

# Text Complexity as a Factor of Japanese EFL Learners' Reading Strategy

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**Abstract:** The aim of this paper is to examine how text difficulty (easy and difficult) affects frequency of reading strategy use by Japanese EFL learners at different reading levels. Fifty-two Japanese EFL college students answered two reading tests comprised of two text types (easy and difficult) after an interval of three months, followed by the questionnaire on what reading strategies they used during the comprehension processes. The subjects were divided into three groups (high, intermediate, and low), depending on total scores of the two reading tests. Two way ANOVA was conducted with means of frequency of strategy use. The results revealed frequency of strategy use was affected mostly by Group (high, intermediate, and low), not by Text Type (easy and difficult). There was only one interaction effect. It indicates that Japanese EFL learners are not likely to change the strategy use at differing level of the text. The low-level group and some of the intermediate group may need to pass a certain linguistic threshold level before they are able to use local strategies and global strategies effectively. The high-level group, who are assumed to have done so, may need more cognitive resources to employ localized/intensive strategies and cognitive strategies effectively. Unlike L1 fluent readers, it might be difficult for EFL Japanese learners to use a variety of cognitive strategies effectively at differing levels owing to limited cognitive resources.

Key words: text difficulty, reading strategies, Japanese EFL college students

## 1. Introduction

Readability has received increasing attention since the 1920's and studies to measure readability has been conducted mainly by presenting readability formula in order to find the appropriate text book to match the level of learners. It has widely spread in the U.S.A. not only in educational fields but government agencies to assess the difficulty of reading passages as the objective criteria (Takanashi & Ushiro, 2000). To select appropriate textbooks suitable for the level of learners helps learners solve reading obstacles in comprehension processes and remove their mental stress.

Text difficulty affects reading strategies by the reader's proficiency level (Anderson, 1991; Kletzien, 1991; Midorikawa et al., 2001). For example, as Kletzien (1991) states, good readers use a variety of strategies more consistently than poor readers in comprehension processes as the difficulty of the passage increases. Anderson (1991) proposes that, if the text is too difficult, poorer readers might not know how (i.e., when and where) to use the strategies effectively. As for strategy use, Carrell (1989) reports that high-proficiency L2 readers frequently use global strategies, i.e., relating to background knowledge, inferences, connecting information and text gist, whereas she suggests that low-proficiency or developing L2 readers rely on local strategies, e.g., word-by-word translation, paying attention to semantic/grammatical segments, and syntactic parsing, although these strategies are important for them. In contrast, Stanovich (1980) claims that poor readers make as much as or more

use of context than good readers, if they come across unknown words. If the text difficulty increases, how do Japanese EFL learners use strategies at bottom-up and top-down processes, with increasing difficulty? Do low-level learners use global strategies as frequently as high level learners? “Local strategies” here concern sentence meaning, focusing on the details of words and text at bottom-up process, whereas “global strategies” focus on inter-sentential and text meanings at top-down processes (Carrell, 1989).

The purpose of this study is to examine how text difficulty (easy and difficult) affects Japanese EFL learners, depending on reading abilities (high, intermediate and low). The original text was revised into two types of texts (easy and difficult), referring to the readability and vocabulary level. I hope that the findings of this study will help L2 teachers instruct strategies effectively by utilizing textbooks.

## 2. Literature review

### 2.1 Text Difficulty: Vocabulary size and syntactic complexity

Readability is an important factor to reflect the interaction of the reader and the text. Studies to measure readability have been conducted “to find the best predictor or groups of predictors of text difficulty” using statistical means, examining mainly linguistic features for the purpose of achieving the best match between readers and text (Alderson & Urquhart, 1984: xxii). However, there are no clear-cut criteria for determining what factors make the text difficult or easy. Readability is measurable as long as it is related to linguistic variables such as word frequency, amount of embedding within sentences and mean number of sentences (Klare, 1974, 1976). Influential variables that determine text difficulty are complexity of syntactical structures, vocabulary size, sentence length and idea units in the text, while other factors also need to be taken account such as interactions between the text and strategies, content and formal schemata, cultural schemata, and specific background knowledge (Kadota & Noro, 2001; Ikeno, 1996).

