

**READING STRATEGIES FOR
JAPANESE AS A SECOND LANGUAGE:
A STUDY OF ENGLISH AND CHINESE NATIVE READERS**

by

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B.A., Tohoku Gakuin University, 1987

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS**

in

THE FACULTY OF GRADUATE STUDIES

**(Modern Languages Education)
DEPARTMENT OF LANGUAGE EDUCATION
FACULTY OF EDUCATION**

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THE UNIVERSITY OF BRITISH COLUMBIA

May 1995

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ABSTRACT

Research in second languages (L2) has identified that reading in L2 requires a reader to use both top-down processing (e.g., use of background knowledge) and bottom-up processing (e.g., letter processing), and that relying heavily on one type of processing may impede successful comprehension. However, in the area of Japanese as a Second Language (JSL), few investigations have been conducted on strategy use among JSL readers in comprehending Japanese texts. In particular, there is not enough investigation of the validity of the prevalent belief among JSL teachers that a learner who has substantial prior knowledge of Chinese characters (i.e., knows Chinese) comprehends Japanese texts far better than a learner who does not, since Chinese characters are extensively used for content words in Japanese texts. Nevertheless, transferring knowledge of Chinese characters may also be a drawback because some Japanese kanji compounds are not semantically compatible with those in Chinese. Some researchers suggest that knowledge of Chinese characters is not necessarily an advantage for successful comprehension in Japanese (e.g., Hatasa, 1992).

This study examined if there are any differences in reading strategy use between the two language groups of intermediate JSL readers. It also examined the relationship between the application of the knowledge of Chinese characters to solving kanji problems and the readers' overall performance in comprehending Japanese texts. Eight university JSL learners participated in recall tasks of two Japanese passages, verbalising their thoughts during the tasks. Both qualitative and quantitative data from this case study suggest that use of Chinese knowledge does not guarantee Chinese readers successful or superior comprehension of Japanese texts: those readers must be able to identify the

rhetorical structure of the passages and use it when reconstructing mental representations of the passages. Also the results suggest that use of knowledge of Chinese characters has to be accompanied by effective use of metacognitive strategies to maximise its usefulness.

The results indicate that reading instruction in JSL needs to recognise the interactive nature of the reading processes and that the activities that help learners develop effective use of top-down processing and metacognitive strategies should be integrated into their instruction.

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ACKNOWLEDGEMENTS

First of all, I would like to express my deepest gratitude to my thesis committee, Dr. Stephen Carey, Dr. Patricia Duff, and Dr. Richard Berwick, for their critical comments on the manuscript and constructive suggestions.

I would also like to thank Dr. Rebecca Chau and Mr. Masahiko Nakata, who kindly allowed me access to their classes for the recruitment of the participants in this study. I also thank all the participants for their co-operation and time.

I would like to express my gratitude to my former colleagues and mentors, Dr. Chihiro Thomson, Mrs. Sufumi So, and Ms. Chisako Umeda, for their encouragement and guidance during my days in Singapore. What I learned from them in those days did lay the foundation for this thesis. Specially, I am indebted to Dr. Thomson and Mrs. So for giving me the inspiration that ultimately led me to this study.

Finally, I would like to thank Rodolfo Valerio, my husband, for his unwavering support, patience, and love throughout the completion of this thesis. Without his existence, I could never have finished this thesis.

CHAPTER 1

Introduction

During the last two decades, research on reading for second language learners has grown remarkably, initiated by the research in English as a first and second language (ESL hereafter). Consequently, a large number of studies have been conducted to identify how comprehension processes work and what factors are involved in successful comprehension (See Grabe, 1991, for a review of previous research in this field.) Particularly, a significant number of studies on reading strategies has emerged from the investigation of readers' thought processes during task performance (e.g., Anderson, 1991; Barnett, 1988, 1989; Block, 1986, 1992; Casanave, 1988; Cohen & Hosenfield, 1981; Horiba, 1990; Hosenfield, 1976; Sarig, 1987). As a result of previous research, the learner's ability to use strategies has become considered one of the important factors for success in reading comprehension (Anderson, 1991; Barnett, 1988, 1989; Block, 1986, 1992; Casanave, 1988; Cohen & Hosenfield, 1976; Sarig, 1987).

However, despite the steady growth in recognition of reading strategies, little research has been reported within the context of Japanese as a second language (JSL), and it is still not clear what strategies JSL learners employ while attempting to comprehend Japanese texts. In particular, there has not been enough investigation as to the validity of the prevalent belief among JSL teachers, that a learner who has substantial knowledge of Chinese characters comprehends Japanese texts better than a learner who does not, because kanji, which are derived forms of Chinese characters, is extensively used for content words.

This study will attempt to identify the reading strategies used by JSL learners in an intermediate university Japanese course at a Canadian university, and investigate how two groups of readers, English native readers and Chinese native readers, approach the reading comprehension of Japanese texts.

Significance of Problem

The term "reading strategies" refers to "the mental operations involved when readers purposely approach a text to make sense of what they read" (Barnett, 1989, p.66). Reading strategy research has taken on greater importance during the last decade, along with the prevalence of the view that reading comprehension is a type of cognitive activity that requires the readers to use active mental processes for solving problems (Grabe, 1991). Vast amounts of research have been conducted on both first and second languages. Those studies revealed that strategy use may vary from reader to reader (Anderson, 1991; Barnett, 1988; Block 1986; Sarig, 1987), that metacognition plays an important role in effective use of reading strategies (Anderson, 1991; Barnett, 1988; Block, 1986, 1992; Carrell, 1989; Casanave, 1988), and that strategies in the reader's first language (L1) may be transferred into the second language (L2) (Cumming, Rubuffot, & Ledwell, 1989; Koda, 1987, 1988; Sarig, 1987), but the extent of the transfer may be limited depending on L2 competence (Carrell, 1991; Clarke, 1980). In addition, the syntactic and semantic characteristics of the target language may affect the types of strategies that are used by proficient readers (Swaffer, 1988).

In the area of JSL, although there has been a growing interest in reading strategies among teachers (Ozaki, 1991), little research has been conducted on the topic. In particular, few investigations of a reader's strategy use during the accomplishment of a task have been conducted so far. Horiba (1990) observed the reading processes of both L1 and L2 readers of Japanese, and found that L2 readers exercised self-monitoring strategies of vocabulary and sentence comprehension more often than L1 readers. In her study of reading strategy training for the intermediate JSL learners, Taniguchi (1991) reported active use of various strategies, such as word-problem solving strategies and use of general knowledge to assist comprehension, by the JSL learners during the reading tasks. However, in Horiba's study, the presentation of the experimental text to the subjects was far from authentic reading; each sentence was written on an index card so that the subjects could read only one sentence at a time. Therefore, the observed strategy use in that study may be different from that in a more authentic reading situation. Moreover, in Taniguchi's study, the main focus was on strategy training rather than investigating the learner's own reading process during the tasks. Therefore, it appears that further investigation is necessary for an in-depth understanding of reading strategies within JSL settings.

Moreover, few researchers in JSL have investigated the validity of the common belief among JSL teachers about the greater advantage of Chinese readers over non-Chinese readers in comprehending Japanese texts. Many teachers assume that the large number of kanji used in Japanese texts enable readers with a Chinese background to transfer their knowledge of Chinese characters and vocabulary in order to understand the

meaning of unknown kanji words in Japanese texts. For example, the results of Koda's study (1989) showed that learners who have a strong Chinese language background may perform better in complex reading tasks, such as paragraph comprehension, than those who do not. However, there is also some evidence that the knowledge of Chinese characters is not a strong factor in the reader's overall performance in reading comprehension in Japanese, especially for the JSL readers who are highly proficient in Japanese (Hatasa, 1992). In addition, some researchers have suggested that the application of knowledge of Chinese characters and the transfer of vocabulary knowledge in Chinese also may constrain successful comprehension because not all kanji words correspond semantically to those in Chinese (Chou, 1991; Takebe, 1979, 1989).

In addition, although researchers appear to be in agreement about the strong relationship between vocabulary knowledge and comprehension (e.g., Grabe, 1991; Just & Carpenter, 1987; Koda, 1989, 1990), the reader's knowledge of syntactic markers, such as case-marking particles, may also be important to successful comprehension in Japanese since they are the most significant syntactic markers in Japanese language (Koda, 1989, 1990, 1992; Saito-Abbott, 1991). Also, recent research in ESL and French as a foreign language shows the importance of the reader's use of prior knowledge, such as knowledge about the topic and text organisation (e.g., Carrell, 1984, 1987) and the metacognitive ability that one brings to the reading (e.g., Anderson, 1991; Barnett, 1988; Block, 1986, 1992; Casanave, 1988). Therefore, identifying how the JSL readers approach a text during reading will provide some useful insights into Japanese reading instruction. This is especially important for the intermediate level of Japanese learners, because instruction

shifts from conversational language at the beginner level to an in-depth understanding of written texts at the intermediate level (Ito, 1991; Yamamoto, 1989).

Furthermore, it is valuable to study reading strategies used by learners not only in ESL settings but also in other cross-linguistic contexts, with such target languages as Japanese. It appears that the studies in L2 reading are dominated by those in ESL. However, some researchers have suggested that the characteristic features of a target language might influence the reading processes in the language. As a consequence of reviewing some studies of L1 readers of English and also with respect to Bernhardt's study (1986, cited in Swaffar, 1988) of L1 and L2 readers of German, Swaffar (1988) pointed out that German requires its readers to use different optimal processing strategies from those used for English because of the linguistic differences between the two languages. One of the most significant features that discriminate Japanese language from other languages is a very complex orthographic system; that is, a combination of syllabaries and logographies (Just & Carpenter, 1987; Taylor, 1987). Moreover, more than two thousand characters in total are used in printed materials, such as newspapers, magazines, books, and so on. This uniqueness of the Japanese orthographic system may affect the way that L2 readers use lower processing strategies (i.e., language decoding strategies). Therefore, empirical data of the reading process of JSL readers may contribute to a further understanding of second language reading processes.

Research Questions

The research questions that were addressed in this study were as follows:

- 1. What types of reading strategies are consciously employed by learners in an intermediate university Japanese language course?**

This question focuses on any difference in the types of strategies used by JSL readers to those that have been identified in ESL research.

- 2. Is there any difference in the pattern of strategy use for reading comprehension of Japanese between English native readers and Chinese native readers?**

This question specially focuses on how Chinese L1 readers apply their knowledge of Chinese characters to comprehending Japanese texts and if English L1 readers use any specific strategies to compensate for their lesser prior knowledge of Chinese characters.

- 3. Are there any characteristics of strategy use that discriminate the more effective readers from the less effective readers in each language group?**

This question focuses on whether there are any combinations of strategies that are characteristic of more effective or less effective readers in each language group.

Definitions of terms

The definitions of some terms used in this study are as follows:

Second language(s)(L2): This term is used in this study as a language or languages acquired after the first language(s). Therefore, the term 'second language(s)' includes both foreign languages, such as English in Japan, and second languages, such as English in Hong Kong.

Reading: Here, this refers to silent reading for understanding what is written in a text. This term does not include 'reading aloud' or skimming or scanning for collecting specific information.

