How does text difficulty affect uses of reading strategies in L2 reading? : a case study

How does text difficulty affect uses of reading strategies in L2 reading? : a case study

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要　　約

本稿は、英語多読における L2 学習者のリーディング・ストラテジー使用に関するケーススタディで
ある。難易度が異なる 7 つのテキストに対し、調査対象の学習者がどのようにストラテジーを変えて
いるか、あるいは変えていないのか、事後報告形式のインタビューを通して検証を行った。調査では、
約 22 万 3000 語の多読経験を持つ大学 1 年生を調査対象とした。分析の結果、テキストの難易度によっ
て、使用するリーディング・ストラテジーには変化があることが確認された。調査対象者にとってテ
キストの難易度が低かった場合には、ボトムアップ処理が「自動化」されており、トップダウン・ス
トラテジーが効率よく運用されていた。一方、調査対象者にとってテキストの難易度が高かった場合
には、ボトムアップ処理の段階で何らかの問題が生じており、トップダウン・ストラテジーの使用が
制限されていた。

1. Introduction

The process of reading is often described as a black box as the process itself is invisible. Recent studies, however, have provided several different models that try to explain the process of reading. Bottom-up models, for instance, explain the reading process as an accumulative understanding, starting from the decoding of smaller units, such as the recognition of a letter, to that of larger units, such as word, sentence, or paragraph understanding. Top-down models, on the other hand, propose that readers utilize their schema, grammar, or semantic knowledge to predict the meaning of words or the structure of sentences, and that the process of reading is often selective. More recent studies, however, have found that neither model is able to explain the reading process perfectly. As a result, models that incorporate both bottom-up and top-down processes have been developed.

From the late 1980s until the early 1990s, research was conducted to identify reading strategies that are characteristic of both good readers and poor readers. Many of the studies concluded that readers who employ top-down strategies read better than those who employ bottom-up strategies. It was found that a good reader pays attention to the overall flow of the text, or focuses on keywords while reading, whereas a poor reader is bound by the individual word decoding process (Negishi in Kanatani, 1995: 50). Hasegawa's research (2006) agreed with these findings as she also found that university student readers who read more books in extensive reading used top-down strategies successfully while those who did not read extensively depended solely on bottom-up strategies despite the fact that explicit instructions on top-down strategies were given in class. Hasegawa argues that those who did not use top-down strategies need to read more books to be able to apply top-down strategies in their reading. Iino (2006) also found that his subjects had difficulty in putting top-down strategies into practice when engaged in extensive reading. His study

found that after one year of instruction including shadowing, extensive reading and reading strategies, university student readers were more aware of the importance of top-down strategies, but found it difficult to apply them in their reading. Iino also found that the readers displayed an increased perception that bottom-up strategies are not effective, but pointed out that the responses to his questionnaire on bottom-up strategies were somewhat inconsistent. Responses to one item suggested that students did not worry about understanding the details of the text so much compared to one year previously (shifting from bottom-up to top-down), but responses to other items suggested that students were more dependent on the use of dictionaries and showed a tendency to focus on individual word meaning (reinforcing bottom-up strategy).

The author also investigated the uses of reading strategies in extensive reading (Kihara, 2008), but found two apparent contradictions to the findings in Hasegawa and Iino's studies. One was that although Hasegawa and Iino found it difficult to put top-down strategies into practice, all of the university students Kihara interviewed were employing top-down strategies, although the frequency and dependency of their use varied according to the students or the books they were reading. However, the use of top-down strategies was common regardless of the amount of reading, or English proficiency level. Another contradictory point was that although Hasegawa found that top-down strategies and bottom-up strategies were characteristic of extensive readers and less extensive readers respectively, the author found that some students changed their reading strategies according to the difficulty of the text they were reading, and that strategies were not used exclusively by each individual reader. More specifically, some students were constantly and consciously translating each sentence, sometimes with the help of a dictionary (bottom-up strategies) when the texts were difficult for them. When the texts were easier for them, however, the same students were not translating, but instead paying more attention to the overall flow of the text rather than the details (top-down). It seems likely that Hasegawa's finding and the author's finding are not actually contradictory, but simply looking at different aspects of reading activities in extensive reading. Since Hasegawa and Iino asked readers how they were reading, respondents probably looked back on their reading style, more or less summarized it, and then replied regarding their most typical reading strategies. These readers, therefore, might have failed to report some other strategies, which were for them a less typical style, but which they may have used when reading a different level of text. The author's more direct observation method, asking a student to think-aloud while reading, one book at a time, probably made it possible to look at the strategy changes within a student more clearly.

