An Analysis of Difficulties in L2 Reading:
With Reference to Reading Ability

OKUMURA Nobuhiko　　and MIYAMOTO Yumiko

The aim of this study is to find out what factors cause difficulty in reading expository texts in L2 and to examine whether difference in reading ability affects difficulties learners have in reading. In this research 49 Japanese high school learners of English took a reading comprehension test and then answered a questionnaire on difficulties they had had in reading. As a result of factor analysis, five factors were identified. Some factors relate to L2 reading in general, and others appear specific to the reading of expository texts. Based on the results of the reading comprehension test the participants were divided, and factor scores of the upper and lower groups were compared. The result showed that difference in reading ability did not affect difficulties learners had in reading.

1. Introduction

Reading instruction in English classes in Japan has focused mainly on teaching how to read texts to be a good reader, but it tends to lack the notion of finding out the difficulties students have while reading. Establishing what kind of difficulty learners actually have may give suggestions for reconsidering reading instruction.

Reading is generally viewed as involving two sets of processes: lower-level processes and higher-level processes (Grabe & Stoller [5]; Nassaji [11]). According to Grabe and Stoller [5], the lower-level processes represent lexical access, syntactic parsing, semantic proposition formation, and working memory activation. On the other hand, the higher-level processes involve text model of comprehension, situation model of reader interpretation, background knowledge use and inferencing, and executive control processes. Although top-down view models considering higher-level processing to be important attracted attention in L2 as well as in L1 reading studies since the late 1970s, current studies of L2 reading models have discovered that the role of lower-level processing is essential to efficient reading in the framework of interactive reading models (Eskey [2]; Grabe [3]; McLaughlin [8])

Lower-level processing primarily involves recognition of letters and words (Stanovich [14]), and is a linguistic process in which words are accessed automatically (Segalowitz, Poulsen & Komoda [13]). Since skilled readers need only a small amount of cognitive load in lower-level processing, they can concentrate on higher-level processing using the context and their existing background knowledge (Eskey [2]; Samuels & Kamil [12]). On the other hand, less skilled readers, who are deficient in linguistic abilities such as word recognition and grammar knowledge, have to allot a large amount of cognitive resource to lower-level processing (Horiba [6]; McLaughlin, Rossman, & MacLeod, [9]). As a result, comprehension may be hindered as little attention capacity is left for higher-level processing (Akamatsu [1]).

Iijima [7] examined the difficulties Japanese EFL learners face in reading expository texts.

*1　Professor, Department of General Education

*2　Teacher, Nagano Prefectural Ueda Someyaoka
　　Senior High School

One hundred twelve high school students responded to a questionnaire that used 1-5 Likert Scale. As a result of factor analysis, 5 factors were identified. They were (a) Integration of Textual Information, (b) Eagerness for Learning English, (c) Use of Schemata, (d) Understanding Abstract Words and Concepts, and (e) Attitudes towards the Content of a Passage. It was suggested that researchers should focus on affective aspects as well as top-down and bottom-up processing skills in teaching EFL learners how to read expository texts.

Miyamoto and Okumura [10] had 117 Japanese high school students read three expository texts in English and answer multiple-choice questions designed to check their reading comprehension. Immediately afterwards, the students were required to write down what they thought prevented them from comprehending the texts. Descriptions about difficulties in reading were extracted from the obtained protocols, and were classified into 27 items. Based on the results of the multiple-choice questions, the students were divided into the upper and the lower level groups. In each group, the descriptions about reading difficulties were categorized according to the 27 items, and frequency of each item was calculated. The five most frequent items were (a) lack of vocabulary, (b) being reluctant to read a long passage, (c) having difficulty in translating English into Japanese, (d) being unable to understand difficult sentences, and (e) being unable to understand the whole passage. There was no statistically significant difference in frequency between the upper and lower level groups except in the item 'being unable to pronounce words.'

This study was intended to observe reading difficulties learners described with their own words. Iijima [7] also used a questionnaire to examine difficulties learners encountered. From both studies with Japanese high school students as participants, various kinds of reading difficulties were detected, and these difficulties seem to be involved both in higher- and lower-level processes. Hence, it seems necessary to examine difficulties learners actually have,

using a questionnaire with reference to the two sets of reading processes.