Reading strategies: In this study, reading strategies are defined as strategic procedures that readers *consciously* or *subconsciously* employ in order to understand what is written in a passage (Barnett, 1989). Reading strategies include understanding at the discourse level as well as at the more local level, such as specific words, phrases, and sentences.

Chinese characters: The term 'Chinese characters' refers specifically to the logographic symbols used in the Chinese language. In this study, the term, 'Chinese characters' includes only traditional characters as used in Hong Kong and Taiwan, and does not refer to pinyin or simplified characters used in the mainland of China. Also, 'kanji' refers to the logographic symbols used in the Japanese language.

Knowledge of Chinese characters: Since the Japanese writing system was developed by adapting Chinese characters, Chinese characters (i.e., kanji) are extensively used in Japanese writings. However, in this study, this term refers to "a knowledge of Chinese characters" as used in the Chinese language.

The following chapter reviews literature related to the reading comprehension process and use of reading strategies in L2. It then presents an overview of the Japanese orthographic system and presumable effect of readers prior knowledge of Chinese characters on reading in Japanese. Finally, the chapter reviews the previous studies on kanji-word problem solving strategies and ongoing reading strategy use in JSL contexts.

Chapter three describes the design and data collection methodology of this study. First, it restates the research questions and describes the design of this study. Then, it describes the number and types of participants. Third, a detailed description of the data collection methodology is presented with a discussion concerning the limitations of the methodology. Fourth, the materials used in this study are described in detail. Finally, the pilot study and the procedures of actual data collection are described.

Chapter four presents the results of quantitative analyses of this study. First, the results of the Japanese Language Proficiency Test are presented, followed by overall strategies use and comparison of the strategy use between the English native readers and Chinese native readers. Then, the use of word-problem solving strategies in the two language groups is examined. Finally, the recall scores and their correlation with strategy use are analysed.

Chapter five presents a discussion of the results of quantitative analyses in relation to the three research questions. Furthermore, the results of the qualitative analyses are also presented and discussed.

Chapter six presents the conclusions and limitations of the results of this study. It also shows the pedagogical implications and suggests directions for further research.

CHAPTER 2

Review of Related Literature

In this chapter, first, the currently most prevalent model of reading comprehension, the interactive model, will be described to illustrate the basic process of reading comprehension. Then, the previous reading strategy research in non-JSL contexts will be reviewed. This chapter also describes the characteristics of Japanese text in terms of their possible impact on comprehension of JSL readers. Finally, the previous research regarding reading processes and reading strategies among JSL readers will be reviewed.

Interactive Model of Reading Comprehension

In recent years, most researchers, both in L1 and L2 reading research, have emphasised the active role of readers (among others, Alderson, 1984; Barnett, 1989; Carrell, Devine, & Eskey, 1988; Casanave, 1988; Davis, & Bistodeau, 1993; Horiba, 1990; Koda, 1994; Schats, & Baldwin, 1986; Stahl, Hare, Sinatra, & Gregory, 1991; Smith, 1988; Stanovich, 1991; Swaffar, Arenes, & Bynes, 1991). That is, reading comprehension requires readers to employ an active mental process, as if they were composing a new version of the text for a reader existing inside themselves, and to apply their previously acquired knowledge, which is called "background knowledge," in understanding the text (Pearson & Tierney, 1984, cited in Barnett, 1989). In other words, "comprehending a text is an interactive process between the reader's background knowledge and the text" (Carrell & Eisterhold, 1983, p. 556).

This view of reading comprehension is called an "interactive model" (Rumelhart, 1977), and has its theoretical roots in schema theory. According to the description of Carrell and Eisterhold (1983), within the model of schema theory, the role of a text is only to provide direction for readers to retrieve or construct meaning from their own background knowledge. The background knowledge is structured by sub-units of knowledge called schemata. Schemata are hierarchically organised. Most general schemata, such as knowledge of the world and the knowledge of the topic, are at the top of the hierarchy and most specific schemata, such as knowledge about the spelling patterns in the language, are at the bottom. All incoming information is processed through two basic modes: bottom-up processing and top-down processing. In bottom-up processing, the features of the text, such as letters, words, or phrases, are processed first to construct the meaning, and then received at the higher-level of processing that involves syntactic, semantic, and discourse knowledge of the language. On the other hand, in top-down processing, a reader makes general predictions about what comes next based on general schemata, and then searches the text for information that will at least partially satisfy these predictions.

Two types of schemata are broadly considered important. One is "formal (structure) schemata," which refers to the background knowledge of the formal and rhetorical organisational structure of different types of text. The other type "content schemata" is the background knowledge of the topic of the text and of the world. For successful comprehension, the reader must activate schemata appropriate to the text. Previous studies in second languages showed that reading comprehension and recall were enhanced

when a reader was familiar with the content and aware of the formal structure of the text (Barnitz, 1986; Carrell, 1984, 1987, 1992; Roller, & Motambo, 1992).

A reader simultaneously uses the two modes of processing, bottom-up and top-down, throughout the reading comprehension. However, Stanovich (1980) suggested that either type of processing may compensate for deficiency in the other. For example, readers may use their background knowledge to infer the meaning of unknown words (top-down processing), while they might use information obtained by word recognition to construct meaning when little background knowledge is available (bottom-up processing). Nevertheless, relying too heavily on one specific mode appears to adversely impact comprehension (Eskey, 1988; Grabe, 1988). If readers do not acquire efficient use of lower-processing skills (such as phonetic, letter, and word recognition), then their memory will be overloaded and enough memory capacity will not be available for higher-processing. LeBerge and Samuels (1974) argued that both decoding and comprehension require attention and that, since a human can only attend to one thing at a time, readers need to acquire automaticity in lower-level processing. On the other hand, if readers are not efficient in using higher-processing skills (such as use of contextual clues, activation of formal and content schemata), then they will fail to identify the relationship between sentences. Therefore, both bottom-up decoding and top-down interpretation are equally important for efficient reading comprehension.

Reading Strategy Research in Non-JSL Contexts

Observations of Ongoing Use of Reading Strategies by L2 Readers

Since the 1980's, the investigation of strategies has become one of the central components in second language reading research (Grabe, 1991). Reading is considered to be a type of problem-solving activity (Anderson, 1991; Barnett, 1989; Block, 1986, 1992; Sarig, 1987). Therefore, the reader's ability to use problem-solving strategies may have a influence on performance in comprehension.

Block (1986) investigated the reading strategies employed by ESL students who were native speakers of Chinese and native speakers of Spanish, and she compared the results with strategy use among native speakers of English. She used think-aloud protocols in order to observe the subjects' on-going processes during reading comprehension task (see Chapter 3 for further description of think-aloud protocols). This study produced two broad categories: general and local strategies. General strategies are used for global comprehension: to gather information for the comprehension using their background knowledge and to monitor their own comprehension. The comprehension gathering strategies in this category seem to reflect top-down processing. Local strategies, on the other hand, serve to understand specific linguistic units in the text. This category is involved in bottom-up processing.

She also identified two modes of response: an extensive mode and reflective mode. In the reflective mode, readers direct their attention away from the text and towards themselves. Their focus is on their own thoughts and feelings rather than on the

information in the text. In contrast, readers in the extensive mode focus on understanding the ideas of the author expressed in the text. They do not relate the text to themselves.

Block identified several findings from this study. First, in terms of general strategy use, there seemed not to be any particular pattern of strategy use either which distinguished the ESL readers from the native speakers of English or which distinguished the native speakers of Chinese from the native speakers of Spanish. Moreover, the strategy types and the pattern of strategy use of English native speakers did not appear to be different from those of the ESL readers. She suggested that the strategy use, particularly the use of higher-level ones, may not be tied to specific language features.

Second, there was no evidence indicating specific "effective strategies." All proficient readers used different strategies in different combinations although there were four characteristics of effective readers; they demonstrated (a) integration of the information in the text, (b) high awareness of text structure, (c) ability to relate general knowledge and personal experience to the information in the text, and (d) response in the extensive mode. However, these characteristics were observed to some extent in the less proficient readers, too. Rather, the most significant factor that distinguished the effective readers from less effective was the frequent use of monitoring strategies and the capability to plan using alternative reading strategies to solve their problems in comprehending the text. In other words, the effective readers in this study had well-developed metacognitive abilities. Therefore, Block concluded that readers' metacognitive ability, such as ability to monitor their understanding and to plan the strategies to solve problems, is the key differentiating effective readers from less effective readers.

Block's conclusions were supported by Sarig (1987). Sarig studied the strategy use for main idea analysis and overall message synthesis tasks by ESL students in their first and second languages. Prior to the experiment, Sarig set up four categories of moves (i.e., strategies): technical-aid moves, clarification and simplification moves, coherence-detecting moves, and monitoring moves.

Technical-aid moves are strategies involving specific techniques to facilitate text processing, such as skimming, scanning, skipping, marking and writing key elements. Clarification and simplification moves refer to strategies used to clarify and/or simplify what is written in the text. These moves include the use of various types of substitution, simplification, paraphrases, synonyms, and circumlocution. The third type of moves, coherence-detecting moves, is involved with strategies, such as effective use of prior content and formal schemata to predict forthcoming text, identification of key information in the text, identification of people in the text and views or actions attributed to them, cumulative decoding of text meaning. The last type in Sarig's list of strategies is monitoring moves, which are defined in much the same way as comprehension monitoring strategies in Block's study.

The results of the study indicated that all participants used a similar number of moves regardless of the consequent task scores. Sarig also found that the monitoring moves contributed to the success of comprehension only when a reader can: (a) be aware of the nature of the task; (b) be aware of the need to control consistency of task performance; (c) identify failure in comprehension; (d) recruit various resources for the error correction; (e) evaluate correctly one's chances of handling a difficulty; (f) control

decoding effort, and (g) tolerate uncertainties in comprehension when necessary. Sarig, therefore, concluded that how the readers use the strategies, that is the reader's metacognitive ability, is more crucial for success in reading comprehension than what strategies they use.

Metacognition, Reading Comprehension, and Strategy use

Previous reading research in reading strategies showed that a reader's metacognitive ability, rather than the use of specific types of strategies, may be critical for successful comprehension. Metacognition refers to "the knowledge about our own thinking and learning" (Casanave, 1988). Metacognition in reading includes "(a) readers' knowledge of their cognitive resources and their compatibility with the reading situation, (b) self-regulatory mechanisms used by an active learner during an attempt to solve a problem, and (c) development and use of compensatory strategies for either reading for meaning or reading for remembering" (Connor, 1987, p.17). The readers who developed metacognitive capability, for example, know what reading strategies they have already acquired and which strategies are effective for accomplishment for a specific type of reading task. While reading a text, they frequently check the accuracy of their understanding and sometimes adjust the reading speed in order to prevent overload of their mental capacity. They also know what they should do when they cannot understand what they are reading. The metacognitive ability is critical even for students in the beginning level of L2 learning since this ability is also needed for efficient decoding and

encoding even if those learners rely more on the language decoding or bottom-up strategies rather than top-down strategies (Swaffar, Arens, & Bynes, 1991).

