

## *Japanese High School Textbooks: How Readable Are They?*

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*Despite the clear focus on the development of students' communicative competence in the 1994 Mombusho (Japanese Ministry of Education) Course of Study Guidelines for the high school English classroom, there is much evidence to suggest that, for many teachers, teaching practice still remains focused primarily on grammar-translation, pattern drills and memorization. This seems to be especially true of the English reading classroom. Other research which had looked into the prevalence of the Yakudoku method of translating English passages into Japanese has suggested that it is largely a result of either historical or sociological factors. The research presented here adds to this discussion by exploring whether or not reading difficulty and lexical load also contribute to this overreliance on translation. Randomly selected passages from the top three selling Mombusho approved reading textbooks were scanned into a computer and analyzed for readability via traditional readability formulas such as the Flesh-Kinkaid, and for lexical difficulty via VocabProfile (Nation, 1993). Results indicate that although most passages were rated as relatively easy by the readability formulas, lexical difficulty was extremely high, partially explaining the need for students and teachers to rely on translations and dictionaries. Implications for teaching, and materials development, as well as for research which relies exclusively on readability formulas are discussed.*

Although the newly implemented Ministry of Education Course of Study Guidelines clearly states that the overall objective of English language teaching in high school is to foster communicative ability (Takanashi, Midorikawa, & Wada, 1995), there is much anecdotal evidence (for example, see Bamford, 1992; Browne & Evans, 1994; Law, 1994; Nozawa, 1993) which suggests that classroom practice has changed very little, and is still focused primarily on form, accuracy, grammar translation and memorization.

While much attention has been given to problems associated with implementation of the newly created Oral 1, II, and III classes (Gould, Carter, & Madeley, 1994; Izumi, 1995; Knight, 1995; Miller, 1995; Takanashi, Midorikawa, & Wada, 1995), there has been very little published on the impact that the new guidelines have had in the high school reading classroom.

Over the years there have been several studies which have looked at the prevalence in the reading classroom of the Yakudoku method of line by line translation of English sentences into Japanese (Hino, 1988; Koike et. al., 1985; Law, 1995). The 1994 Course of Study Guidelines, however, not only make no mention of translation or Yakudoku as goals or techniques to be used in the reading classroom, but are also clearly communicative in their orientation. For example, the overall objective of the reading classroom is "to further develop students' abilities to read passages and understand the writer's intentions, and to foster a positive attitude toward understanding written English" (Takanashi, Midorikawa, & Wada, 1995).

Here, too, though, there seems to be a large gap between stated goal and actual practice. A large scale survey conducted in 1984 (Koike, et. al., 1985) revealed that over 80% of Japanese English reading teachers use the Yakudoku method. Horibe (1995), reports that regardless of proficiency level, the vast majority of Japanese students still use translation to confirm comprehension of written texts. Law (1994), argues that Yakudoku does not adequately prepare students for the recent shift in college entrance exams towards using more fluency-oriented, contextualized, task-based questions.

Although the many theories that have been offered as to why Japanese students rely so heavily on translation have ranged from historical reasons (Rohlen, 1982; Horio, 1988) to sociological factors (Hildebrant & Giles, 1980; Kelly, 1993), I also believe that the lexical difficulty of these texts may prove to be an important contributing factor.

### **Readability Formulas**

Based on the research design of a study done by Brown and Yamashita (1995) that analyzed the difficulty of reading passages on Japanese university entrance exams using a variety of readability formulae, Browne (1996), conducted a small-scale study which compared the reading difficulty of randomly selected Japanese high school and university English textbooks with that of American university and graduate school textbooks, and found that the Japanese high school textbook passages analyzed were considerably harder than most Japanese college level texts and several introductory American college textbooks.

Although the readability formulas were helpful in rating the approximate difficulty of texts with relation to each other, the number figures given by the formulas seemed to have little relation to actual school grade levels, and revealed little about what specifically was difficult about a particular passage. According to the Microsoft Word on-line manual (Microsoft, 1995), the Flesch-Kincaid Grade Level calculates reading difficulty based on a formula that considers only the number of syllables per word and the average number of words per sentence. The Coleman-Liau Grade Scale is described by Spangler (1980) as being based on a regression equation which contains four variables; number of one-syllable words per 100 words, number of sentences per 100 words, number of pronouns per 100 words and number of prepositions per 100 words. Neither formula, however, take into consideration such important factors as grammatical complexity, conceptual difficulty, ideational difficulty, or word difficulty (beyond the very basic level of counting syllables).