A variety of text document readability means have been presented such as Flesch Kincaid Grade Level, Flesch Reading Ease, ARI (Automatic Readability Index), and Fry Graph. As indices of text difficulty suggested by Flesch, the number of characters/words/sentences, the average number of characters/syllables per word, and the average number of words per sentence are generally taken into account. Moreover, Klare (1974) proposes that “2 simple variables of word length and sentence length are sufficient to make relatively good predictions of readability” (p. 97). It indicates that shorter words are most likely to be more frequent and common words, whereas shorter sentences are less likely to include complex structures such as subordinate clauses, and embedded clauses. It leads to the assumption that vocabulary level and syntactic complexity/sentence structure are likely to be two influential factors in terms of text difficulty.

In terms of vocabulary, Nation and Coady (1988) propose that vocabulary is an important factor in assessing readability. Nation (2001) proposes the most frequently used 2,000 words are the most appropriate borderline for learners of English who design to go on to an English-medium university. As this number is measured in terms of ‘word families’, that is, inflections and derivatives are counted as one word, it nearly corresponds to the 3,500–4,000 words in *shidouyouryou*, i.e., the Japanese government guidelines for teaching issued by the Ministry of Education, Cultures, Sports, Sciences and Technology, which calculated inflections and derivatives as independent words.

In terms of syntactic complexity, Ortega (2003), in a synthesis study of syntactic complexity measures of L2 writing, analyzed twenty-one cross-sectional studies and focused on the six most frequently used complexity measures. Ortega (2003) addresses that the length of clauses or phrases and the number of subordinate and coordinate clauses are clues to the measurement of syntactic complexity.

However, readability formulae are neither the most appropriate indices nor are they reliable predictors of comprehension for individual readers. Klare (1976) warns "careful human judgment must always be added" (p. 147), as at higher grade levels scores are not reliable owing to background or content knowledge and reader's competence.

## 2.2 Strategy Use in text difficulty

Mokhtari & Sheorey (2002) categorize 30 strategies into three groups, i.e., global reading strategies, problem solving strategies and support reading strategies, based on their extensive research. They suggest problem-solving and support strategies as useful categories in explaining reading strategies, where problem-solving strategies refer to "localized, and focused techniques when problems develop in understanding textual information" such as rereading, changing reading speed, and skipping unknown parts (p. 4), and support strategies refer to "basic support mechanisms intended to aid the reader in comprehending" such as taking notes or consulting dictionaries (p. 4).

According to empirical studies, there are three characteristics that distinguish good readers from poor readers. First, good readers use interactive processes, combining top-down processes with bottom-up processes to read texts globally and locally. Decoding processes are rapid and almost automatic. In contrast, poor readers often focus on texts locally (Carrell, 1989). Deficiencies in the decoding processes leave poor readers with fewer cognitive resources for comprehension operations (Stanovich, 1980). Sometimes the "poor reader might actually rely more on higher-level contextual factors" (Stanovich, 1980, p. 36) to compensate for low proficiency. A second characteristic is that good readers do not rely on L1 translation. In contrast, poor readers require word-for-word translations (Mokhtari & Sheorey, 2002). Third, good readers use cognitive reading strategies such as integration, inference, and background knowledge to extract meaning from text. However, not all readers who use such strategies are good readers (Yamashita & Yokoyama, 2011).

In L1, Kletzien (1991), recruiting 10th- and 11th- grade American students, uses three passages of increasing difficulty. Kletzien (1991) argues that both good and poor readers use the same type and number of strategies when they read an easy passage, but as the difficulty of the passage increases, good readers use a variety of strategies more constantly than poor readers in comprehension processes, analyzing students' reflection on the strategy use (p. 79). In ESL contexts, Anderson (1991), recruiting Spanish-speaking college-level students in the U. S. A., suggests that the types and frequency of strategy use does not change with increasing difficulty based on the analysis of think aloud protocols and processing categories.