The author's hypothetical explanation for these changes of reading strategies within the same reader is that a reader can use automatic reading processing, which allows the reader to skip the translation process when the text level is 'easy' or 'appropriate' for the reader. If the text is 'difficult' or 'inappropriate', the reader is reduced to employing the translation process. The 'difficulty' and 'easiness' or 'appropriateness' and 'inappropriateness' are defined by the individual readers, depending on their English proficiency, the schema they have, or other factors such as interest in the particular text. This explanation, however, is still highly hypothetical, as the number of the observed readers is limited to five. In addition, all of these readers had low English proficiency (4th or 3rd Grade of the STEP test). It is therefore possible that these changes of reading strategies are unique characteristics of this level of readers.

In order to investigate whether the changes of reading strategies are unique to low proficient students, this study examines the uses of reading strategies by a relatively more proficient student (Pre-1st Grade of the STEP test). As well as the types of strategies this reader uses while reading, the study also attempts to explore how the reader changes

or does not change his reading strategies as text difficulty changes.

2. Method

Subject. The subject in this study was a male Japanese sophomore student majoring in English education in a four year national university in Japan. The subject had passed the pre-1st level of the STEP test in the previous year, and could therefore be considered to be of intermediate level in English proficiency. He had been engaged in extensive reading both as a class requirement and as voluntary reading outside class. Before this study, he had read 59,900 words (7 books) in class and 63,432 words (15 books) voluntarily, giving a total of 223,332 words (22 books). The details of the books read are shown in Table 1.

Table 1. Books that the subject had read prior to the study

In class reading		
Levels of books	Number of books	Words
Oxford Bookworms Stage 3	3	28,900
Oxford Bookworms Stage 4	4	31,000
Voluntary reading		
Levels of books	Number of books	Words
Oxford Bookworms Stage 1	2	11,100
Oxford Bookworms Stage 2	4	29,300
Oxford Bookworms Stage 3	1	10,000
Oxford Bookworms Stage 4	1	13,000
Oxford Bookworms Stage 5	1	18,000
Penguin Readers Level 2	3	25,700
Penguin Readers Level 3	1	11,000
Penguin Readers Level 4	1	21,332
Penguin Readers Level 6	1	24,000
Total	22	223,332

Reading materials. Seven different levels of English books were used for this study, as shown in Table 2. Books 1-6 are retold texts, written specifically for L2 learners with their difficulties being classified by the publishers according to head words and grammar used. Book 7 is an authentic text written for native speaker children. According to the YL, or *Yomiyasusa Level*, an indicator for readability, given by SSS Extensive Reading Club (Furukawa et al., 2007), Book 7 is YL 6.0-7.0. As shown in Table 2, the difficulty of the books increases from Book 1 to Book 7. The headwords and grammar used for Books 1- 6 are stated by the publisher, but no such information was released for Book 7.

Table 2. Books used in the study

	Book Title	Head words	Grammar used	SSS YL
Book 1	*The President's Murderer* Oxford Bookworms (Stage 1)	400	present simple present continuous imperative *can /cannot, must* *going to* (future) simple gerunds past simple	2.0-2.2
Book 2	*New Yorkers: Short stories* Oxford Bookworms (Stage 2)	700	[all of the above, plus] present perfect *will* (future) *(don't) have to, must not, could* comparison of adjectives simple time clauses past continuous tag questions *ask/tell* + infinitive	2.6-2.8
Book 3	*The Picture of Dorian Gray* Oxford Bookworms (Stage 3)	1000	[all of the above, plus] *should, may* present perfect continuous *used to* past perfect causative relative clauses indirect statements	3.2-3.4
Book 4	*Little Women* Oxford Bookworms (Stage 4)	1400	[all of the above, plus] past perfect continuous passive (simple forms) would conditional clauses indirect questions relatives with *where / when* clauses of purpose, reason, contrast gerunds after preposition / phrases	3.8-4.0
Book 5	*David Copperfield* Oxford Bookworms (Stage 5)	1800	[all of the above, plus] future continuous future perfect passive (modals, continuous forms) *would have* conditional clauses modals + perfect infinitive *so / such…that* result clauses	4.5-5.0
Book 6	*The Enemy* Oxford Bookworms (Stage 6)	2500	[all of the above, plus] passive (infinitives, gerunds) advanced modal meanings clauses of concession, condition	5.5-6.0
Book 7	*Holes*	—	—	6.0-7.0

Procedure.　The subject was first asked to read Book 1 as he normally reads L2 books. As the subject preferred to read the text aloud, and that was his normal style, the book was read aloud.　After two minutes had elapsed, the subject was asked to stop reading. Immediately after this, the researcher asked the subject about the content of the reading and how he had read or tried to read the text. The same procedure was repeated for Books 2- 7. All of the interviews were recorded and transcribed for further analysis.