There is evidence, however, that the numerical ratings of readability formulas are not as precise as their two to three decimal point ratings make them appear. In both the 1995 Brown and Yamashita study and the 1996 Browne study (as well as in the results reported here), reading passages examined at a particular level varied between two and four full grade levels from each other in their Flesch-Kincaid and Bormuth-Liau rating. O'Hear, Ramsey, and Richard (1990) point out the serious discrepancy which exists between students' perceptions of text difficulty and the ratings made by readability formulas. Researchers who have looked at the growing role of computers and readability formulas in this type of study (Duffelmeyer, 1985; Olson, 1984) have warned teachers and researchers to beware of the aura of precision of such formulas, arguing that they are based on criteria that is either faulty or too simplistic. Studies such as Cottler (1987), which have tried to establish external validity for readability formulas have failed to show any significant relationship.

### **Research Questions**

The underlying motivation behind this study is the belief that vocabulary plays a much more important factor in reading skills development than has previously

been acknowledged in the literature, and that lexical difficulty may be a strong contributing factor to the prevalence of the Yakudoku method of teaching English reading classes in Japanese high schools. In the research presented here, I analyze the top three selling Ministry of Education-approved high school English reading texts in an attempt to answer the following research questions:

1. What kind of vocabulary words are high school students exposed to and expected to master in their reading courses?
2. What is the reading difficulty, in terms of vocabulary load, of randomly selected reading passages from the most widely used high school reading texts?

### **Theoretical Background**

In an article titled "The Mathematics of Language" Kucera (1982) points out that human language exhibits the somewhat contradictory characteristics of both efficiency and redundancy. For example, the English language is redundant in the sense that it has only a limited number of permissible phonemes (33), as well as strict rules on what phonemes can occur together to form words (i.e., trip but not Clip).

It is also extremely efficient in the sense that the vast majority of high frequency words are very short -- 57% of the words in the one million word Brown Corpus (Kucera, 1982), are four or fewer letters, while the repeat-rate for long words is extremely low -- "for every occurrence of a ten-letter word there are eight occurrences of a three-letter word, and for every occurrence of a twenty-letter word there are 3,524 occurrences of a three-letter word" (Kucera, 1982, pg. 39).

#### *Word Frequency*

The results of the numerous corpus-based word frequency studies done over the past few decades (Johansson & Hofland, 1989; Kucera, 1982; Thorndike & Lorge, 1944; West, 1953), reveal that this efficiency goes beyond word length alone. Despite research which estimates that the average 18 year old native English speaker has a vocabulary of somewhere between 16,000 (D'Anna, Zechmeister, & Hall, 1991) and 40,000 words (Nagy & Anderson, 1984), and the enormous total amount of words in the English language (there are 128,000 words, for example, in the large Webster's dictionary), the most frequent words in the English language account for a disproportionate amount of the total number of running words readers encounter on a typical page of written text.

Table 1 summarizes the findings of Nation (1990), which are based on his own research on acquisition of technical vocabulary and vocabulary in university settings, as well as West's (1953) General Service List. According to these figures, knowledge of the 1000 most frequent words in the English language (less than 1% of the words appearing in the Webster's Dictionary) would allow a reader to understand approximately 75% of the words appearing on a page of text. Similar findings have been reported in Engels (1969), and Johansson & Holland (1989). If readers know an additional 1000 words the percentage of coverage jumps to an impressive 87%.

Nation (1990), also found that a small number of additional words beyond the first 2000 occurs quite frequently within the genre of academia. Referred to in the literature as the "University Word List ", knowledge of these additional 836 words

gives learners understanding of about 8% more words on the page, for a total of 95%. Nation (1990), and others (for example, see Marshall & Gilmour 1993), have demonstrated that within specific technical fields, certain words occur quite frequently, and that mastery of the 1000-2000 specialized words associated with that field can give the learner an additional 2-3% coverage.