Barnett (1988) investigated the relationship among the reader's metacognitive awareness, strategy use and reading comprehension among university students of French as a foreign language. In her study, the subjects' metacognitive awareness was measured in terms of the subjects' perception of using more effective strategies in the reading tasks. As for strategy use, she focused on one specific strategy: reading using context as a clue. She found an interaction among three factors; students who read using context better were more likely to perceive that they used effective strategies, and they also comprehended better.

In the 1992 article, Block reported on her examination of the use of a comprehension-monitoring strategy, which is considered one of the self-regulatory strategies, by the subjects in her study (1986). She identified three phases, and their associated six steps, of the process of comprehension-monitoring: the evaluation phase (problem recognition and problem source identification), the action phase (strategic plan and action/solution attempt), and the checking phase (check and revision). She found that less proficient readers, both the native and non-native speakers, used the comprehension-monitoring process incompletely; they could identify problems, but seemed not to know what to do next. In contrast, the proficient readers not only were able to recognise problems, but also were able to identify ways to solve the problems. Also, the effective readers were evaluating whether those problem-solving strategies actually work or not.

The results of this investigation, therefore, support her previous conclusion that the more proficient readers may have a well-developed use of metacognitive strategies.

Other Factors Related to Reading Strategies

L2 Proficiency and Reading Strategy Use. There has been a debate regarding the relationship between L2 proficiency and reading strategy use among L2 learners. Some researchers have argued that reading in L2 critically depends on one's L1 reading ability rather than upon the learner's proficiency level in the target language (Coady, 1979; Jolly, 1978, cited in Alderson, 1984). They argued that the higher-level processing strategies in L1 may be transferred into L2 and may compensate for weakness in lower-level linguistic skills (Coady, 1979). However, there are also claims that the reading ability in L2 depends on the reader's proficiency in the language (Carrell, 1991; Clarke, 1980; Cziko, 1980; Devine, 1987).

Clarke (1980) summarised the results of two studies that examined the transfer of strategies using semantic and syntactic cues from L1 to L2 among beginner level of Spanish speaking ESL learners. One study used the cloze test and the other used miscue analysis procedures. Clarke found that the good L1 readers, who achieved high scores in the Spanish cloze test, focused on the semantic cues more frequently than the poor L1 readers in reading L1. He also found that the good L1 readers performed better than the poor L1 readers in both languages. However, the differences between the two groups of readers were greatly reduced when they read in L2. Clarke suggested that there may be a

threshold level of proficiency that must be attained before good readers can transfer obtained reading strategies in their L1 to reading in L2.

Other researchers found similar results that suggest the "short-circuit" in L2 reading; that is, limited control over L2 causes the good readers to use poor reader strategies (Clarke, 1980). Cziko (1978, 1980) investigated the relationship between language competence and the use of graphic (e.g., visual similarity of words) and contextual information (e.g., semantic, syntactic, and discourse clues) in reading comprehension among the intermediate and advanced French L2 learners in the Grade 7. He also used native speakers of French as a control group. To collect the data, he used miscue analysis as Clarke did. In this study, he found that the intermediate group made graphically induced errors most frequently, and as the learner's proficiency level increased, occurrence of this type of error decreased. Furthermore, the intermediate group made errors conforming to syntactic and semantic clues, which were provided by the preceding parts, less frequently than the advanced and native speaker groups. Although he acknowledged that the interpretation of the results of this study must be limited to the oral reading by native French and English speaking students, Cziko concluded that there is a possible proficiency level which L2 learners must attain in order to be able to use higher-level reading strategies as the native speakers do.

Nevertheless, one may argue that the findings by Clarke and Cziko cannot be generalised since both researchers used the miscue analysis in oral reading and since reading processes in oral reading may not be the same as those in silent reading. In her study, Carrell (1991) investigated this short-circuit in silent reading. She pointed out the

methodological shortcomings in Clarke's study; since the subjects in his studies were all at approximately the same level of English proficiency, it is difficult to say precisely what role proficiency in L2 plays in the short-circuit of strategy transfer. Therefore, she used Spanish native speakers in an intermediate and advanced ESL program and native speakers of English in beginning and intermediate university Spanish courses in her study. She examined the effect of two variables, L1 reading ability and L2 proficiency, on L2 reading. The results were rather inconclusive. For the Spanish L1 group, she found that L1 reading ability was a stronger predictor of L2 reading. In contrast, for the English L1 group, the L2 proficiency was a stronger predictor than the L1 reading ability. Carrell suggested that this difference in the relative importance of the two factors in each group may be due to the difference in the absolute proficiency between the L1 groups; the Spanish L1 group had higher proficiency in L2 than the English L1 group in their L2. Consequently, she concluded that one of the most plausible explanations for this result was that the proficiency level in L2 may be more critical for learners at slightly lower proficiency levels than those who have attained slightly higher proficiency. This implicitly supports the existence of a language threshold in transfer of L1 strategies into L2 reading.

Linguistic Characteristics of the L2 and Reading Strategies. As discussed in the previous section, reading in L2 involves both L1 reading ability and L2 proficiency. Also, reading requires both general cognitive skills (e.g., reasoning and inference) and language processing skills (e.g., letter and word processing, use of syntactic and semantic cues)

(Koda, 1994). Thus, one could assume that linguistic properties that are unique to specific languages may call for particular processing skills and strategies.

In L1 research, for example, eye-movement studies showed that experienced English L1 readers seemed to attend to content words more than function words when reading English (Carpenter & Just, 1983), while experienced German L1 readers attended to function words more than content words (Bernhardt, 1986, cited in Swaffer, 1988). Swaffer (1988) pointed out that this contrast between English and German L1 readers might indicate the differences in the effect of function words on comprehension in each language, and she suggested that the linguistic differences between the two languages might induce the different optimal processing strategies.

Koda (1988) conducted two studies that investigated word recognition strategies among skilled native readers of English, and ESL readers from three different orthographic backgrounds: Arabic, Spanish, and Japanese. According to Koda, there are two types of orthographic system that are distinguished by the ways that words are recognised. The first one is phonographic orthographies, such as those in Spanish and Arabic, in which grapheme and phoneme are corresponding to each other. Word recognition in this type of orthographic system involves linear-mode processing; that is, the phonological decoding always occurs prior to semantic decoding. The second type of orthographic system is logography, such as Chinese characters and kanji in Japanese, in which one graphemic unit corresponds to the meaning of an entire word or morpheme and also corresponds to a sound sequence. In this type of orthographic system, word recognition processing is in parallel-mode; that is phonological decoding occurs

spontaneously with, or after semantic decoding. English lies between the two orthographic extremes above. Koda categorised English and Japanese groups as parallel-mode readers and Spanish and Arabic groups as linear-mode groups. In order to examine the effect of each type of word recognition processes, Koda tested the effects of blocking either visual (e.g., *rane* and *tane*) or sound (e.g., *rain* and *rane*) information on a lexical decision making task in the first study and the effects of heterographic homophones (e.g., *eight* and *ate*) on a text comprehension task in the second study. The results of both studies were consistent; the parallel-mode groups relied more heavily upon the visual information than the linear-mode groups did. Therefore, Koda concluded that the transfer of the lower-processing strategies, such as word recognition, may occur in L2 reading. This conclusion suggested that to transfer L1 lower-processing strategies into L2 may either assist or impede reading comprehension, depending on the difference or similarity of the optimal processing strategies between L1 and L2.

Strategies for Inferring Unknown Vocabulary in Text Comprehension. It appears that there is an agreement among researchers with respect to the strong relationship between vocabulary knowledge and comprehension in L2 reading research (e.g., Davis & Bistodeau 1993; Grabe, 1991; Koda, 1994; Ulijn, 1981; Swaffar, Arens, & Bynes, 1991). Ulijn (1981) found that the knowledge of the content words was especially crucial for reading comprehension since the important ideas of the text are expressed by those content words. If readers recognise that they do not understand the meaning of a word,

they will try to guess the meaning by using cognates, context clues, and some other means.

Haynes (1984) identified some of the inference strategies for unfamiliar words among ESL readers from different L1 backgrounds. She found that, regardless of the readers' L1 backgrounds, they profited more from the immediate context, such as from the words in the same sentence, than from the global context. In addition, the readers frequently used morphological analysis and graphemic and phonemic matching as well. Haynes, however, found that the guesses drawn from these morphological and graphophonemic matches often conflicted with the syntactic context. In other words, as Haynes stated, the saliency of word shape overrode the reader's ability to attend to the context clues, such as syntactic ones. From this observation, Haynes suggested that the more familiar a word looked, the more difficult it was for L2 readers to shift attention away from graphophonemic form.

Huckin and Bloch (1993) investigated the processes for inferring the meaning of unknown words used by three ESL students at the intermediate level. In analysing their subjects' think-aloud protocols during the translation task, they identified some steps used to infer the word meaning. In this model, readers first study the word form to see if they recognise any of its parts. If they do, then they generate a hypothesis as to what the word may mean. Finally, they use one or more context-based strategies to evaluate this hypothesis. If they do not recognise any part of the word at all, then they would use context-based strategies to generate a guess. The most common context-based strategies used by Huckin and Bloch's subjects were use of some clue-words which are located

immediately before or after the unknown word. If the readers could not find any clue words or other contextual aids, and if they could generate a coherent text representation without using the unknown word, they avoided the word entirely.

Huckin and Bloch also found that their subjects used the context both to generate and evaluate their inferences. However, generation of the inferences was also done through morphological or other word-level analysis. In such cases, the context served only for evaluation of the inferences.

One of questions in their study was what causes the readers' failure to take full advantage of context clues. The results of this study showed that the failure to use context clues to infer the word-meaning occurred when the subjects thought that they knew the word, but actually did not. The subjects mistakenly identified the word and failed to examine the context. In most cases, this failure was due to the subject's misidentification of word form. Huckin and Bloch argued that misidentification of word form might be a serious problem if the vocabulary in the students' L1 contains a large number of cognates of the target language (e.g., vocabulary in English and that in French). This finding strongly supports the suggestion from Haynes (1984) that word familiarity may cause L2 readers to ignore contextual incongruity. Huckin and Bloch, therefore, suggested that sensitising L2 learners to the potential sources of graphemic confusion may be valuable to help L2 learners realise the importance of using the context clues to confirm their inferences, and at the same time teachers should help the learners develop metacognitive skills, such as monitoring their inferences using the context clues.

Summary

In summary, the previous research on reading strategies within non-JSL contexts found that: (a) the readers' metacognitive ability is more crucial for success in comprehending the text than what strategies they use; (b) there may be a threshold level of language proficiency that the readers must have attained in order to transfer their effective strategies from L1 to L2; (c) the linguistic characteristics of L2 (e.g., orthographic system) may require L2 readers to acquire a new set of lower-processing strategies (e.g., word recognition) that is different from those of their L1; (d) L2 readers used the immediate context in order to both generate a guess of the unknown words' meanings and evaluate the rightness of the guess; and (e) the word familiarity may cause L2 readers to overlook contextual factors.

Reading Comprehension Research in JSL

Characteristics of Japanese Language and Reading Comprehension

The most notable characteristic of the Japanese language is its use of multiple types of orthography and its vast number of characters (Satake, 1989; see also, Just & Carpenter, 1987; Taylor, 1987).