3. Findings

In identifying strategies used by the subject, this study referred to the list made by Konishi (in Tsuda College Institute for Research in Language and Culture Dokkai Kenkyu Group, 2002: 217) which built on the study by Carrell (1989). The list classifies reading strategies into two categories: global strategies and local strategies. Since the terms global strategies and local strategies are used synonymously with top-down strategies and bottom-up strategies respectively, this study only uses the terms top-down and bottom-up strategies to avoid confusion. The criteria of these strategies are shown in Table 3. Konishi's list, however, does not include translation processing. Since it is great interest of this study to examine whether there is a change in the subject's use of translation while reading different texts, Table 4 has an independent column to show whether translation had taken place.

The calculated words per minute (WPM) and the types of strategies observed are shown in Table 4. For some books, the subject required extra time to re-read the text in order to gain confidence in his understanding of the text. Since this study intends to compare the time that was needed for the subject to come to an understanding of the text, or the time needed for the subject to feel that he had come to an understanding of the text, this extra time needed should also be considered when calculating WPM. The re-calculated WPM are also shown in Table 4. As for Book 7, the subject was asked to finish reading 32 words that were left in the chapter, so that he would complete the chapter. WPM and re-calculated WPM were obtained by the same procedure as Books 1-6.

Table 3. Konishi's (2002) list for reading strategies [my translation and numbering]

Global strategies (top-down strategies)
① to understand the relationships between the current information and the incoming information (awareness of cohesiveness or coherence)
② to distinguish main points from supporting details (use of knowledge about paragraph structure)
③ to anticipate what will come next in the text (prediction)
④ to utilize one's knowledge and experience to understand the content of the text (utilize schema)
⑤ to be aware of one's understanding of the text (monitoring)
⑥ to question the importance or truthfulness of what the author says (critical reading)
Local strategies (bottom-up strategies)
⑦ to understand the meaning of each word
⑧ to look up unknown words in a dictionary
⑨ to understand grammatical structure within a sentence
⑩ to focus on the details of the content

Table 4. Words per minute (WPM) and types of strategies observed

	WPM	Extra time needed	Re-calculated WPM	Types of strategies observed		
				Top-down strategies	Bottom-up strategies	Translation into L1
Book 1	177 words	—	177 words	②		No
Book 2	161 words	—	161 words	①②③⑤		No
Book 3	165 words	175 seconds	67 words	①③⑤	⑦⑨⑩	Yes
Book 4	160 words	—	160 words	①②③		No
Book 5	155 words	312 seconds	43 words	①③④⑤⑥	⑦⑨⑩	Yes
Book 6	153 words	—	153 words	①②③		No
Book 7	137 words	233 seconds	50 words	①③④⑤⑥	⑦⑧⑨⑩	Yes

4. Discussion

　　The subject tried, on his own initiative, to read the texts aloud as expressively as possible, as he reported doing normally in his L2 reading outside of this study. Although the subject attempted to maintain his reading speed with all the given books, WPM decreased consistently from Book 1 to Book 7. On the other hand, re-calculated WPM (R-WPM) did not decrease as consistently from Book 1 to Book 7. As stated above, the books were classified by the number of headwords and grammatical complexity. It seems that the raw WPM, or the reading aloud speed, was directly related to the number of headwords and grammatical complexity, but the R-WPM, the reading speed needed to understand the content meanings, was not necessarily related to the number of headwords and grammatical complexity. According to the R-WPMs, Book 5 was the most challenging for the subject, followed by Book 7, Book 3, Book 6, Book 4, Book 2, and Book 1. The subject reported that all the books that required extra time (Books 3, 5 and 7) were noticeably more difficult for him than the ones did not require extra time (Books 1, 2, 4 and 6). This result does not coincide with the difficulty levels set by the publishing company. This may be due to the fact that the subject was asked to read only a portion of each book in a set time, and thus the passages read may not necessarily contain a completely representative sample of the book as a whole. In this study, therefore, the difficulty of the texts is defined by the subject's R-WPMs.