Table 1: Frequency in Terms of Percent Coverage of Running Words in a Text

<u>Type of Word</u>	<u>Number of Words</u>	<u>Percent of Words on a Page</u>
High Frequency Words	1,000	75%
High Frequency Words	2,000	87%
University Word List	836	8% (in academic texts)
Technical Words	2,000	3% (in technical texts)
Low Frequency Words	123,200	2%

### *The Relationship Between Lexis and Reading Ability*

The importance of these frequency figures and the high percentage of coverage of running words that they offer becomes clear as one considers the close relationship between lexical knowledge and reading ability, as well as the growing body of research on how many words a non-native speaker needs to know to interact effectively with unsimplified texts. Chall (1987), for example, found that student scores on vocabulary measures were so highly correlated with reading comprehension scores, that reading vocabulary quizzes could be substituted for paragraph meaning tests.

Although we often hear complaints of student's overreliance on dictionaries along with the admonishment that they need to learn to guess meaning from context, Marshall and Gilmour's (1993) study of the relationship between lexical knowledge and reading ability in ESP students found that top down reading skills such as schema activation depended on students already having a large vocabulary. Laufer and Sim (1985) found that the language base needed for students to be able to guess meaning from context was largely lexical in nature.

### *How Many Words Do Students Need to Know?*

Hirsch and Nation (1992), in their study of three short, unsimplified children's novels found that knowledge of the most frequent 2000 words from West's (1953) General Service List gave the reader coverage of about 90% of the running words in the text. The authors point out, however, that this would still leave the reader with one out of every ten words as unknown, and cite research by Laufer (1989), and Liu and Nation (1985), which shows that about 95% coverage of text is necessary for students to be able to reach an acceptable level of reading comprehension, and to be able to guess meaning from context.

Laufer's (1992a) study found that the minimum lexical threshold at which there were more readers than non-readers (operationalized as those students who received passing scores on the two standardized reading tests used in the experiment) was 3000 words. This threshold also marked the level at which students who were proficient readers in their L1 were able to transfer their reading strategies to the L2. A follow-up study done by Laufer (1992b), which looked at how L2 reading was affected by lexical knowledge and general academic ability, found that students

with a vocabulary size of less than 3000 word families could not read well regardless of their academic ability, and similarly, that students with vocabulary sizes of 5000 or larger could read well in their L2 whatever their general ability.

All of the above studies highlight the importance of student knowledge of the most frequent several thousand words in the English language. Non-familiarity with these words almost assures that students will not be able to use top down skills, activate schema, guess from context, score well on reading exams, or develop reading fluency. These findings lead us to the question "what is the vocabulary load of Japanese high school reading materials?"

### **Method**

For this study, Spectrum (Shiozawa, et. al., 1996), Milestone (Tanimoto, et. al., 1996), and Unicorn (Suenaga, et. al., 1996), the three top selling Ministry of Education-approved high school reading textbooks, (Naigaikyoiku, 1996), were chosen for analysis of readability and lexical difficulty. The contents of each reading passage were inputted into the computer via scanner using the OmnipagePro OCR program for Macintosh (Caere Corporation, 1994). Due to the time intensive nature of the scanning process, only about 25% of the actual reading material from each textbook was analyzed in this study. Due to the danger of skewing results if only difficult passages were chosen, the following process was used. For each book, either three or four chapters were selected (depending on the total number of chapters in the book) by randomly selecting a starting chapter and then also selecting either every third or every fourth subsequent chapter. For example, in Spectrum, which has sixteen chapters, every fourth chapter was selected for analysis (25% of the total number of chapters). Since chapter four was randomly selected as the starting point (by choosing a slip of paper from a hat), chapters four, eight, twelve and sixteen were analyzed in this study.

Then each chapter was transferred to a Microsoft Word (Microsoft Software 1995), document so that standard readability statistics such as the Flesch-Kincaid Grade Scale and the Coleman-Liau Grade Level could be calculated via the formulas included with Word's grammar checker.

Next, an analysis of the lexical difficulty of each chapter was conducted via the VocabProfile program for MS-DOS (Nation, 1993). This program compares the words in a text file with three word frequency lists and classifies each word into one of four categories: a) a word occurring within the top 1000 high frequency words on West's 1953 General service List, b) a word occurring within the 1001-2000 high frequency words range on West's 1953 General service List frequency words, c) a word from Nation's 1984 University Word List (Nation, 1990), or d) an unknown word (i.e., all words not included in the above lists). For the purpose of this study, all words tagged by the program as unknown were classified as low frequency words.