However, as for EFL Japanese learners, few studies have examined how both factors, i.e., text difficulty and proficiency/ or reading abilities, affect frequency of strategy use in a few decades (Iijima, 1996; Kihara, 2008; Midorikawa et al., 2001). Midorika et al. (2001), recruiting 301 Japanese EFL learners, examined strategies they believe they used. Later they selected 36 participants among them and conducted think aloud protocols to examine what strategies they used, depending on the proficiency level, using two texts of differing levels of difficulty. The results revealed high-level learners used bottom-up strategies such as translation and vocalization as text difficulty increased, whereas they used top-down strategies such as activating background knowledge and inferring with the easy text. Intermediate-level learners employed the greatest number of strategies among the three groups with increasing difficulty but their strategies did not help their comprehension so much. Beginning level learners were not able to use top-down strategies for comprehension as the text difficulty increased.

Reflecting on the previous studies, there are limitations of the materials they used for their studies. First, regarding Kletzien (1991), three texts she used for poor and good readers vary between poor readers and good readers. Poor readers read the text with lower readability than good readers.

Anderson (1991) used standardized reading comprehension tests as an easy text and academic tests as a difficult text. Midorikawa et al. (2001) used English proficiency tests with differing levels. It is not ascertained how two types of text differ linguistically based on objective criteria, although they attempted to adjust text types. Moreover, they are unable to control for other factors such as content variable and structure organization, which are more likely to interact readers' comprehension processes.

In this study, I revised the original text, with a few corrections, into a difficult text and revised it into the easy version in terms of syntactic complexity and vocabulary level in order to control for content and structure organization as well as linguistic factors. Quantitative methods were used in this study to examine general tendency of strategy use at differing level of reading abilities (high, intermediate, low). Do the frequency of strategy use differ in three groups, as the text difficulty increases as Kletziten (1996) and Midorikawa et al. (2001) report?

The research questions addressed in this study are as follows:

1. Are there any significant differences in frequency of strategy use related to reading abilities?
2. Are there any significant differences in frequency of strategy use related to text difficulty?

### 3. Research Methods

#### 3.1 Subjects

At the initial stage, the number of the subjects who participated in the study was 64. They were 1<sup>st</sup> year, 2<sup>nd</sup> year, 3<sup>rd</sup>, and 4<sup>th</sup> year students majoring in Business Administration, Social Studies, Law and English Literature at a 4-year private university in a provincial city, and two 3<sup>rd</sup> and 4<sup>th</sup> year students majoring English education at a national university in a middle-sized city. The final number of the subjects who participated in the two reading tests was 52. They were divided into three groups, i.e., the high-level group (henceforth HG):  $n = 16$ , the intermediate-level group (henceforth IG):  $n = 20$ , and the low-level group (henceforth LG):  $n = 16$ , based on the total scores of two reading tests (see Table 1). The scores of 28 participants who took TOEIC (Listening and Reading) were in the range of 320 – 955; whereas the scores of 24 participants who took TOEIC Bridge (Listening and Reading) were in the range of 130 – 138, equivalent to TOEIC scores of approximately 345 -390, based on the conversion table issued by the English Testing Service.

#### 3.2 Procedures

Two passages with easy and difficult versions in terms of syntactic complexity and vocabulary level were distributed to 64 Japanese college students during the author's English classes or after the class. First, they answered a difficult version in 45 minutes, followed by a 10-minute questionnaire to ask what reading strategies they used while answering the reading test. Three months later, they answered an easy version in 45 minutes, and responded to the same 10- minute questionnaire. The three months' interval between the two tests is regarded as an appropriate period to control for the relay effect. Most respondents answered the questions within 15 minutes, although they were allowed to take as long as they needed to complete the entire questionnaire.

In terms of comprehension questions, there were 11 questions for each passage. Therefore, for each set of easy and difficult versions comprised of two passages, there are 22 questions. For each passage, there were eleven comprehension questions: 5 literal questions, 2 inferential questions, 3 anaphor questions asking what specific referents refer to, and 1 question concerning the topic of the passage. All the questions were scored using a 2-point scale -- 0 or 1; 0 for a wrong answer; 1 for a correct answer. Two raters scored the answers and interrater reliability was checked, using Pearson's coefficient correlation (98 % for easy texts and 95 % for difficult texts). After discussing the

few differences, all the disagreements were resolved.