　　In order to investigate how the uses of reading strategies change or do not change according to text difficulty, we will now examine in more detail what the subject was doing during the extra reading time. One of the most clear differences between strategies used for Books 1, 2, 4 and 6 (easier books) and Books 3, 5 and 7 (challenging books) is that bottom-up strategies were only used when the subject required extra time, i.e. in Books 3, 5 and 7. The strategies underlined in Table 4 were those strategies most actively used by the subject for each book and, as shown in the

table, all of the bottom-up strategies (reading strategies (RS) ⑦⑧⑨⑩) were actively used during the extra time. The subject reported that he had gone over the text again in order to think more carefully what each sentence meant by remembering the meanings of the words or by analyzing the sentence structures. In order to make this process efficient and successful, the subject had an urge to translate the text into Japanese, especially the part he felt difficult to understand, phrase by phrase. By translating into Japanese, he felt that his understanding had become clearer and his previous confusion had been sorted out. Since the use of bottom-up strategies and translation processing was limited to Books 3, 5 and 7, it appears that bottom-up strategies and translation processing were characteristic strategies for the subject when reading more challenging books.

Top-down strategies were also used during the extra time. In particular, uses of RS ①③⑤ were more frequent for Books 3, 5 and 7 than Books 1, 2, 4 and 6. The subject reported that in the process of understanding the meanings of the words or sentences, he frequently checked the coherence of the story (RS ①) so that he might find some clues for unknown words or troublesome sentences. When he came up with guesses for unknown words or sentences (RS ③), he actively checked whether those guesses fitted the rest of the text; ultimately, if he had solved his understanding problems (RS ⑤). He needed to repeat this process several times with several possible guesses because his guesses often appeared to be wrong or out of context. It seems that RS ①③⑤ (top-down processing) were being activated to complement RS ⑦⑧⑨⑩ (bottom-up processing) in order to achieve the same goal, ie. to clear confusion, especially during the extra time in Books 3, 5 and 7.

The characteristics of the reading process during the extra time in Books 3, 5 and 7 become clearer if we compare them with the processes that took place in Books 1, 2, 4 and 6, the books the subject felt easier to understand. The reading strategy used most frequently for these 'easier' books was RS ③ , a strategy that anticipates what comes next in the text. As discussed in the previous paragraph, RS ③ was also actively used for Books 3, 5 and 7. However, the difference is that the subject felt that the guesses he made in Books 1, 2, 4 and 6 (easier books) were almost always correct whereas many of the guesses made in Books 3, 5 and 7 often seemed to be wrong. As with Books 3, 5 and 7, after making guesses, the subject used RS ① to check whether his anticipation was satisfactory and the story was coherent. The subject felt that his anticipation was correct for most of the time because the stories in Books 1, 2, 4 and 6 proceeded almost exactly as he had anticipated. For some parts, he encountered an exact sentence or expression that he had anticipated he would see next.

These successive correct or satisfactory guesses for the subject seemed to have made the checking processes (RS ⑤) easy and turned into, in effect, a process of confirmation. These confirmation processes were smooth and relatively unstressful for the subject, so that he was able to continue his reading with confidence. In contrast, the guessing and checking processes for challenging books (Books 3, 5 and 7) were stressful and required a longer time as discussed earlier. It seems, therefore, possible to say that wrong or unsatisfactory guessing is one of the significant factors causing the use of extra time for Books 3, 5 and 7.

Another distinctive feature in reading Books 1, 2, 4 and 6 is the use of RS ② , a strategy distinguishing main information from supporting details. RS ② was not used at all when reading Books 3, 5 and 7. For Books 1, 2, 4 and 6, the subject was aware that some parts of the texts were elaborations of the main flow of the story, so that he did not have to understand or remember every detail. He felt that he understood the roles that certain sentences or paragraphs played in the text; the explanations of 'how' intense the situation was (Book 1), 'how' poor the main

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characters were (Book 2), the detailed characteristics of main characters (Book 4), or 'how' one character was in love with another character (Book 6). Instead of making a distinction between main (or significant) information and supporting details (or less significant information), the subject was rather focusing on the details of every sentence or word (RS ⑦⑧⑨⑩) in Books 3, 5 and 7, including not so significant details that he did not actually need to have worried about. It appears that the subject was in a vicious circle where failure to decode details (RS ⑦⑧⑨⑩) successfully discouraged the discarding of less important details (RS ②); he therefore had to struggle to progress through the text, and found his understanding limited to the local level. In other words, the subject used RS ⑦⑧⑨⑩ , and the unsuccessful outcomes of these strategies in terms of text understanding resulted in even more active use of these bottom-up strategies. This reliance on RS ⑦⑧⑨ ⑩ discouraged the use of RS ② and led to further dependence on RS ⑦⑧⑨⑩ . This vicious circle hindered the subject's progress in reading. It seems, therefore, possible to say that another significant factor causing the use of extra time for Books 3, 5 and 7 is the overuse of RS ⑦⑧⑨⑩ (bottom-up strategies) which resulted from unsuccessful use of these strategies.