### **Results and Discussion**

The analysis of the high school reading passages via readability formulae is summarized in Table 2. In general, most passages were not rated as being very difficult by the formulae used in this study. The Flesch-Kincaid, for example, rated chapter two from Milestone (Tanimoto, et. al., 1996), as being the most difficult passage, with a grade-scale rating of only 8.1. Indeed, the average Flesch-Kincaid

rating was only 5.89, approximately sixth-grade reading level. This is a full six grade levels below the twelfth-grade level where the textbooks would be typically used in a Japanese high school classroom. Even the Coleman-Liau, which consistently rated all passages as being at a higher difficulty level, only gave an average rating of 8.7, still a full three grade levels lower -- ratings that are low enough to consider all passages, at least according to the readability formulae, as being simplified texts.

*Table 2: Readability Statistics for Japanese High School Textbooks*

<u>Textbook/Chapter/Title</u>	<u>Number of Words</u>	<u>Flesch Reading Ease</u>	<u>Flesch Kinkaid</u>	<u>Coleman Liau</u>	<u>Bormuth Grade Level</u>
Spectrum 4: A secret for two	498	78.77	4.92	8.5	8.5
Spectrum 8: The first men on the moon	1256	70.59	6.38	10.32	9.5
Spectrum 12: A boy's decision	1671	82.2	5.15	7.9	8.9
Spectrum 16: There will come soft rains	1318	77.7	5.47	11.3	9.8
Milestone 2: Things have their origins	670	63.31	8.1	10.27	10.1
Milestone 7: The colors that bees see	1162	82.82	5.33	6.28	8.5
Milestone 12: The greenhouse effect	954	66.34	7.53	10.52	9.5
Milestone 17: The concluding speech of a dictator	971	80.83	4.78	8.58	8.5
Unicorn 2: Limelight	3085	84.58	4.57	6.11	8.2
Unicorn 6: The Emerald Isle	1258	69.9	7.71	8.73	8.9
Unicorn 10: Madam Curie	2107	80.35	4.92	7.50	8.2

The results of an analysis of the same passages via VocabProfile (summarized in Table 3), however, seems to indicate that the passages are more difficult than the readability formulae ratings suggest. For example, whereas West (1953) and others (for example, Engels, 1969; Nation, 1990; Nation & Hwang, 1995), have found that the first 1000 words of the General Service List usually gives about 75% coverage of running words in unsimplified, native-speaker texts, only two of the eleven Japanese high school texts analyzed here came close to that amount.

As can be seen in Table 4, the first 1000 words only gave an average of about 68% coverage of the running words in the high school texts, with a low of 64% for Spectrum (Shiozawa, et. al., 1996) to a high of 72% for Milestone (Tanimoto, et. al., 1996). Knowledge of the first 1000 words, then, would still leave the student with four out of every ten words as unknown.

The reading difficulty associated with having to deal with a large number of unknown words may become clearer after considering a sample of high school text data that has been processed by VocabProfile. Here, for example, is how VocabProfile analyzes the words in a text that has been inputted into the program.

Table 3: VocabProfile Analysis for Japanese High School Textbooks

<u>Textbook/Chanter</u> <u>Title</u>	<u>1000</u> <u>word</u> <u>level</u>	<u>2000</u> <u>Word</u> <u>level</u>	<u>UWL</u>	<u>LFW</u>
<i>Spectrum 4:</i> <i>A Secret for Two</i>	65.1%	11.7%	4.2%	19%
<i>Spectrum 8:</i> <i>The First Men on the Moon</i>	56.6%	13.8%	6.6%	23.1%
<i>Spectrum 12:</i> <i>A Boy's Decision</i>	68.7%	10.8%	2.5%	18%
<i>Spectrum 16:</i> <i>There will come Soft Rains</i>	59.3%	12.4%	8.4%	19.9%
<i>Spectrum Word List</i>	19.8%	25.7%	16.4%	38.2%
<i>Milestone 2:</i> <i>Things Have Their Origins</i>	69.7%	8.6%	2.5%	19.1%
<i>Milestone 7:</i> <i>The Colors that Bees See</i>	76.2%	7.4%	2.5%	13.9%
<i>Milestone 12:</i> <i>The Greenhouse Effect</i>	69.7%	8.6%	2.5%	19.1%
<i>Milestone 17:</i> <i>The Concluding</i>				
<i>Speech of a Dictator</i>	66.2%	11.9%	1.2%	20.6%
<i>Milestone Word List</i>	18.5%	21.7%	19.6%	40.3%
<i>Unicorn 2:</i> <i>Limelight</i>	74.2%	13.7%	1.4%	10.7%
<i>Unicorn 6:</i> <i>The Emerald Isle</i>	58.3%	11.6%	4.4%	25.7%
<i>Unicorn 10:</i> <i>Madam Curie</i>	73.8%	13.7%	2.4%	10.1%
<i>Unicorn Word List</i>	13.3%	27.1%	11.5%	48%