In terms of a questionnaire to ask about the strategy use, a 34-item questionnaire was distributed to the students just after they took the reading test. This questionnaire was designed to examine the difference in strategy use between the easy and difficult text. Question items are referred to a previous study (Ikeda & Takeuchi, 2000). Subjects chose one scaling response from a five-point Likert scaling 1- Do not use the strategy at all, 2 - Seldom use the strategy, 3 - Sometimes use the strategy, 4 - Often use the strategy, and 5 - Always use the strategy.

### 3.3 Materials

The two passages were selected from Japanese private college entrance examinations. The original passages of 'Eating out' and 'Mobile phones', were used as difficult versions with only a few minor changes to the originals. The easy versions of the same passages were composed in terms of vocabulary level and syntactic complexity by the writer with the help of a native speaker. The appropriateness of question items and two differing level of versions were checked by two English teachers.

Table 1 shows readability and coverage of vocabulary level of the two passages. The two passages in each version of easy (E) and difficult (D) format had similar levels of readability, e.g., the percentage of the 1000, 2000, and 3000 frequent word level, and the word number. Regarding topic familiarity, both passages are likely to have similar familiarity, dealing with a British social life. 'Eating out' describes the social change of the beginning of eating out by British people, whereas 'Mobile phones' describes newly emerged social rules to use mobile phones in Britain.

**Table 1.** *Easy and Difficult Passages: Readability and Coverage of the Total Number of Words*

Topic	Eating out		Mobile Phones	
	E	D	E	D
Words	392	425	413	437
FRE	60.78	41.76	61.87	45.74
FKGL	8.68	11.83	8.53	11.76
Level 1 (%)	87.76	81.18	82.78	76.79
Level 2 (%)	6.61	5.90	8.85	7.81
Level 3 (%)	2.04	5.90	2.15	6.12
Outside (%)	4.59	7.03	6.22	9.28

Note: FRE: Flesch Reading Ease, FKGL: Flesch Kinkaid Grade Level

Level 1: the most frequent 1,000 words; Level 2: the second most frequent 1,000 words; Level 3: roughly 800 of the most frequent words found at secondary & university level; Outside: all the words beyond the three frequent levels (From Frequency Level Checker by Joyce Maeda, Tokyo International University)

## 4. Results

### 4.1 Results of Reading Tests

Table 2 indicates the results of reading scores; easy, difficult, and total of easy and difficult tests. One way ANOVA was conducted to examine the difficulty of two versions. For the easy version, there were significant differences in the scores of the reading test between the three groups ( $F(47) = 54.466, p < .001, HG > IG > LG$ ). For the difficult version, there were significant differences in the scores of the reading test between the three groups ( $F(47) = 69.621, p < .001, HG > IG > LG$ ). For the total scores of both tests (D + E), the results also showed significant differences between the three groups ( $F(47) = 128.866, p < .001, HG > IG > LG$ ). It indicates that there are clear differences in the difficulty of two texts (E and D) for all the three groups. Moreover, the results of comprehension tests are correlated

to the level of reading ability by the three groups.

**Table 2.** *The Results of Reading Tests: Scores & Correct Percentage: Easy (E) and Difficult (D) Version* N = 52

Level	LG* (n =16)			IG* (n =20)			HG* (n = 16)		
	D (/22)**	E ( /22 )**	D + E (/44)**	D	E	D + E	D	E	D+ E
M	6.69	9.81	16.50	10.10	12.80	22.90	15.63	17.69	33.31
(SD)	(1.66)	(2.14)	(2.71)	(1.65)	(1.61)	(1.59)	(2.83)	(2.30)	(4.69)
%	30.41	44.59	37.50	45.91	58.18	52.05	71.05	80.41	75.70

Note: \*LG: low-level group, IG: intermediate-level group, HG: high-level group, \*\* the total scores

#### 4.2 Results of Strategy Use

Two way ANOVA was conducted with the mean scores of all 34 strategies. Significant main effects were not found in Group,  $F(2, 49) = 1.495, p = .234, \eta^2 = .33$ ; and Text Type,  $F(1, 49) = 0.056, p = .813, \eta^2 = .00$ . The interaction of Group x Text Type was not found,  $F(2, 49) = 1.148, p = .326, \eta^2 = .05$ . Group variable was more influential than Text type, while there are no significant differences in the mean scores of frequency of strategy use.