In Japanese, there are three basic orthographic symbols: hiragana, katakana, and kanji. Kanji is categorised as logography, in which each character represents the meaning of a whole word or morpheme. In contrast, hiragana and katakana are syllabaries, and each character represents a syllable. Figure 1 provides an example with the same word, meaning "cat," shown in the three orthographic symbols.

Figure 1. Examples of Japanese orthographic symbols.

/ne-ko/

hiragana: ねこ

katakana: ネコ

kanji: 猫

The Japanese word corresponding to "cat" consists of two syllables, /ne/ and /ko/. In kanji, these syllables are represented by one character. However, in hiragana and katakana, one syllable is assigned each character: "ね" (/ne/) and "こ" (/ko/) in hiragana, and "ネ" (/ne/) and "コ" (/ko/) in katakana.

Although these three orthographic symbols may be used together in one sentence, each of them has a specific function in the sentence (Satake, 1989). Kanji is mainly used for content words and stems of words such as verbs and adjectives. On the other hand, hiragana is primarily used for function words, such as post-positional case-marking particles, for inflections of verbs and adjectives, or for auxiliary verbs. Katakana is usually used to write words of foreign origins, especially those from Western languages, and onomatopoeic words. Figure 2 illustrates an example of actual use of these three orthographic symbols in a Japanese sentence. The characters with single underlines are hiragana, those with double underlines are katakana, and those without any underline are kanji.

Figure 2. Examples of three orthographic symbols in a Japanese sentence.

私はシンガポールで四年間日本語を教えた。

私 は シンガポール で 四年間 日本語 を 教えた。
I as for Singapore in for four years Japanese [OM]¹ taught

"As for me, I taught Japanese in Singapore for four years."

Hiragana and katakana have nearly 50 characters each, whereas kanji has from 3000 to 4000 kanji used in Japanese daily life (Satake, 1989). However, the Japanese government has set a guideline to limit the number of kanji that are commonly used in publications, such as governmental documents, newspapers, magazines, and in broadcasting, to 1,945 characters (Kindaichi, Hayashi, & Shibata, 1988). Taylor (1981, cited in Koda, 1988) estimated that, in an average sentence, about 65 percent of the characters consist of hiragana, 25-30 percent of kanji and four percent of katakana.

The use of multiple orthographic symbols, however, becomes a potential obstacle for foreign learners reading Japanese (Takebe, 1989). Kanji, in particular, are critical for learners whose L1 does not have Chinese characters in its orthographic system, such as English. The graphic complexity of kanji requires native speakers of English to acquire a new set of lower processing strategies, which are quite different from the strategies in their L1, for processing the information at a higher level. In addition, they have to develop lower-processing strategies for a vast number of kanji. In general, JSL learners are expected to be able to recognise (and understand the meaning of) at least 300 kanji by

¹ OM indicates a 'direct object marker'. It does not have any English word that it corresponds to because direct objects are marked by word order in English.

the end of a beginner level course (Yoshimura, 1989). Since many of kanji words are composed of two kanji, the actual number of words that they have to be able to recognise can be much larger than 300. Immaturity of using lower-processing strategies and the overwhelming number of kanji may reduce working memory capacity for higher-level processing for kanji among English-speaking JSL readers.

On the other hand, it is generally considered that those who are literate in Chinese have an advantage in reading Japanese. Historically, the Japanese orthographic system has evolved through the continuous adaptation of classical Chinese characters and the partial simplification of the Chinese characters (Just & Carpenter, 1987; Takebe, 1981). Consequently, most kanji are quite similar to Chinese characters in terms of their physical features and the meanings that each character has. Furthermore, as a result of the long-term cultural and scholastic exchange between China and Japan, the Chinese and Japanese languages have adopted a large amount of vocabulary from each other (Miura, 1983; Shen, 1993). Therefore, there are many cases in which the learners of Japanese can use their vocabulary knowledge in Chinese to understand the meaning of unknown kanji words (Chou, 1991; Takebe, 1979). They may not know the readings (i.e., pronunciations) of those kanji words, but it does not seem to be a problem to comprehend the meanings because semantic decoding of kanji words may be done without phonological decoding (Koda, 1988). Figure 3 shows the example of the similarity between Japanese and Chinese in written form.

Figure 3. Comparison of Japanese and Chinese sentences.

Japanese: 私はシンガポールで四年間日本語を教えた。
 I Singapore in 4 years Japanese taught

Chinese: 我在新加坡四年教了日本語。
 I in Singapore 4 years taught Japanese

Meaning: I taught Japanese in Singapore for four years.

In this example, most of the kanji in the latter part of the sentences ("taught Japanese for four years"), 四年間日本語を教えた in Japanese and 四年教了日本語 in Chinese, are the same in both languages (i.e., 四年 "four years," 日本語 "Japanese," and 教 "teach"). This similarity between Chinese characters and kanji can enable Chinese-literate learners to transfer well-developed word recognition strategies and vocabulary knowledge in Chinese into understanding kanji words, and this transfer may enable those learners to spare more memory for higher-level processing. The same knowledge would also presumably facilitate the acquisition of Chinese by Japanese speakers or by English speakers who are literate in Japanese.

Koda (1989) investigated the development of reading proficiency among beginner-level JSL learners in terms of differences in knowledge of Chinese characters. There were two groups of students: a kanji group, which consisted of Korean² and Chinese students, and a non-kanji group, which consisted of all other students. She tested the reading proficiency, grammar knowledge, and vocabulary knowledge among the students in the

² Korean language has both logographies (i.e., Chinese characters) and alphabetic characters (i.e., Hangu) in its orthographic system (Taylor, 1987). However, it appears that use of Hangu dominates now.

two groups once at the end of each of the first two quarters, and examined the difference between the two groups. The results showed that vocabulary knowledge was the single most significant factor discriminating the kanji group from non-kanji group. Koda also found not only that the kanji group performed better than the non-kanji group on all the tests, but also that the difference between the two groups did not change over time in the simple tasks (e.g., word translation, word-grouping, changing the word forms, and inserting particles) and became greater in the more complex tasks (e.g., sentence completion and reading comprehension). These results imply that whether the learners are literate in Chinese may have a significant influence on Japanese reading comprehension and the development of the ability to comprehend Japanese texts.

Nevertheless, kanji could also be an obstacle for Chinese-literate JSL learners. Some researchers in JSL have pointed out that there are some discrepancies in the meanings of characters and their combinations in Japanese and Chinese (Chou, 1991; Takebe, 1979, 1989). In other words, one combination of kanji may have a different meaning in Japanese and Chinese. For example, a combination of kanji signifying "letters (for corresponding)" in Japanese (手紙) means "toilet paper" in Chinese, whereas the word referring to "letters" in Chinese is 信. The Cultural Agency of Japan (1978, cited in Takebe, 1979) studied 1,882 kanji compounds appearing in three kinds of beginning and intermediate JSL textbooks, comparing the meanings with corresponding Chinese words that are currently used in Chinese society. The results showed that 27 percent of those words did not exist in Chinese. Also, eight percent of them have slightly or completely different meanings in Chinese. This implies that a knowledge of Chinese might lead learners to an incorrect

judgement of the meaning of the unknown Japanese words if those learners relied only on their knowledge of Chinese.

Moreover, Koda (1989, 1990, 1993) suggested that knowledge of case-marking particles is also important for comprehending Japanese texts. Previous reading research in non-JSL context revealed that both syntactic and semantic knowledge is necessary for successful comprehension (see Swaffer, 1988; Swaffer, Arens, & Bynes, 1991).

According to Koda (1989, 1990, 1993), Japanese makes use of both case-marking particles and word order for case marking. However, she assumed that case-marking particles would be more important than word order because of the relative flexibility of word order between the subject and main verb in a sentence and the frequent occurrence of ellipsis of subjects and objects. In 1990 studies, Koda investigated the relationship between various factors in Japanese reading comprehension and found that both vocabulary knowledge and case-marking particle knowledge strongly correlated with comprehension scores. This finding suggests that relying on vocabulary knowledge alone may not facilitate the successful comprehension in Japanese language.

There is also some evidence that being literate in Chinese may not be an absolute advantage for comprehending Japanese texts. Results of Isida's study (1985), for instance, suggested the knowledge of Chinese characters is not necessarily the greatest predictor of the overall performance in reading comprehension of Japanese texts. She studied intermediate learners whose L1 was English, Chinese (Mandarin and Cantonese), and Korean, regarding the difference in achievement of various Japanese language skills. The results of the study showed that the Chinese group gained the highest scores in kanji and

vocabulary tests, the Korean group scored second, and the English group was the lowest among the three language groups. Interestingly, however, the results of the reading comprehension test did not differ as much as those of the kanji and vocabulary tests, although the mean score of the Chinese group was significantly higher than that of the English group.

Hatasa's study (1992) reports similar results. She investigated the effect of transferring knowledge of Chinese characters on kanji recognition, grammar, and reading comprehension tasks in Japanese. Her study used three groups of JSL readers who were differentiated by their overall proficiency level in Japanese: beginner, intermediate, and advanced. The readers at each proficiency level contained both native speakers of Chinese (Mandarin and Cantonese) and native speakers of English. She found that the Chinese groups at all proficiency levels transferred their knowledge of Chinese characters to a fairly large extent in the reading task. However, their proficiency levels had a greater effect on the score in the reading comprehension task than the knowledge of Chinese characters. Consequently, Hatasa concluded that the knowledge of Chinese characters is not a significant factor in reading performance, and suggested that other variables, such as discourse structure, cohesion, or grammar, may have to be emphasised more in teaching reading.

In summary, previous research into the characteristics of Japanese language and reading comprehension suggested: (a) kanji can be one of the most critical obstacles for JSL learners whose L1 does not have similar logographies, when learning to read and write Japanese; (b) however, if the learner is literate in Chinese, he/she may be able to

transfer the vocabulary knowledge from Chinese to facilitate the comprehension of Japanese texts, although excessive reliance on the knowledge of Chinese characters and vocabulary alone may inhibit the successful comprehension of Japanese; and (c) in comprehending Japanese texts, the influence of knowledge of Chinese characters may not be as significant as most JSL teachers believe, particularly, among the learners at higher proficiency levels.

Kanji Vocabulary Solving Strategies for JSL Readers from Non-Chinese Character

Background

In the previous section, it was pointed out that kanji may be the largest obstacle for JSL learners who do not use Chinese characters in their first language. Then, what will those whose L1 do not have Chinese characters do when they meet the unknown kanji words? Some JSL researchers tried to identify the strategies used by those readers when they have to guess the meaning of unknown kanji words to understand Japanese texts.

Taniguchi (1991) investigated how JSL readers use problem solving strategies in order to overcome the obstacles that they faced in comprehending Japanese science texts (see the following section for a summary of this study). All the subjects in this study had no previous knowledge of Chinese or Korean. In this investigation, she found four types of vocabulary-solving strategies for unknown kanji words. Those strategies are presented in Figure 4.

Figure 4 Word problem solving strategies for unknown kanji words (Taniguchi, 1991).