Table 4: Percent coverage by Knowing the First 1000 Words of West's General Service List

<u>Textbook (no. of chanters)</u>	<u>Percent Coverage by first 1000 words of the GSL</u>
Spectrum (4 chapters)	64.3%
Milestone (4 chapters)	71.7%
Unicorn (3 chapters)	68.76%
Total (11 chanters)	68.25%

This selection, a randomly selected paragraph from Spectrum Unit 16, "There Will Come Soft Rains", has been tagged so that all the low frequency words are marked: \*word\*, all words from the University Word list are marked: =word=, all words in the 1000-2000 frequency range are marked: +word+, and all the remaining words, from the list of 1000 most frequent words, are left unmarked:

To put it \*concisely\*, walking is an =inherent=, =biological= =function= of man. Not so language. It is of course true that in a certain sense the =individual= is \*predestined\* to talk, but that is due entirely to the =circumstance= that he is born not merely in, but in the \*lap\* of a society that is certain, reasonably certain, to lead him to its =traditions=. =Eliminate= society and there is every reason to believe that he will learn to walk, if, indeed, he \*survives\* at all. But it is just as certain that he will never learn to talk, that is, to =communicate= ideas according to the =traditional= system of a particular society. Or, again, =remove= the \*new-born\* =individual= from the social =environment= into which he has come and \*transplant\* him to an \*utterly\* \*alien\* one. He will develop the art of walking in his new =environment= very much as he would have developed it in the old.

But his +speech+ will be completely at =variance= with the +speech+ of his +native+ =environment=. Walking, then, is a general human activity that =varies= only within \*circumscribed\* limits as we pass from =individual= to =individual=. Its =variability= is \*involuntary\* and purposeless. +Speech+ is a human activity that =varies= without \*assignable\* limit as we pass from social group to social group, because it is a purely \*historical\* =heritage= of the group, the product of \*long-continued\* social =usage=.

In comparison to the overall textbook averages found in Table 4, the lexical difficulty of the passage selected here, summarized in Table 5 below, is quite easy. Of the 233 words in the selection, 194 were from the first 1000 words, which means that knowledge of these words would give the reader about 83% coverage of all the words encountered on the page (in contrast to the 68% average coverage figure given in Table 4).

**Table 5: *VocabProfile Analysis of a Short Passage from Spectrum Unit 16***

Type of Word	# of Words	% a of Text
First 1000 Words	194	83%
1000-2000 Word Range	4	2%
University Word List	22	9%
Low Frequency Words	13	6%
Totals	233	100%

However, if the first three sentences from same passage are rewritten so that all low frequency and University Word List vocabulary is omitted, (i.e., by assuming that students know every one of the first 2000 words), it becomes easier to understand the obstacles students face in developing reading fluency when confronted with even a relatively small number (15%) of unfamiliar words:

To put it (word 1) walking is an (word 2) (word 3) (word 4) of man. Not so language. It is of course true that in a certain sense the (word 5) is (word 6) to talk, but that is due entirely to the (word 7) that he is bom not merely in, but in the (word 8) of a society that is certain, reasonably certain, to lead him to its (word 9).

The nine unknown words in this 64 word passage represent about 14% of the total. At this level, approximately one in every seven words is unknown, making it fairly difficult to guess the meaning of the new words from context. If the lexical difficulty of this passage were to be increased to the 68% level reported in Table 4 (the average for all text passages surveyed), an additional eleven words would have to be blanked out, making the task of guessing from context almost impossible.

Even if we were to assume that Japanese high school students knew all of the top 2000 most frequent words in the English language, this still would leave an average of 20% of the running words as unknown, far too many for teachers to expect students to be able to read fluently, or guess meaning from context.