Let us turn to each strategy in three categories, i.e., local, global and other strategies that are notable. Table 3 indicates mean scores and standard deviations of frequency of strategy use. Table 4 shows results of two way ANOVA with mean scores of strategies that demonstrated significant differences in the main effects and the interaction effect of either or both variables (Group and Text Type).

As for local strategies, there were no significant mean effects and interaction effects in all the local strategies for three groups. Regarding the mean scores, most of the mean scores by HG and IG increased slightly except No. 1 ‘Word-for-word translation’, whereas mean scores by LG decreased slightly with increasing difficulty. Note that mean scores of No. 6 ‘Being aware of grammatical segments’ by LG, IG and HG showed the highest in all the local strategies with both easy and difficult text. Mean score of No.6 by the high-level group increased as the text became difficult and showed the highest with the difficult text, whereas the low-level group decreased mean scores as text difficulty increased and showed the lowest with both easy and difficult text. However, the significant main effect with mean scores of No. 6 was not found in Group,  $F(2, 49) = 1.471, p = .0240, \eta^2 = .26$ ; and Text Type,  $F(1, 49) = 2.124, p = .151, \eta^2 = .04$ . The interaction of Group x Text Type was not found,  $F(2, 49) = 2.372, p = .104, \eta^2 = .10$ .

**Table 3** *Mean Scores With Standard Deviations of the Frequency of Strategy Use*

Category	Easy Version			Difficult Version		
	LG	IG	HG	LG	IG	HG
<b>Local Strategies:</b>						
1. Word-for-word translation	2.81 (0.91)	2.90(0.79)	2.63(1.02)	2.75(0.86)	2.55(0.51)	2.56 (1.09)
6. Being aware of grammatical segments	3.44 (1.15)	3.75(0.91)	3.63(0.96)	3.38 (1.02)	3.80(0.77)	4.13(0.81)
9. Marking grammatical segments	2.80 (1.05)	3.20(1.24)	2.00(1.15)	2.87 (1.09)	3.25(1.39)	2.44 (1.55)
25. Being aware of grammar rules	2.94 (1.00)	2.42(0.88)	2.56(1.03)	2.75 (0.86)	2.79(0.83)	2.63(1.02)
26. Being aware of structures	2.81 (0.98)	2.58(1.14)	2.56(1.21)	2.56 (0.81)	2.79(1.20)	2.88(1.31)

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<b>Global Strategies:</b>						
20. Inferring main points	2.94 (1.00)	2.63(0.81)	3.31(0.70)	2.81(0.83)	2.74(0.71)	3.63(1.26)
21. Inferring the writer's intention	2.69(0.79)	2.58(0.82)	3.13(0.96)	2.44(0.89)	2.63(0.81)	3.44(0.96)
24. Understanding topic sentences	2.69(0.70)	2.74(0.71)	3.00(0.89)	2.50(0.82)	2.16(0.67)	3.00(1.03)
29. Inferring unknown words	3.31(0.87)	3.58(1.14)	4.00(0.73)	3.19(1.11)	3.74(0.78)	4.13(0.89)
30. Inferring sentences	3.19(0.91)	3.63(1.04)	3.69(0.87)	3.06 (0.85)	3.74(0.96)	4.13(0.81)
31. Predicting what will come next	2.75(1.00)	2.67(1.00)	3.25(0.77)	2.56(0.89)	2.50(0.74)	3.38(1.20)
32. Linking the contents with BG*	2.94(1.12)	2.74(1.21)	3.75(0.86)	2.75(1.06)	2.95(1.10)	3.56(1.03)
33. Imaging and visualizing	2.94(0.85)	2.74(1.07)	2.81(1.33)	2.50(0.89)	2.63(0.93)	3.00(1.26)
<b>Notable Strategies</b>						
3. Translating parts that U**	3.56(0.96)	3.40(0.88)	2.50(0.89)	3.25(0.86)	3.70(0.92)	2.81(1.11)
5. Understanding the text in English	2.13(0.88)	2.85(1.18)	3.31(1.30)	1.86(0.80)	2.80(1.15)	3.31(1.25)
12. Changing reading speed (P)***	2.81(1.05)	3.00(1.34)	4.19(0.83)	2.94(1.00)	3.25(1.12)	4.25(0.86)
13. Repeatedly reading parts that U (P)	3.00(0.73)	3.05(1.00)	3.75(0.86)	3.31(0.70)	3.30(0.98)	4.19(0.98)
14. Repeatedly reading words & Paragraphs (P)	2.56(0.73)	2.65(0.93)	3.31(1.01)	2.94(0.77)	2.50(1.00)	3.44(1.15)
17. Skipping words that U (P)	3.25(0.58)	3.90(0.72)	3.13(0.81)	3.38(0.89)	3.90(0.91)	3.50(0.97)

