracula                                   | 3     | 4.02        |
| New Horizon          | 9th   | 3.21        | Jane Eyre                                 | 3     | 2.77        |
| Sunshine             | 9th   | 3.85        | Silas Marner                              | 3     | 3.24        |
| Sunshine (IA)        | 10th  | 5.64        | The Picture of Dorian Gray                | 4     | 3.75        |
| One World (IA)       | 10th  | 6.52        | Emma                                      | 4     | 5.79        |
| Daily English (IB)   | 10th  | 4.37        | Three Adventures of Sherlock Holmes       | 4     | 4.23        |
| English 21 (IB)      | 10th  | 5.73        |   |       |             |
| New English Pal (IC) | 10th  | 4.05        |   |       |             |
| Access (IC)          | 10th  | 4.00        |   |       |             |
| Crown (IIA)          | 11th  | 6.28        | The Strange Case of Dr Jekyll and Mr Hyde | 5     | 6.74        |
| Unicorn (IIA)        | 11th  | 6.38        | Pride and Prejudice                       | 5     | 8.22        |
| Aurora (IIB)         | 11th  | 6.47        | Sons and Lovers                           | 5     | 4.26        |
| Clipper (IIB)        | 11th  | 4.93        |   |       |             |
| New World (IIC)      | 11th  | 4.16        |   |       |             |
| Acorn (IIC)          | 11th  | 5.71        |   |       |             |
| New Horizon (RA)     | 12th  | 6.45        | Brave New Worlds                          | 6     | 5.12        |
| Raccoon (RA)         | 12th  | 7.30        | Great Expectations                        | 6     | 5.57        |
| Dream Maker (RB)     | 12th  | 6.80        | Tom Jones                                 | 6     | 5.99        |
| Planet Blue (RB)     | 12th  | 7.29        |   |       |             |