Why, then, did the subject fail to use RS ⑦⑧⑨⑩ successfully for some books and not for others? Likewise, why was the subject able to make correct or satisfactory guesses (RS ③) for some books but was unable to do so for the others? Both unsuccessful uses of RS ⑦⑧⑨⑩ and RS ③ are derived from the subject's inability to use these reading strategies sufficiently. This suggests that the uses of different strategies for Books 1-7 shown in Table 4 are not necessarily simple reflections of the subject's intention to use reading strategies, but show how the uses of reading strategies were influenced by the subject's 'ability', such as the skills to use RS ⑦⑧⑨⑩ and RS ③ successfully.

For instance, the absence of RS ② in more challenging books was not due to the subject's intention. The subject had been, in fact, instructed in an English class outside this study, not to focus on details (RS ⑦⑧⑨⑩) but to try to concentrate on the main flow of the story. The subject's intention was to follow this instruction, but despite his attempts, he failed to do so. It seems that the limitation of his skills in using RS ⑦⑧⑨⑩ prevented him from using RS ② . During the interview, it became clear that in Books 3, 5, and 7 (challenging books), the subject did not understand the meanings of certain words, expressions and the grammar, and these difficulties significantly lowered sentence decoding speed and accuracy of text understanding. In contrast, for the easier books, the subject was able to decode sentences almost simultaneously with his reading aloud of the text and his understanding was accurate. The difference in these two performances seems to lie in the degree of automatization of the process of decoding (bottom-up process = RS ⑦⑧⑨ ⑩) . Although Table 4 does not show that no bottom-up strategies were used for Books 1, 2, 4, and 6 (easier books), the absence of bottom-up strategies might suggest that the subject's decoding process was so effortless, or automatic, that there was no need to use these strategies. In fact, the subject reported that the meaning of each sentence "came just naturally without even thinking". The subject seems to have achieved "automaticity" in bottom-up processing (RS ⑦⑧ ⑨⑩) for Books 1, 2, 4, and 6, but not for Books 3, 5, and 7.

As for the use of RS ③ , the strategy that predicts the next part of the text, the subject always intended to use RS ③ . This intention is reflected in Table 4. However, as discussed previously, the use of RS ③ was successful for Books 1, 2, 4, and 6, but not for Books 3, 5, and 7. During the interview, it was found that the subject was more familiar with the vocabulary and expressions used in Books 1, 2, 4, and 6 than Books 3, 5, and 7. He reported that he had either seen or used many of the words and expressions in Books 1, 2, 4, and 6 on several different occasions, so that he could think of several hypothetical contexts that could follow these words or expressions. As for Books 3, 5, and 7, however, the subject was not familiar with many of the words or expressions, or even had difficulty in decoding the meanings of

the sentences, as seen in the previous paragraph. His attempted prediction often seemed to have failed for Books 3, 5, and 7 because he had not encountered similar contexts before, giving him only futile guessing options. In short, limited knowledge of vocabulary or expressions seem to have prevented him from using RS ③ successfully.

5. Conclusion

In this study, it was found that a subject with a relatively higher English proficiency changed the uses of reading strategies according to the difficulty of the books. This suggests that an L2 reader may not be simply classified as using only one type of reading strategy, such as bottom-up strategy or top-down strategy exclusively. This study showed that the subject possessed a number of reading strategies including both bottom-up and top-down strategies, but the uses of some top-down strategies were limited or hindered by the ability and attributes of the subject: specifically, whether or not the bottom-up decoding process of the text was automatized; and whether the subject was sufficiently familiar with, or had been exposed to relevant vocabulary or phrases prior to the reading.

Since the study only observed one subject with limited reading samples, the findings should not be generalized. In order to further explore the relationships between strategy use and text difficulty, a larger scale study with more subjects with a variety of reading samples are required. This small scale study, however, suggests that automaticity of bottom-up processing and familiarity with relevant vocabulary and phrases would be a valuable focus for future research.

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