2. Method

2-1 The purpose of the present study

Based on Miyamoto and Okumura [10] and Iijima [7], the purpose of the present study is to create a questionnaire with items asking what makes L2 reading difficult with reference to higher- and lower-level processes defined by Grabe and Stoller [5], and to explore difficulty-causing factors when L2 learners read expository texts. Features of the factors are also examined according to reading ability.

The following research questions were addressed in this study:

RQ1. What factors cause difficulty in reading expository texts in L2?

RQ2. Does difference in reading ability affect difficulties learners have in reading?

2-2 Participants

Two elective classes of advanced English at a high school in Nagano, Japan participated in this study. The participants were second-year-students, and the total number was 49 (22 boys and 27 girls). Their English proficiency level was almost average for their age-group, though the name of the class was 'Advanced English.'

2-3 Questionnaire

Twenty seven items of reading difficulties were identified in the learners' descriptions in Miyamoto and Okumura [10]. Based on this and other studies (e.g., Iijima [7]), a questionnaire of 40 items of reading difficulties was created (see Appendix). The 40 items consisted of 8 categories of 5 items. These 8 categories represent the reading processes proposed in Grabe [4] and Grabe and Stoller [5]. Of the eight categories, lexical access, syntactic parsing, semantic proposition formation, and working memory activation, are grouped as lower-level processes. The other four, text model of comprehension, situational model of reader interpretation,

background knowledge use and inferencing, and executive control processes, are grouped as higher-level processes. Examples were added to some items to make them clearer.

Each item was followed by a five-point scale, where point 1 represented 0%, point 2 represented 25%, point 3 represented 50%, point 4 represented 75%, and point 5 represented 100%. It was explained to the participants that point 1 meant "I don't have such difficulty," while point 5 meant "I do have such difficulty." Prior to the experiment, one of the authors had 84 students from another school read the items to check if the wording of each item was understandable. Some items were revised based on their comments.

2-4 Reading comprehension test

Before the questionnaire was administered, a reading comprehension test was given to the participants to have them exposed to expository texts, and to divide them into the upper and lower level groups.

The reading test consisted of four expository texts. Each text was followed by five multiple choice questions, with a possible full mark of 20. The titles were deleted when the texts were given. The details of the texts are as follows:

Text 1: The text 'Plastic vs. Cloth' was taken from *Eiken Jun 2 Kyu Yosoumondai Doriru*, a selection of pre-second grade STEP level tests (Oubunsha, 1994). The type of rhetorical organization was comparison.

Text 2: The text 'Two-for-one' was taken from the pre-second grade STEP test carried out in fall of 2002. The type of rhetorical organization was problem-solving.

Text 3: The text 'A New Kind of Tax' was taken from the second grade STEP test carried out in fall of 1997. The type of rhetorical organization was problem-solving.

Text 4: The text 'Memory' was taken from the second grade STEP test carried out in spring of 1997. The type of rhetorical organization was comparison.

2-5 Procedure

The reading comprehension test was administered by one of the authors. Texts 1 and 3 with multiple-choice questions were given to one class in the first period and to the other in the second period on the same day. Texts 2 and 4 with multiple-choice questions were given to each class in the same way one week later, followed by the aforementioned questionnaire on reading difficulties. Thus, in each test two texts with different types of rhetorical organization from two grades were given. Before each test the participants were given directions as follows: "Read the two texts and answer the following questions. One was taken from a pre-second grade STEP test and the other was from a second grade STEP test. They were all carried out in the past. The results will not be included in your grades, but please try hard." The participants were also required to try to think what kind of difficulties they have while reading and answer the questionnaire afterwards. The time of each test was 20 minutes and the time for answering the questionnaire was 15 minutes.

3. Results and Discussion

3-1 Factors extracted from the results of the questionnaire

In order to explore the underlying factors of L2 reading difficulties, a principal factor method was performed on the 40 items with promax rotation (see Appendix for the means and standard deviations of the scores for each item of the questionnaire). Based on the scree plot, the authors attempted to analyze the data with four to six factors and obtained respective results, and decided that a five-factor solution would be reasonable.

Table 1 shows the factor pattern after promax rotation. In interpreting the results, the pattern matrix using a loading greater than .50 was employed.