1. Decomposition of kanji

e.g. Guessing a meaning of the character 液 ("fluid") as something related to 'water' or 'fluid' because the character contains 水 ("water"; simplified as 氵) as its part.

2. Recognition of the kanji in the compound

e.g. Guess the meaning of 物質 ("substance") as 'the condition' because 物 means "object" and 質 means "quality".

3. Knowledge of the general construction of kanji compounds

e.g. Guess the meaning of 原子 ("atom") as a person's name because Japanese first names for girls tend to end with the character 子.

4. Background knowledge of the content

e.g. Guess the meaning of 分子 ("molecule") as 'molecule' because 原子 means 'atom'.

Taniguchi's data suggest that the background knowledge and contextual clues helped her subjects infer the meaning of unknown vocabulary successfully. For instance, the reader whose example was shown in item 4 knew that 原子 means "atom". Also, he obviously had basic knowledge in physics since he knew the word 'molecule'. On the other hand, purely depending on the information obtained from the kanji in the target word may lead the readers to a wrong inference. For example, the reader who guessed that 原子 was a person's name over-generalised the structural rule of the Japanese compound and ignored the fact that the text was talking about something related to physics. Consequently, the reader did not recognise that he made a wrong guess until another student told him the compound meant "atom." This implies that not only focusing

on the information obtained from the kanji character (i.e., bottom-up processing) but also taking into account the broader context (i.e., top-down processing) is required for successful inferencing in relation to the unknown words.

Lee (1993) found similar strategies to those in Taniguchi's study in her observation of how advanced JSL readers guess unknown words, including both kanji and unknown kanji words, in Japanese newspapers. Among her examples, all but one were unknown kanji words. Lee found three additional strategies used by her subjects. These are presented in Figure 5.

Figure 5. Additional problem solving strategies for unknown kanji words (Lee, 1993).

1. The use of contextual clues
2. The use of *okurigana* (i.e., normally the inflected part of a verb and an adjective that is to be written in hiragana) to search for the word that fits to the context
3. The use of the reading of one of the two kanji that make up a compound
4. Guess the reading of the compound 挑戦 ("challenge") as [choo-sen] because the reading of 戦 is [sen] and [choo-sen] is the only word to fit to the context.

Lee also found that there were some differences between the good readers and poor readers in their use of those strategies. Her good readers combined more than one strategy; they in particular used the combination of the contextual clues and the meaning of a kanji in a compound. Also, the good readers paid more attention to the meaning of both kanji in a compound, while the poor readers tended to remember a compound as a chunk without looking at the meaning of individual kanji. For example, one of her

subjects guessed the meaning of 端的 ("direct") as "extreme" because she had seen the kanji 端 in a different compound 極端 ("extreme"), whereas the meaning of "extreme" actually comes from the character 極. In another instance, a reader read aloud the compound 史上初 [*shi-joo-hatsu*] ("the first time in history") as [*reki-joo-hatsu*]. She analysed this case as follows: the reader memorised a word 歷史 [*reki-shi*] ("history") as a chunk and in encountering one of the two kanji composing the word in a different combination (i.e., *shi* in [*shi-joo*]), he/she automatically adopted the reading of the first kanji from memory (i.e., *reki* in [*reki-shi*]). In contrast, good readers looked at the meaning of individual kanji and successfully reconstructed the meaning of a kanji compound. Furthermore, Lee found that poor readers occasionally misidentified a kanji as one that looked very similar to it. Lee suggested that JSL teachers should help students learn the meaning as well as an accurate form of individual kanji, and possible combinations with other kanji.

Observation of Ongoing Reading Strategy Use in JSL Contexts

Compared to the amount of work in non-JSL contexts, such as ESL and other European languages as L2, there has been little research aimed at observing JSL readers' ongoing reading process and strategy use during the comprehension of Japanese texts.

Horiba (1990) investigated the narrative comprehension process among L1 and L2 readers of Japanese, using think-aloud protocols. Her focus in this study was on the relationship between language competence and readers' attention to different aspects of reading comprehension and their strategy use. Her L2 subjects were all native speakers of

English, enrolled in a third-year Japanese language course at an American university. She categorised the strategies identified in think-aloud protocols into eight groups: predictions, questions on the content, comments on structure, comments on own behaviour, confirmation of predictions, references to antecedent information, inferences, and use of general knowledge and associations. The data showed that the L2 readers more frequently made comments on their own behaviours than did the L1 readers, and that these comments were predominantly about their self-monitoring of vocabulary and sentence comprehension. On the other hand, the L1 readers more frequently made inferences and elaborations, and relied upon their general knowledge and associations than the L2 readers did, although there was some evidence that the L2 readers also utilised a familiar schema on the topic of the story and activated relevant information. With these findings, Horiba suggested that limited automaticity in lower-level processing had L2 readers pay more attention to the vocabulary and grammar, and as a result, little capacity in short-term memory was available for higher-level processing. This corresponds with the previous research findings in non-JSL contexts (e.g., Clarke, 1980; Cziko, 1980; Carrell, 1991).

Another study (Taniguchi, 1991) that used the think-aloud procedures in a JSL context was more informal in nature than Horiba's study in terms of the research design and purpose of the study. However, it may be valuable to review the findings since the reading material used in Taniguchi's study was written in expository prose. Taniguchi (1991) attempted to observe reading processes of JSL readers and, at the same time, to integrate reading instruction and strategy training. Her subjects were six science graduate students in an intermediate Japanese course. There were no Chinese or Korean students

among the subjects. Reading strategies taught to the subjects were (a) to get a gist of the passage, inferring the meaning of unknown parts based on their previous knowledge, such as linguistic knowledge, formal knowledge, and content knowledge; (b) to read the passage, predicting the upcoming content, to check the accuracy of their prediction of the content and, if it's necessary, to correct the prediction, and (c) to separate important information from less important. The data were collected through a modified form of think-aloud procedures; each subject described their thoughts while reading the passage with peers. From the observation, Taniguchi distinguished five categories of strategies: predictions from the topic or illustration, inferring the meaning of unknown vocabulary, selection of the information, comprehension monitoring, and use of general knowledge and associations. Also, she found several sub-categories of strategies for solving word or kanji related problems. The passage used in this study was fairly short but contained a high percentage of unknown kanji and vocabulary. However, the subjects used various strategies for solving word or kanji related problems, such as inferring the meaning of a kanji compound from the kanji that they already knew, but at the same time utilising the content knowledge in order to understand the unknown parts of the passage. Unlike Horiba's study, Taniguchi observed little strategy-use focusing on syntactic features of the text. Taniguchi did not imply what caused this result. One of the possible explanations is that the emphasis on using content knowledge and a grasp of the important information in the passage might direct the subjects to the conceptualisation of what is written in the passage rather than detailed analyses of the sentence structures used in the passage. Because think-aloud protocols in this study were collected through group activities in an

actual reading class, the reading processes and reader's strategy use observed in this study may be different not only from those in a laboratory setting but also from those in a more natural context. Nevertheless, the observed reading processes of Taniguchi's subjects showed similarity to the findings in Horiba's study: L2 readers do utilise their content knowledge in order to understand the passage although they tend to focus more on aspects of the language itself, such as vocabulary.

Summary

In this section, the reading comprehension research in JSL contexts was reviewed. The characteristics of the Japanese writing system reviewed were: (a) use of multiple orthographic symbols and extensive use of kanji for content words; and (b) high semantic compatibility with Chinese words. These characteristics, particularly, use of a large number of kanji in authentic written Japanese possibly allows JSL readers who are literate in Chinese language to transfer their knowledge of Chinese characters and vocabulary into comprehending Japanese texts.

In contrast, kanji becomes a potential obstacle for learners whose L1 does not have Chinese characters since these learners must acquire a new set of lower-processing strategies, such as letter recognition strategies, for a vast number of kanji. Consequently, those learners use various types of word-problem solving strategies to compensate for the limited size of their kanji knowledge.

In addition, kanji can also be an obstacle for Chinese-literate JSL learners. There are some discrepancies between kanji compounds and their meanings in Japanese and what

those compounds mean in Chinese. These discrepancies may lead Chinese-literate JSL readers to a wrong inference of an unknown kanji compound and, in some cases, they may activate the wrong background knowledge of those readers.

Observation of the ongoing reading strategy use in JSL reported similar findings to those in non-JSL contexts: L2 readers do utilise their content knowledge in order to understand the passage (i.e., top-down processing) although they tended to focus more on language itself (i.e., bottom-up processing).

CHAPTER 3

Methodology

This chapter will present a description of the research design, participants, procedure for data collection, and analysis of the data.

Research Questions

The research questions that were addressed in this study were as follows:

1. What types of reading strategies are consciously employed by learners in an intermediate university Japanese language course?
2. Is there any difference in the pattern of strategy use for reading comprehension of Japanese between English native readers and Chinese native readers?
3. Are there any characteristics of strategy use that discriminate the more effective readers from the less effective readers in each language group?

Research Design

The present study aimed at investigating strategy use among intermediate learners of JSL involved in reading comprehension tasks. More specifically, this study focuses on identifying the types of strategies that are employed by the JSL readers and on investigating the relationship between the readers' L1 (i.e., English versus Chinese) and the way the readers approach Japanese text.

In order to achieve this objective, this study adopted a qualitative case study design. A case study design has a major strength in its suitability to small-scale investigation. (Nunan, 1992). In the area of second language research, case studies have generated very

detailed accounts of the processes of language learning (Duff, 1990, quoted in Nunan, 1992; cf. Johnson, 1992).

The goal of this study is an in-depth understanding of one phenomenon within the JSL context; that is, what is the process that JSL learners go through in reading Japanese texts for comprehension. Therefore, it is necessary for the researcher to observe the subjects' ongoing process during a reading comprehension task as closely as possible. One of the ways to achieve this is to use the readers' verbal reports during the task accomplishment and to trace their thought processes from those reports. Moreover, previous research on reading strategies has revealed the involvement of various factors, such as readers' backgrounds, and their use of strategies (see, Oxford & Crookall, 1989, for a summary of this issue.) Hence, the researcher needs to take into account such variables in analysing the obtained data. However, to conduct and manage this type of investigation, the researcher needs to keep the number of participants relatively small. Therefore, a case study design is the most appropriate for the purpose of this study.

Participants

The participants in this study were students enrolled in a second-year Japanese language course at a university in the Lower Mainland of British Columbia. Participants were recruited from one of two sections in February 1994. In that university, the two sections were taught by different instructors. Therefore, all participants were selected from the same section in order to eliminate the variability in the types of the instruction that they had received. In the recruitment, the researcher visited the class with permission from the instructor and described the study in English. Copies of recruitment letters in

English were also handed out to students. The researcher visited the classroom again in the next lesson and collected the names and telephone numbers of the students who were interested in participating in this study. Thirteen students (six English speakers and seven Chinese speakers) volunteered.

The researcher visited the class the following week and distributed the background questionnaires (Appendix A) and consent forms (Appendix B) to the volunteers. The questionnaire contained questions about personal background variables, such as age, gender, first and second languages, instructional language in their formal education, length of learning Japanese language, reading habits in their first and Japanese languages, and so forth. Also, the volunteers were asked to write down all of their free time during the next four weeks, so that the researcher could create the schedule for the activities in the project.