Note. Parentheses indicate standard deviation.

\*BG: background knowledge, \*\*U: I don't understand, \*\*\*problem-solving strategies

As seen in Table 4, in global strategy category, Nos. 20, 21, 29, 30, 31 and 32 showed significant main effects with mean scores only in Group (HG>IG, HG>LG), whereas No. 24 'Understanding topic sentences' showed a significant main effect with mean scores only in Text Type (E>D). There was no interaction of Group x Text Type. Note that the low-level group showed slightly higher mean scores than the intermediate-level group regarding inferring, predicting, activating background knowledge and understanding topic sentences (No. 20, No. 21, No. 24, No. 31, No. 32 and No. 33) either or both texts, although there were no significant differences. IG showed considerable high mean scores of inferring strategies (No. 29 and No. 30) with both texts.

As for problem-solving strategies such as No. 12 'Changing reading speed', No. 13 'Repeatedly reading parts that I don't understand' and No. 14 'Repeatedly reading words and paragraphs', HG showed remarkably higher mean scores than LG and IG. As for No. 3 'Translating parts that I don't understand', the significant main effect was found in Group, and the interaction of Group x Text Type was also found (see Table 4).

Table 4. Results of Two Way ANOVA (Group: G and Text Type: T)

		No.20	No.21	No.24	No.29	No.30	No.31	No.32	No.3	No.5	No.12	No.13	No.14	No.17
G	<i>F</i>	4.918	4.375	3.121	4.965	3.950	3.878	3.686	5.241	7.009	9.000	5.509	4.083	3.998
	<i>df</i>	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)
	<i>p</i>	0.011*	0.018*	0.053	0.025*	0.026*	0.027*	0.032*	0.009*	0.002*	0.001*	0.007*	0.023*	0.025*
	$\eta^2$	0.54	0.95	0.29	0.97	0.52	0.68	1.10	1.21	2.43	2.22	1.18	0.97	0.53
T	<i>F</i>	0.559	0.038	4.211	0.218	1.780	0.150	0.291	1.005	0.941	1.761	11.121	1.141	1.972
	<i>df</i>	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)	1 (49)
	<i>p</i>	0.458	0.692	0.046*	0.642	0.188	0.505	0.592	0.321	0.337	0.191	0.002*	0.291	0.167
	$\eta^2$	0.01	0.00	0.09	0.01	0.02	0.01	0.01	0.02	0.03	0.04	0.23	0.03	0.03
G**	<i>F</i>	0.936	2.847	1.877	0.628	2.444	0.785	1.704	4.276	0.574	0.252	0.313	1.928	0.863
	<i>df</i>	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)	2 (49)
x	<i>p</i>	0.399	0.068	0.164	0.538	0.097	0.462	0.193	0.019*	0.567	0.779	0.733	0.156	0.428
	$\eta^2$	0.04	0.12	0.08	0.04	0.06	0.03	0.07	0.17	0.03	0.01	0.01	0.10	0.04

Note. \* indicates significant differences at the <.05 level.

\*\*G x T: interaction of Group and Text Type

## 5. Discussion

Let us now address each of the research questions with reference to the study results.

1. Are there any significant differences in frequency of strategy use related to reading abilities?

Yes. There are significant differences in frequency of strategy use related to reading abilities (low, intermediate and high) regarding global and problem-solving strategies. As for local strategies, there were no significant differences between the three groups with both easy and difficult text. Most of the frequency of strategy use by three groups showed similar mean scores. The low-level group used strategies slightly more than the other two groups with the easy text, probably owing to their insufficient linguistic abilities. In contrast, the high-level group did not use local strategies so frequently, owing to more automatic and rapid decoding processes than the other two groups (Grave, 2009).