The reliability for each factor was .882 (Factor 1), .822 (Factor 2), .833 (Factor 3), .838 (Factor 4), and .698 (Factor 5). These coefficients indicate high internal consistency among the items of

each factor.

Examining the contents of the items grouped in each factor, Factor 1 could be labeled Critical Thinking. The lack of prior knowledge or inability to activate it prevents learners from finding clues to interpret the text. Prior knowledge here could include knowledge of the topic, form, and genre. Even if learners manage to follow the words, they cannot connect what is written to the knowledge they already have, which makes it difficult for them to have their own ideas and interact with the text or the author. Learners cannot think critically. It should be noted that most of the items included in Factor 1 are those of higher-level processes. This shows that learners allot a certain amount of cognitive resource to higher-level processing and have difficulties.

Table 1   Factor Pattern after Promax Rotation (N = 49)

No	Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1 Critical Thinking a .882						
30	It's difficult to read with my own opinion	.724	-.222	-.132	.070	.124
34	I cannot understand the text because I have little knowledge of the topic	.705	-.001	.041	.129	-.001
29	It's difficult to understand the text with active imagination	.704	-.008	.091	.100	.095
33	I cannot connect the text to the information I have	.636	-.230	.268	-.104	.373
40	I don't know what clues I should read with (ex. Words, background knowledge)	.591	.466	-.171	.096	.006
28	I cannot identify the genre (ex. novel, diary, article on science) of the text	.561	.134	.125	.059	-.233
27	I cannot infer what the author implies	.542	.036	.079	.049	-.068
15	I cannot understand a sentence with a conjunction (ex. because, though)	.520	.278	.145	.114	-.213
26	I cannot predict what comes next when I read the beginning of the text	.506	-.096	.231	-.032	.081
Factor 2 Lexical and Grammatical Knowledge a .822						
8	I cannot understand what pronouns or referential pronouns refer to	.285	.707	-.359	.082	-.057
2	I cannot remember the words I learned	-.099	.685	-.007	-.207	.240
35	My background knowledge doesn't help because my English is poor	.086	.619	-.181	.220	.104
5	I cannot pronounce English words	.029	.600	.106	-.265	.046
6	Because of lack of grammatical knowledge I cannot understand the text	-.289	.589	-.130	.273	.257
10	I cannot understand word order unique to English (ex. postmodification)	-.096	.582	.158	.208	-.113
7	I cannot understand the structure of a sentence (ex. Where the verb is)	-.111	.554	.146	.174	-.169
1	I have poor vocabulary	-.230	.517	-.104	.039	.388
Factor 3 Coherence a .833						
16	I come to fail to understand the text while reading on	.081	-.036	.867	-.061	.046
19	I forget the content of the previous paragraph	.075	-.159	.750	.160	-.171
18	I cannot connect the information I have learned from the text to the others	.006	-.114	.730	.267	.180
14	I know each word, but cannot understand the sentence as a whole	.056	-.068	.645	-.074	.149
13	I don't know how the sentence I am reading now is related to the previous one	.098	.057	.556	.067	.161
Factor 4 Text Organization a .838						
23	I cannot recognize what is the most important paragraph in a text	.089	.061	-.147	.790	.117
22	I cannot identify the most important sentence in a paragraph	.172	.038	.101	.649	-.015
24	I don't know which part has the main idea and which part supports it	.342	-.134	.159	.569	.085
Factor 5 Motivation for Learning a .698						
37	If I fail to understand at the beginning, it is difficult to repair it	-.061	.100	.139	.224	.602
32	It's difficult to infer what the author tries to convey	.479	-.038	-.177	-.021	.570
17	It takes time to understand the text	-.106	-.004	.243	.352	.561

Factor 2 could be named Lexical and Grammatical Knowledge. For L2 learners, words and grammar are crucial to understanding the text. Lexical knowledge here includes word meaning, spelling, and pronunciation. Vocabulary size is another problem. Grammatical knowledge includes syntax in general, with learners finding anaphora and word order very confusing. Most of the items included in Factor 2 are from two lower-level processes; lexical access and syntactic parsing. Although these two processes are basically different as Grabe [4] and Grabe and Stoller [5] proposed, the results show that learners tend to integrate them.