However, two English speaking and three Chinese speaking volunteers were dropped from the final analyses of the result of this study, although they were included and participated in all the activities for this study, because their background was extremely different from the rest of the participants. For example, two of the Chinese speaking participants had in fact grown up either in the United States or Canada and had never received formal education through the medium of Chinese. The other Chinese-speaking subject was much older than other participants. Also, two English participants had lived in Japan more than two years and therefore were not typical English speakers. Therefore, the data collected from eight participants were used in the final analysis in this study: four native speakers of English and four native speakers of Chinese. The backgrounds of these participants are presented in Table 1.

Table 1

Background of Participants

Participants (Pseudonyms by L1)	L1	Gender	Age	Residency in Canada ^a (Years)	Learning Japanese (Years)	Stay in Japan (Purpose of the stay)
Elaine	English	F	20	N/A	3.5	3 weeks (Cultural exchange)
Eleanor	English	F	22	N/A	2.5	None
Ed	English	M	20	N/A	1.5	2 months (Intensive Japanese course)
Eric	English	M	20	N/A	2	None
Colleen	Cantonese	F	19	6	4	None
Carmen	Cantonese	F	22	3.5	1.5	2.5 weeks (Vacation)
Cathy	Cantonese	F	21	0.6 ^b	2	None
Christy	Mandarin	F	20	4	2.5 ^c	2 months (Homestay)

^aThe information was collected through the interview. ^bAlthough her residency in Canada was less than one year, Cathy had studied English in Hong Kong from primary school, and she told the researcher that she had no difficulty in expressing herself in English. ^cThe number of years stated here is that of formal instruction. However, Christy explained that she had also learned Japanese informally from her Japanese relatives from approximately the age of ten.

Data Collection Methodology

The primary source of data in this study was recording and analysis of the 'think-aloud' protocols (Ericsson & Simon, 1984, 1987). In recent years, investigations of reading strategies have their source in the data of subjects' verbal reports (e.g., Anderson, 1991; Barnett, 1988, 1989; Block, 1986, 1992; Cohen & Hosenfield, 1981; Cumming et al., 1989; Davis & Bistodeau, 1993; Horiba, 1990; Sarig, 1987). There are two basic types of self-reports: introspective reports (i.e., think-aloud protocols) and retrospective reports (Ericsson & Simon, 1984, 1987).

In think-aloud protocols, a learner is instructed to report what they are thinking during the accomplishment of the task. Therefore, a researcher can obtain a sequence of the learner's thoughts during the solution of the task, by means of the learner's verbal report (Ericsson & Simon, 1984, 1987). On the other hand, in retrospective reports, the learners are asked to report everything they remember about what they were thinking during the task. Retrospective reports are either collected immediately or shortly after the task completion (Cohen, 1987; Ericsson & Simon, 1984, 1987).

Psychologists and second language researchers have been debating the reliability of think-aloud protocol as a research tool for many years (e.g., Ericsson & Crutcher, 1991; Færch & Kasper, 1987; Howe, 1991; Lyons, 1991; Nunan, 1992; Rankin, 1988; Russo, Johnson, & Stephens, 1989). However, many second language researchers appear to agree that, with careful application, introspective methods are useful indicators of learners' ongoing strategy use (Barnett, 1989; Block, 1986, 1992; Cohen, 1987; Ericsson & Simon, 1987; Horiba, 1990; O'Malley & Chamot, 1990; Oxford & Crookall, 1989; Rankin, 1988; Russo et al., 1989; Sarig, 1987).

O'Malley, Chamot, Stewner-Manzanares, Russo, & Kupper (1985) found that the think-aloud protocols were more productive in identifying the strategies than simply observing the learners' verbal and non-verbal behaviours since it is impossible to observe what really happens inside the mind. Also, some researchers (Abraham & Vann, 1987; Barnett, 1988; Wenden, 1986) revealed that, in retrospection, learners often report what they *believe* they do or they should do for completing the task, not what they *actually* do. Furthermore, in retrospective reports, learners often forget what they were doing or thinking during the task (Cohen, 1987).

However, there are also some limitations of the think-aloud protocols. First, there is still the possibility that the verbalisation of thought itself might affect the learners' mental processes (Russo et al., 1989). In fact, Horiba (1990) observed differences in the degree of reading comprehension between learners who read while verbalising their thoughts and who read without doing so. Second, the total amount of verbalisation will vary across learners (Block, 1986; Cumming et al., 1989; Davis & Bistodeau, 1993; Horiba, 1990; Rankin, 1988; Uzawa & Cumming, 1989). Block (1986) reported that some subjects seemed to experience difficulty with the think-aloud protocols during the accomplishment of the task.

In order to overcome these limitations, think-aloud protocols were combined with other types of process-tracing methods (retrospective interviews and analysis of written recalls) in this study. Also, a demonstration and practice of think-aloud protocols before the data collection sessions were provided for each participant.

The retrospective interviews were semi-structured. Participants were asked such questions as what words were unknown to them, what part was difficult to understand,

and what kind of things they did to solve those problems. To the participants whose verbalisations were relatively few, questions such as what they were thinking when they were quiet were given. These types of questions were asked since this research involved those whose cultural background is Chinese, and this might affect the degree of the participants' verbalisation. In fact, one of the Chinese participants, Carmen, showed some resistance to verbalising her thoughts during the practice session. She explained the reason for her resistance was that, when she saw her Caucasian classmates unintentionally verbalise their thoughts when reading Japanese texts, she considered them to appear 'ridiculous'. In addition, at the end of the interview, the Chinese participants were asked in what language they thought they were thinking while reading Japanese texts. This question was added after a pilot study because a Chinese student who participated in the pilot study reported frequent use of English (i.e., a moderating language) during the task accomplishment.

Furthermore, a free written recall task was administered to obtain additional information to supplement the data collected by the think-aloud protocols. This task was used to obtain information on each participant's overall comprehension of the text in terms of the number of propositions that they remembered from the original texts.

Materials

Japanese Language Assessment

In order to assess the participants' general proficiency in Japanese, the Japanese Language Proficiency Test, Level 3 (Association of International Education, Japan, & the Japan Foundation, 1993) was adopted. This test is the most well known test measuring

L2 Japanese proficiency and is administered once a year within and outside Japan. The version of the test used in this study was the same as that conducted by the Japan Foundation in 1992. The focus of the test is mainly reading and listening. It consists of five sections: listening, orthographies, vocabulary, grammar and reading. All questions are in a multiple-choice format. In scoring the test, the percentage of correct answers was calculated since details concerning the allocation of points to each section are not released to the public.

Reading Passages

Two short passages of expository prose from reading comprehension exercises in the Nihongo Journal were chosen as reading materials for this study. Nihongo Journal is a monthly magazine targeting JSL learners inside and outside Japan. All materials in the language exercise sections are developed by JSL teachers from well-known post-secondary institutes in Japan. There are two reasons why the materials were taken from this source. First, since this magazine is compiled specifically for JSL learners, the passages have been syntactically and semantically controlled by the author and the level of the difficulty of the materials is marked. Yet, the style of the passages is fairly authentic as Japanese texts. Second, the topics of the passages appear not to require the readers to have specific cultural knowledge. Most topics were taken from daily life and general interests.

In the selection of the experimental passages, topic, length, and linguistic difficulties were taken into account (Rankin, 1988). Also, the researcher asked four students in the other section of the second year Japanese course of the same university to read the several

passages that were candidates for the experimental passages and collected their opinions regarding the topic and difficulty of the passages. Finally, two passages were chosen.

Both passages were marked as "upper-beginner" level and most kanji words were written in hiragana in order to increase the simplicity of the passages. Therefore, for the present study, those words were changed into kanji to increase the ratio of kanji contained in the passages to 25 to 30 percent, which is the percentage in an average Japanese sentence according to an estimation by Taylor (1981, cited in Koda, 1988). The characteristics of each passage were summarised in Table 2.

Table 2

Ratio of Each Orthographic Symbol in the Passages

Passage	No. of characters (percentage)				Total	No. of Sentences
	Hiragana	Kanji	Katakana	Numeral		
1	260 (73%)	75 (21%)	20 (6%)	0 (0%)	355 (100%)	16
2	240 (60%)	108 (27%)	38 (10%)	12 (3%)	398 (100%)	15

Passage 1 was titled "Toys." Passage 2 was titled "Waiting Time." Both passages were written using the rhetorical structure called *ki-shoo-ten-ketsu*, which is the most common style in Japanese expository prose (Hinds, 1983; Thomas, 1988). According to Takemata (1976, cited in Hinds, 1983), the organisation of the structure is as presented in Figure 6.

Figure 6. Rhetorical organisation of *ki-shoo-ten-ketsu* (Hinds, 1983).

<i>Ki</i>	begin one's argument.
	↓
<i>Shoo</i>	develop the argument.
	↓
<i>Ten</i>	turn the idea to a sub-theme where there is a connection, but not a directly connected association with the major theme.
	↓
<i>Ketsu</i>	bring all of the above together and reach a conclusion.

Both Passage 1 and Passage 2 consisted of four paragraphs, corresponding to *ki*, *shoo*, *ten*, and *ketsu* respectively. Also, the third item, *ten*, was presented by submitting a contrast element with the content of the previous section, *shoo* in both passages.

The method of presenting each passage to the participants was adopted from Block (1986). Each passage was written on a sheet of paper (Appendix C). A large dot was inserted after each sentence as a reminder to the participants to verbalise their thoughts. After a pilot study, an English translation of a key word was added to the bottom of each passage to prevent the one unknown key word from inhibiting the reader's comprehension of the passage. This modification had been done based on the finding that the participants in the pilot study showed difficulty in understanding one of the passages simply because they did not know the meaning of a word contained in the passage (see the following section for further details of this pilot study.)

Pilot study

A pilot study using two JSL students in the other section of the target course was performed in the first week of March, 1994. The participants were one native speaker of

Mandarin Chinese and one native speaker of Spanish who had native-like proficiency in English. In this study, the Spanish speaker was used in the place of an English speaker because there was no English speaking volunteer with a background similar to those who participated in the full-scale study.

The objective of this pilot study was mainly to ensure the appropriateness of the materials and procedures that were planned for use in the full-scale study. Also, obtaining the preliminary information about students' use of reading strategies was attempted.

The participants were asked to read a Japanese passage, while thinking aloud in English. English was chosen as a language for verbalisation because the participants were considered not to have attained the proficiency level in Japanese to be able to express their thoughts clearly and thoroughly. Also, English has been used as a language for verbalisation in previous studies using think-aloud protocols in JSL contexts (Horiba, 1990; Taniguchi, 1991). Prior to the think-aloud session, one practice session was provided to the participants. After thinking aloud, they were asked to write down, in English, everything that they remembered. In the practice session, one of the prose passages was found too difficult for non-Chinese speakers because of the kanji words included in the passage. In the full-scale study, it was replaced by another piece containing kanji that were fairly familiar to them. The passages used in the pilot study seemed to be appropriate in terms of the length, content, and level of difficulty although both participants showed difficulty in understanding Passage 2 because they did not know the meaning of one word, which was a key word of the passage, as mentioned above. Therefore, the English translation of the word was added to the bottom of the sheet that the passages were written. The same modification was conducted to the other passage in

order to make the presentation of each passage comparable. In the retrospective interview, the Chinese participant commented that she noticed switching languages (English and Chinese) in thinking while reading the passage; that is, she tended to think in English to solve the grammatical problems, but she spontaneously switched to Chinese whenever she had problems with kanji words. Therefore, questions regarding what language they believed they were thinking in were added to the questions for Chinese participants in the retrospective interview to obtain additional information.