As for global and other strategies, there were significant differences in frequency of strategy use between the groups. The high-level group mostly showed the highest mean scores of strategies among the three groups with both texts. It is assumed that the high-level group used their cognitive resources for activation of global strategies successfully. In contrast, it is likely that the low-level group was not able to reach the linguistic threshold level necessary to use those strategies. They may not know when and how to use strategies owing to low linguistic and reading abilities. However, the finding revealed that low-level group might rely on the context to compensate for their reading deficiencies (Stanovich, 1980). The intermediate-level group used some inferring strategies almost as much as the high-level group, but it did not contribute to their comprehension as effectively. Regarding problem-solving strategies, the high-level group markedly used strategies with both texts.

2. Are there any significant differences in frequency of strategy use related to text difficulty?

No. Regarding local, global and notable strategies, there were few significant differences in mean scores of the frequency of strategy use as the text difficulty increased. It is likely that Japanese EFL learners seldom change the strategy use that they have acquired, depending on the difficulty of the text.

If L1 children develop controlled processes into automatic ones, they might be able to allocate more cognitive processing resources for other important processes to understand the text (LaBerge & Samuels, 1974). Japanese EFL learners, whose decoding processes are not automatic like L1 children, may be restricted in using cognitive strategies effectively owing to limited cognitive resources and/or limited linguistic abilities.

Unlike the previous studies (Iijima, 1996; Kleitzen, 1996; Midorikawa et.al, 2001), this study

revealed that text difficulty did not significantly affect frequency of strategy use by Japanese EFL learners, although there were slight changes. The high-level and intermediate-level group slightly increased basic local strategies with the increasing difficulty, whereas the low-level group decreased frequency of strategy use regarding local strategies and global strategies. The difficult text was too difficult for the low-level learners. The easy text might be too easy for the high-level learners.

## 6. Conclusion and Further Implications

This study indicates that strategy use by Japanese EFL college learners is greatly affected by reading abilities, not by text difficulty, although the effects of text difficulty can not be ruled out entirely. First, it might be due to their insufficient reading/linguistic abilities. Researchers have examined when readers are able to start succeeding in cognitive processes as well as or more than linguistic processes. Employing reading strategies, which needs cognitive operations, may be activated efficiently once the EFL Japanese learners have passed a certain linguistic threshold level (see Alderson, 1984). Even the high-level learners, who have done so, do not reach automatic decoding processes. They may be restricted in using cognitive strategies effectively owing to limited cognitive processing resources (see LaBerge & Samuels, 1974). Second, it might be their limited reading environment as EFL learners. Unlike native speakers who have ample opportunities to read a variety of reading books, most of the Japanese EFL learners read English texts for learning in class. They attempt to employ consistent strategy use when they are exposed to English text as they are told in class. However, more profound studies should be conducted.

Regarding strategy use depending on the reading abilities, findings revealed that high-proficiency learners were able to employ global and problem-solving strategies for better understanding to "free capacity for higher-level processes" (Stanovich, 1980, p. 36). In contrast, low-level learners are assumed not to know when and where to use strategies owing to insufficient linguistic abilities. However, the low-level group's higher mean scores of some global strategies compared with the intermediate-level group indicate they might rely on top-down processes to compensate for their deficiency of decoding processes, whether they succeed or not. Mean scores by the intermediate-level group showed somewhere between the low-level and high-level group. High mean scores of inferring and skipping strategies by the intermediate-level group might not contribute to their comprehension as well as high-level group. The most marked strategies that distinguish the high-level group from the other two groups are problem-solving strategies, i.e., adjusting reading speed and repeatedly reading parts of the text. It is assumed that these strategies are 'developed strategies' that have been acquired through many years' experiences of reading exercises and training in order to achieve better comprehension.

In future, qualitative research into, for example, think aloud protocols, should be conducted to examine participants' individual reading processes. More extensive studies should be administered by using texts with differing levels, to investigate how the text affects strategy use.

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