Miyamoto and Okumura [10] conducted an open-ended questionnaire to investigate Japanese high school learners' awareness of difficulties in L2 reading comprehension. The results showed that the item with the highest frequency was lack of vocabulary, suggesting that students' attitudes towards vocabulary have great effect on their awareness of difficulty in reading.

Factor 3 could be named Coherence. Learners cannot understand how the sentence they are processing is logically related to the other sentences. They cannot integrate new information with what they have just read in the previous paragraph, and even forget its content. In order to interpret the text, learners need to seize coherence of the text quickly, but in reality they are not able to achieve this. The items included in Factor 3 are from two lower-level processes: semantic proposition formation, and working memory activation. It seems that in order to grasp coherence of the text learners need to connect meaning elements, and make them active and then retain them for further development.

Factor 4 could be labeled Text Organization. Learners cannot identify the main or the most important sentence in a paragraph, nor can they recognize the most significant paragraph in a text. Learners do not appreciate how a paragraph or a text is organized. The items included in Factor 4 are all from one higher-level process: text model of comprehension. Meaning units are built up and well organized to make a text. As learners are processing a text, they are required to develop a set of main ideas for comprehension (Grabe & Stoller, [5]).

Factor 5 could be named Motivation for Learning. When learners have trouble in reading, they may get discouraged and need longer time to finish. They are not flexible enough to revise their strategies. They become less flexible to repair their reading and less motivated, which makes inference difficult when needed. There are three items included in Factor 5. Although they are respectively from three different processes; executive control processes, background knowledge use and inferencing, and working memory activation, what seems to underlie these three particular items is motivation for learning.

3-2 Analysis of factor scores based on the reading comprehension test

After the reading comprehension test was conducted, item analysis was performed. Three items which had negative scores of corrected item-total correlation were excluded. As a result, the full mark of the test was 17. Reliability coefficient (Cronbach's alpha) was .60.

The participants were sorted into two ability groups according to the mean of 6.78. Table 2 shows the means and standard deviations of the upper and lower groups and of the total participants.

The means of factor scores of the upper and lower groups were compared. Table 3 shows the mean factor scores of the upper and lower groups.

Table 2 Descriptive Statistics of the Test Conducted. (N = 49)

	n	*M*	*SD*	*Skewness (SE)*	*Kurtosis (SE)*
Upper group	23	9.39	1.80	0.17 (0.48)	-0.87 (0.94)
Lower group	26	4.46	1.39	-0.54 (0.46)	-0.41 (0.89)
Total	49	6.78	2.95	0.26 (0.34)	-0.84 (0.67)

Note. SE = Standard Error.

Table 3   Mean Factor Scores on Reading Comprehension Test of the Upper and Lower Groups

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Upper group	-0.13	-0.05	0.03	0.19	0.84
Lower group	0.11	0.44	-0.02	-0.17	-0.07

In order to see if there was any difference in factor scores between the upper and lower groups, a t-test was performed with the alpha level set at 1% by Bonferroni's adjustment, but this found no significant difference (t (47) = -0.081, p = .936 for Factor 1; t (47) = -0.331, p = .742 for Factor 2; t (47) = .173, p = .863 for Factor 3; t (47) = 1.331, p = .190 for Factor 4; t (47) = -0.544, p = .589 for Factor 5). The result shows that there was no difference in reading difficulties between the upper group and lower group learners. Thus, it can be said that when Japanese high school students read expository texts, there is no difference in difficulties they have according to their reading ability. This result is almost the same as that of Miyamoto and Okumura [10].

Among the five factors detected, Lexical and Grammatical Knowledge relates to L2 reading in general. L2 learners especially have difficulty in accessing words and utilizing grammatical knowledge. Motivation for Learning also relates to L2 reading in general. Critical Thinking, Coherence and Text Organization, however, appear specific to the reading of expository texts.

4. Conclusion

From the results of the study with Japanese high school students as participants, we can answer the two research questions as follows:

(1) Five factors that cause difficulties in reading expository texts in L2 were found. They are Critical Thinking, Lexical and Grammatical Knowledge, Coherence, Text Organization, and Motivation for Learning.

(2) Difference in reading ability does not affect difficulties learners have in reading.