Procedures

Pre-data-collection Sessions

The background questionnaires and consent forms were distributed to the participants by the researcher in their classroom and collected in the following class. Also, the researcher established the schedule for all activities for this study based on each participant's free time.

Once the schedule was established, an office room on the campus was arranged for the activities for this study, except a larger classroom was reserved for the Japanese Language Proficiency Test when more than three participants were allocated the same time slot.

All participants took the Japanese proficiency test in the first week of March, 1994, except three participants who had to take the test the following week due to time constraints. During the test, the researcher stayed in the same room and made sure that the test was conducted without any disturbance. The test took approximately two hours.

The following week, the researcher met the participants individually at the office for a practice session of thinking-aloud. First, the researcher demonstrated to a participant how to think-aloud, reading a short passage. Then, the participant practised think-aloud in English while reading a short passage. The researcher sat beside the participant while he/she was thinking-aloud. After the participant finished thinking-aloud, the researcher asked the participant questions, such as "You were fairly quiet here, but what were you thinking?". When he/she explained, then the participant was instructed to verbalise it in the next passage. After this question-and-answer, the participant was given another short passage and read while thinking-aloud. All practice sessions were recorded on the audio tapes to have the participants become accustomed to being recorded. One practice session took approximately 20 minutes.

Think-aloud Session

Each participant met the researcher at the same location used for the practice session on a separate day. Although Rankin (1988) recommends having a practice session immediately before the think-aloud session, this was impossible in this study because of the availability of the participants on each day. Therefore, in the think-aloud session, each participant was first given a short passage and asked to read it while thinking-aloud. Not only did this activity help the participant "warm-up," but also it was useful to assure whether the participant understood clearly what they had to do.

After reading the warming-up passage, the participants were told that they would be given a passage and asked to read it, reporting what they were thinking. They were also told to read for the meaning of the text because they would be asked later to recall it in

English. Furthermore, the participants were instructed not to try to explain to the researcher why they were doing a particular activity. Then, the participants were given one of the two passages. The assignment of the passages to each participant was counter-balanced, so that the order would not affect the performance. While the participants were reading the passage, thinking-aloud their thoughts, the researcher was sitting beside them and taking notes for the retrospective interview. No interference by the researcher occurred, except when the participants kept their silence too long. All participants were allowed to take as much time as they wanted until they felt ready for recall.

When the participants were ready, they were given a sheet of paper on which they were asked to write in English everything remembered of the passage. Participants were also asked to write down their recall protocols in a complete sentence. In the recall task, participants were allowed to spend as much time as they needed. For Chinese participants, the use of an English dictionary was permitted when they asked. After the participants finished writing a written recall, a retrospective interview was held. The participants participated in these activities in the think-aloud sessions individually. The thinking-aloud and retrospective interview were recorded on audio tapes for later analyses. The length of one think-aloud session, including the warming-up passage, writing a written recall and retrospective interview, was approximately 40 minutes in total.

Each participant repeated the same procedures with another passage on a separate day. All sessions were conducted in English, except for Christy who verbalised her thoughts in a mixture of English and Japanese. Each participant completed two think-aloud sessions within one week.

Data Analyses

Transcribing, Segmenting, and Coding of the Protocols

All the tape-recorded think-aloud protocols (approximately four hours) were transcribed by the researcher from April to May, 1994. The protocols of Christy were transcribed and then, the parts verbalised in Japanese were translated into English by the researcher.

For the segmentation of the protocols, pause, intonation, and meaning were used in this study in order to distinguish stretches of verbalisation from one another. Coding was initially conducted using the scheme adapted from Block (1986). The scheme using this initial coding is presented in Figure 7. The interrater reliability using one independent judge on all the passages was 82.9 percent for Passage 1 and 81.3 percent for Passage 2.

However, there are several categories where the frequencies were so low. Therefore, in order to identify the patterns of strategy use more clearly, the categories yielding less than five percent in total frequency for each participant were collapsed with other categories and new categories derived. The scheme used for final analyses is presented in Figure 8.

Figure 7. Initial coding scheme (Adapted from Block, 1986; modified by the researcher).

1. **Anticipate content:** The readers predict what content will occur in succeeding portions of text using such things as titles, topic of the text, and so on.
2. **Recognising text structure:** The readers distinguish between main points and supporting details or discuss the purpose of information.
3. **Integrate information:** The readers connect new information with previously stated content.
4. **Self questioning:** The readers pose questions to themselves in order to a) pay attention to specific aspects of the text, or b) question the significance or veracity of information.
5. **Interpret the text:** The readers make an inference, draw a conclusion, or form a hypothesis about the content.
6. **Use general knowledge and associations:** The readers use their knowledge to a) explain extend and clarify content; b) evaluate the veracity of content; and/or c) react to content.
7. **Comment of behaviour:** The readers describe strategy use, indicating awareness of the components of the process, or expressing a sense of accomplishment or frustration.
8. **Correct behaviour:** The readers notice that an assumption, or interpretation is incorrect and change that statement.
9. **React to the text:** The readers react emotionally to information in the text.
10. **Monitor comprehension:** The readers assess their degrees of understanding of the text in either the discourse level or local level.
11. **Reread:** The readers reread a portion of the text either aloud or silently.
12. **Question meaning of a clause or sentence:** The readers do not understand the meaning of a portion of the text.
13. **Question meaning of a word:** The readers do not understand the meaning of a particular word.
14. **Solve vocabulary problem:** The readers use context, a synonym, or some other word-solving behaviour to understand a particular word.
15. **Translation:** The readers translate a word/phrase/sentence into English in a "word-for-word" manner.

- 16. Structure analysis:** The readers analyse the sentence structure in order to understand the meaning of a phrase/sentence.
- 17. Skipping:** The readers skip words or sentence that they do not understand.

Figure 8. Categories of strategies³

1. **Comments on the Content (CMC):** The readers attempt to understand the content of the text using various types of resources or express their feeling about the content. The readers' focus is strictly on "meaning" of the text. This category contains the following types of comments.
 - a) Prediction on succeeding portions of the text
"So, this is gonna be something to do with toys."
 - b) Recognising the purpose of particular information
"This sentence probably shows the examples of the previous sentence."
 - c) Inference about the content
"Maybe, these are things that are around the child.... like trees and spoons that are toys."
 - d) Questioning to themselves about the content
"Why did they say this?"
 - e) Use general knowledge and associations
"Maybe, it's like.... these toys are not saying different things when... like when you pull the string."
 - f) Reacting to information in the text
"This is what I think interesting...."

2. **Comments on Own Behaviour (CMB):** The readers describe strategy use, indicating awareness of the components of the process, or expressing a sense of accomplishment or frustration.

"(This sentence is very long, so) I have to stop from the first sentence bit by bit."

3. **Monitoring Comprehension (MC):** The readers assess their degrees of understanding of the text in either discourse level or local level.

"... this doesn't seem to be what I've been talking about."
"So, I know that [word] for sure."

4. **Rereading (RR)**
The readers reread portions of the text aloud.

³ The excerpts were taken from actual protocols collected in this study.

5. **Questioning of the Meaning of a Word or Sentence (QM):** The readers do not understand the meaning of particular words, phrase, or sentences.

"I don't understand that sentence. I don't know what that means."
 "Oh, I don't get that, *wazawaza*."

6. **Solving Language Problems (SP)**

The readers attempt to solve problems caused by linguistic elements

"*iki...* and then the second one is '*tatoeba*' no '*tatoe*'."
 "I'm not sure if this '*ga*' is a contrastive '*ga*' with the rest of the sentence or if it is a subject."

7. **Translation (TR)**

The readers translate a word, phrase, or sentence into English in a "word-for-word" manner.

"*Machijikan* means 'waiting time'."

8. **Skipping (SK)**

The readers skip words or sentence that they do not understand.

The tape-recorded interviews (approximately three hours) were also transcribed by the researcher and used as supplemental information for the judgement when the type of strategies appeared in the think-aloud protocol were not clear. Also, it was used as a reference to identify unverbaised strategy use during reading passage. In the case that unverbaised strategy was identified in the transcribed interview, it was included when counting the frequency of strategies.

Scoring of Written Recalls

Each written recall was propositionally analysed, following the procedures recommended by Bovair and Kieras (1985). The passages used in this study were

translated into English (Appendix D) and analysed propositionally. The original passages were divided into propositions by the researcher. A completed list of propositions is presented in Appendix E. The list of the propositions was used for scoring the amount of information contained in participants' recall protocols. The number of propositions that were accurately recalled by each participant was counted and then converted into a percentage. To ensure the reliability of the scoring, interrater reliability was calculated using one independent judge. The reliability was 93.2 percent for Passage 1 and 88.6 percent for Passage 2 on all the written recalls.

CHAPTER 4

Results

This chapter will present the results of the quantitative analyses of collected data in this study. In the first section, the results of the Japanese Language Proficiency Test will be presented as a measure of the participants' proficiency level. Then, the strategy use among the participants will be presented in relation to their L1 background. Also, the use of the word-solving strategy for kanji words, which is presumably highly affected by the difference in knowledge of Chinese characters, will be examined in detail. In the third section, the participants' written recall scores are analysed in relation to the strategy use.

Japanese Language Proficiency Test

Table 3 shows the results of the Japanese Language Proficiency Tests (JLPT) for each participant. The total scores were converted into a percentage for the purpose of the analysis. The range of the converted scores for the group of English native speakers (NSE group) was approximately from 51 to 85 percent and that for the group of Chinese native speakers (NSC group) was approximately from 70 to 97 percent. Table 4 shows the medians and standard deviations in the total scores and scores in each section. The medians of the total scores show that the NSC group obtained higher scores than the NSE group (83.5 for the NSC group and 68.1 for the NSE group). Also, the standard deviations show that the variability of the total scores is smaller in the NSC group than the NSE group (11.0 for the NSC group and 15.6 for the NSE group).

Table 3

Results of the Japanese Language Proficiency Test

Name	Orthography & Vocabulary				Reading Comprehension & Grammar				Total	%
	LST	RDG	RGN	VOC	PCL	WF	MIS	RC		
Elaine	60.0	16.0	12.0	24.0	41.7	45.8	25.0	12.5	237	59.3
Eleanor	36.0	12.0	12.0	29.3	45.8	33.3	29.2	8.3	206	51.5
Ed	84.0	22.7	20.0	48.0	58.3	54.2	29.2	25.0	341	85.3
Eric	72.0	24.0	17.3	40.0	54.2	45.8	37.5	16.7	308	76.9
Colleen	88.0	22.7	20.0	42.7	54.2	54.2	33.3	25.0	340	85.0
Carmen	64.0	24.0	20.0	45.3	50.0	54.2	41.7	29.2	328	82.1
Christy	100.0	26.7	20.0	53.3	58.3	58.3	41.7	29.2	388	96.9
Cathy	56.0	26.7	16.0	40.0	45.8	50.0	29.2	16.7	280	70.1

Notes. The full score of each section is as follows: Listening Comprehension = 100;

Orthography and Vocabulary = 100; Reading Comprehension and Grammar = 200. LST

= Listening Comprehension; RDG = Kanji Readings; RGN = Kanji Recognition; VOC =

Vocabulary; PCL = Particles; WF = Word Form; MIS = Miscellaneous; RC = Reading

Comprehension.