Although not the focus of this study, a relevant question then becomes, "what is the average vocabulary size of Japanese high school students?" In a review of studies on the vocabulary size of foreign students from a variety of L1 backgrounds who went on to learn EAP in university settings, Laufer (1987) reports a range of

between 300 to 3000 words. This is very similar to the range reported for Japanese college students in Browne (1996), where only 8% of a group of 66 freshman scored 80% or higher at the 2000 word level on Nation's Vocabulary Levels Test (Nation, 1990). Interestingly, students who took this test had almost no knowledge of words on the University Word List, scoring higher on even the extremely low frequency words at the 10,000 word level. These results may be an indication that Japanese high school English education spends too much time teaching low frequency words and too little time focusing on high frequency words.

Indeed, at least for the top three selling Ministry of Education-approved reading textbooks analyzed in this study, the direct teaching of low frequency words makes up a very high proportion the total number of new words introduced in each book. As can be seen in Table 6, if words appearing on the University Word List vocabulary are also treated as low frequency vocabulary, then an astonishing average of 58% of all new words introduced in these textbooks can be classified as low frequency vocabulary.

Table 6: Classification of New Vocabulary Words in High School Textbooks

<u>Textbook/Chapter</u>	<u>1000 word</u>	<u>2000 word</u>	<u>LFW</u>
<u>Title</u>	<u>level</u>	<u>level</u>	<u>(LFW + UWL)</u>
<i>Spectrum Word List</i>	19.8%	25.7%	54.6%
<i>Milestone Word List</i>	18.5%	21.7%	59.9%
<i>Unicorn Word List</i>	13.3%	27.1%	59.5%
<i>Averages</i>	17.2%	24.8%	58%

Table 7: Examples of Unusual Low Frequency Words Directly Taught in Textbooks

anemone	cockcrow	cataclysm	lappilus	pitchblende	fodder
hearth	neigh	seedle	whin	mazurka	polonaise
syncopate	insularism	prodigious	megalopolis		

Furthermore, a quick survey of the words tagged by VocabProfile as being low frequency seems to indicate that many are so unusual that they would probably be considered difficult even by native speakers (see Table 7). At the very least, it is unlikely that the learning of these words would add much to the students ability to read other texts in the future since the chance of these words occurring regularly seems so remote.

## Conclusion

The results of this preliminary study seem to indicate that the vocabulary load of Japanese high school texts is considerable. It is not surprising that Japanese students report spending large quantities of time using dictionaries, memorizing word lists, and translating -when 30-40% of the words they encounter are unknown, they have little choice. Laufer (1989) describes the problem well when she asks "is it therefore surprising that very often learners prefer working with a bad translation of the literature to the almost incomprehensible originals? A gap of 2000-4000 words between the amount of words they know and they should know turns reading into 'mission impossible'".

If future research supports the findings of this study, then it seems clear that if the Ministry of Education's Course of Study Guidelines for reading are ever to be achieved, the related issues of the readability and lexical difficulty of current reading textbooks will need to be addressed. Promising research by Coady (1993), showed

that the explicit study of high frequency words led to higher scores on reading comprehension tests. His call for the development of a sight vocabulary of the most frequent 2000 words as an important first step to reading skills development could be applied to future reading textbook revisions.

Instead of forcing students to spend inordinate amounts of time memorizing so many low frequency words to deal with their assigned texts, it would seem a wise and prudent step to first make sure that students get control of the high frequency words and University Word List vocabulary. This would bring them much closer to crossing the 95% lexical threshold which seems so important when reading unsimplified texts.

Another, perhaps easier alternative would be for future editions of high school textbooks to utilize simplified texts. A study by Woodinsky and Nation (1988), showed that graded readers can help students to develop reading fluency with limited vocabularies. The researchers found that knowledge of as little as 600 words was sufficient to give 95% coverage of the words in the text. A similar study by Hirsh and Nation (1992), also highlighted the usefulness of simplified reading materials and revealed a need for graded readers at the 2600-5000 word level to help students to make the transition from simplified to unsimplified materials. It also showed that low frequency words which occurred more than five times in a reading text had a good chance of being learned due to repetition, a finding which implies that Japanese reading texts might be made easier by making sure that students get multiple exposures to difficult words.

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