As for (2), however, some possibilities are undeniable. First, all the participants of this study belonged to elective classes of advanced English, and were hence almost homogenous in English proficiency. Secondly, the number of participants was 49, which was not a large enough sample. Thirdly, reliability coefficient (Cronbach's alpha) of the reading comprehension test was .60, which suggests that the obtained data should be treated with care.

Further research with more participants with varied L2 proficiency is needed to substantiate these findings.

This study focused only on difficulties in reading expository texts, but learners are supposed to read various types of texts. Further research is, therefore, necessary into examining difficulties learners have when they read other types of text.

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Appendix

Means and Standard Deviations of the Scores for Each Item of the Questionnaire

No	Process	Items	*M*	*SD*
1	Lexical	I have poor vocabulary	3.43	0.94
2	Lexical	I cannot remember the words I learned	3.20	1.10
3	Lexical	I cannot guess the meaning of unknown words	3.69	0.96
4	Lexical	I cannot recognize a word unless I see it several times	2.45	1.08
5	Lexical	I cannot pronounce English words	2.59	1.19
6	Syntactic	Because of lack of grammatical knowledge I cannot understand the text	3.51	1.02
7	Syntactic	I cannot understand the structure of a sentence (ex. where the verb is)	2.59	1.17
8	Syntactic	I cannot understand what pronouns or referential pronouns refer to	2.35	0.78
9	Syntactic	I cannot recognize inflected forms of a word (ex. past participle form of a verb)	2.20	0.87
10	Syntactic	I cannot understand word order unique to English (ex. postmodification)	2.86	1.19
11	Semantic	I don't know where to translate	2.61	1.17
12	Semantic	When some words make a phrase, I cannot understand the meaning.	2.67	1.16
13	Semantic	I don't know how the sentence I am reading now is related to the previous one	2.57	1.02
14	Semantic	I know each word, but cannot understand the sentence as a whole	2.67	1.03
15	Semantic	I cannot understand a sentence with a conjunction (ex. because, though)	2.41	1.00
16	Working	I come to fail to understand the text while reading on	2.84	1.18
17	Working	It takes time to understand the text	3.73	1.11
18	Working	I cannot connect the information I have learned from the text to the others	2.78	0.99
19	Working	I forget the content of the previous paragraph	2.33	1.03
20	Working	I have to read the same part or the same word again and again to understand	3.27	1.17
21	Text model	I cannot get the outline of the text	2.82	0.95
22	Text model	I cannot identify the most important sentence in a paragraph	3.16	1.23
23	Text model	I cannot recognize what is the most important paragraph in a text	3.22	1.20
24	Text model	I don't know which part has the main idea and which part supports it	2.90	1.03
25	Text model	I don't know how the thesis is developed (ex. solving a problem)	3.12	0.95
26	Situational	I cannot predict what comes next when I read the beginning of the text	2.84	1.01
27	Situational	I cannot infer what the author implies	3.10	0.98
28	Situational	I cannot identify the genre (ex. novel, diary, article on science) of the text	2.16	0.94
29	Situational	I cannot infer what the author implies	2.98	1.11
30	Situational	It's difficult to read with my own opinion	3.53	1.04
31	Background	I tend to read a text with a false assumption	3.24	1.23
32	Background	It's difficult to infer what the author tries to convey	2.94	0.97
33	Background	I cannot connect the text to the information I have	2.67	1.05
34	Background	I cannot understand the text because I have little knowledge of the topic	2.96	0.98
35	Background	My background knowledge doesn't help because my English is poor	3.08	0.93
36	Executive	I don't know how accurately I have understood the text	3.61	1.10
37	Executive	If I fail to understand at the beginning, it is difficult to repair it	3.61	1.02
38	Executive	I cannot read on because I'm worried about my poor English	2.94	1.18
39	Executive	I cannot read a text whether I'm interested in the topic or not	2.67	1.16
40	Executive	I don't know what clues I should read with (ex. Words, background knowledge)	3.06	1.23

Note. Lexical = lexical access; Syntactic = syntactic parsing; Semantic = semantic proposition formation; Working = working memory activation; Text = text model of comprehension; Situation = situation model of reader interpretation; Background = background knowledge use and inferencing; Executive = executive control processes.