Table 4

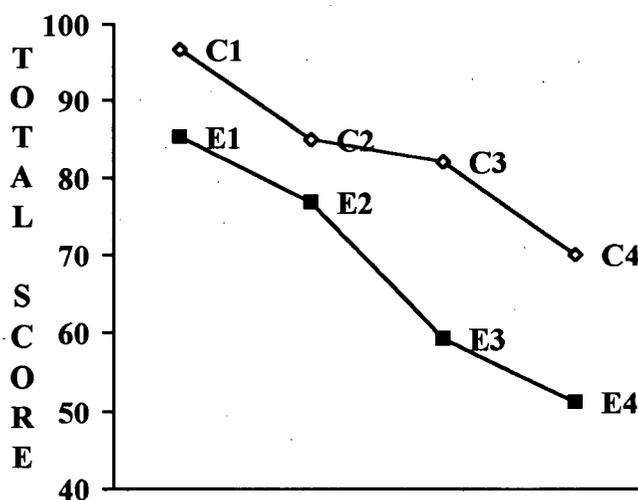
Medians and Standard Deviations of Scores in Individual Sections of JLPT

Group	Orthography & Vocabulary				Reading Comprehension & Grammar				Total(%)
	LST	RDG	RGN	VOC	PCL	WF	MIS	RC	
NSE	66.0	19.3	14.7	34.7	50.0	45.8	29.2	14.6	68.1
	(20.5)	(5.7)	(4.0)	(10.7)	(7.6)	(8.6)	(5.2)	(7.1)	(15.6)
NSC	76.0	25.3	20.0	44.0	52.1	54.2	37.5	27.1	83.5
	(20.5)	(2.0)	(2.0)	(5.8)	(5.4)	(3.4)	(6.3)	(5.9)	(11.0)

Note. The figures in the parentheses are standard deviations.

The distribution of the total scores in each group is shown in Figure 9. This figure again shows the superiority of participants in the NSC group in the total scores of this proficiency test. Figure 9 also shows that two participants in the NSE group, Elaine and Eleanor, achieved much lower scores than other participants. This indicates that the NSE group actually consists of participants with two proficiency levels: intermediate and slightly lower than intermediate.

Figure 9. Comparison of total scores of JLPT in the two language groups (by converted scores).



In descending order of scores within each group: C1 = Christy; C2 = Colleen; C3 = Carmen; C4 = Cathy; E1 = Ed; E2 = Eric; E3 = Elaine; and E4 = Eleanor.

In terms of the scores in individual sections, Table 4 shows that the medians of the NSC group were higher than those of the NSE group. However, it appears that the scores of the low proficiency participants, Elaine and Eleanor, lowered the median of the NSE

group. Therefore, a Mann-Whitney U test was performed to identify if the differences in the two language groups were statistically significant. Table 5 presents the summary of the observed U values.

The results of U tests show that the differences between the NSE group and NSC group did not reach statistical significance. These results may indicate that the low median of the NSE group in fact resulted from the low scores of Elaine and Eleanor and that there is no large differences among the rest of the participants.

Table 5

Observed U Values on the Scores of Individual Sections in JLPT (NSE vs. NSC Group)

Sections	U value
LST	5
RDG	2
RGN	3.5
VOC	3.5
PCL	6.5
WF	2
MIS	3
RC	2

Strategy Use

Overall Use of Each Strategy Category

The total raw frequency of reported strategy categories for each participant had a wide range: from 30 to 228 in Passage 1 and 27 to 215 in Passage 2. Table 6 presents the raw frequencies of strategies used by each participant. In general, the participants in the NSE group verbalised their strategy use more frequently than those in the NSC group. Figure 10 shows the range of total frequency of strategies in each group. One might argue that the difference in the amount of the verbalised strategy could be due to the fact that English is the first language for the NSE group, but the second language for the NSC group; the verbalisation in readers' first languages might increase the amount of the verbalisation since they may feel more comfortable with doing so. However, Cathy verbalised her strategy use far more frequently than her peers in the two passages (142 times in Passage 1 and 141 times in Passage 2) and, in fact, these frequencies were higher than some of these found in the NSE group. This may suggest that the degree of one's verbalisation of strategy use is not necessarily influenced exclusively by the person's ability in the language used for think-aloud protocol (TA protocol hereafter). The distribution of the raw scores is almost the same in the NSC group regardless of the passage (30 to 142 in Passage 1 and 27 to 141 in Passage 2), while it is slightly different among the NSE readers (91 to 228 in Passage 1 and 121 to 215 in Passage 2).

Table 6

Raw Frequencies of Each Strategy by Individual Participants (by Times)

Passage 1

Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CMC	18	44	23	34	18	13	15	23
CMB	21	49	8	25	1	3	6	19
MC	43	19	14	30	1	11	30	19
RR	60	8	15	32	1	12	8	36
QM	23	16	6	22	1	6	2	11
SLP	16	17	5	12	4	4	8	16
TR	31	27	13	23	2	4	0	15
SK	16	6	7	7	2	5	0	3
Total	228	186	91	185	30	58	69	142

Passage 2

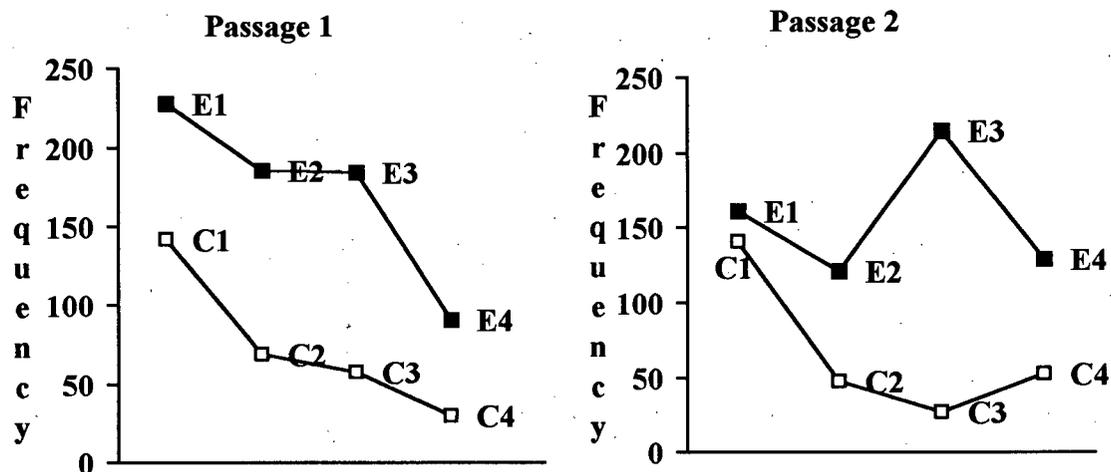
Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CMC	41	36	45	37	21	12	15	32
CMB	24	23	5	29	0	1	9	10
MC	38	16	26	33	8	1	13	12
RR	15	4	21	42	5	3	7	28
QM	14	10	10	20	4	2	2	10
SLP	6	8	15	16	6	4	1	18
TR	14	19	5	33	8	1	1	30
SK	9	5	2	5	1	3	0	1
Total	161	121	129	215	53	27	48	141

Note. CMC = Comment on Content; CMB = Comment on Own Behaviour; MC =

Monitoring Comprehension; RR = Rereading; QM = Questioning the Meaning of a Word

or Sentence; SLP = Solving Language Problems; TR = Translation; and SK = Skipping.

Figure 10. Comparison of total frequencies of reported strategies in each group (by times).



Legend: C1 = Cathy; C2 = Christy; C3 = Carmen; C4 = Colleen; E1 = Elaine; E2 = Eleanor; E3 = Eric; and E4 = Ed. Frequencies in Passage 1 are in descending order within each group.

Since there is a great deal of difference in the degree of verbalisation among the participants, the raw frequency of each type of strategies used by individual participants was transformed into a proportion of total frequency for further analysis. Table 7 shows the proportions of the strategies for each participant. Overall, Comment on the Content and Monitoring Comprehension shows higher proportions than other categories in both groups regardless of the passages. Also, the proportions of translation in the NSE group are higher than those in the NSC group in reading Passage 1.

Table 7

Strategy Use of Each Participant (by Percentage Proportion)

Passage 1

Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CMC	7.9	23.7	25.3	18.4	60.0	22.4	21.7	16.2
CMB	9.2	26.3	8.8	13.5	3.3	5.2	8.7	13.4
MC	18.9	10.2	15.4	16.2	3.3	19.0	43.5	13.4
RR	26.3	4.3	16.5	17.3	3.3	20.7	11.6	25.4
QM	10.1	8.6	6.6	11.9	3.3	10.3	2.9	7.7
SLP	7.0	9.1	5.5	6.5	13.3	6.9	11.6	11.3
TR	13.6	14.5	14.3	12.4	6.7	6.9	0.0	10.6
SK	7.0	3.2	7.7	3.8	6.7	8.6	0.0	2.1
Total	100.0	99.9	100.1	100.0	99.9	100.0	100.0	100.1

Passage 2

Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CMC	25.5	29.8	34.9	17.2	39.6	44.4	31.3	22.7
CMB	14.9	19.0	3.9	13.5	0.0	3.7	18.8	7.1
MC	23.6	13.2	20.2	15.3	15.1	3.7	27.1	8.5
RR	9.3	3.3	16.3	19.5	9.4	11.1	14.6	19.9
QM	8.7	8.3	7.8	9.3	7.5	7.4	4.2	7.1
SLP	3.7	6.6	11.6	7.4	11.3	14.8	2.1	12.8
TR	8.7	15.7	3.9	15.3	15.1	3.7	2.1	21.3
SK	5.6	4.1	1.6	2.3	1.9	11.1	0.0	0.7
Total	100.0	100.0	100.2	99.8	99.9	99.9	100.2	100.1

Note. Some percentages total slightly more or less than 100 due to rounding.

However, it is not very clear if there are any significant differences between the NSE group and NSC group in terms of strategy use since it appears that there is no specific pattern that discriminates one group from the other. For instance, the participants of the NSE group used Comment on Own Behaviour in a fairly large proportion in the two passages (approximately 10 to 26 percent in Passage 1 and three 4 to 19 percent in Passage 2). Nevertheless, the proportion of the same strategy is relatively small for Ed in Passage 2 (3.9 percent). In the NSC group, on the other hand, the proportions of Comment on Own Behaviour are fairly small for Colleen and Carmen in both passages (3.3 percent and 5.2 percent, respectively, in Passage 1 and, 0.0 percent and 3.7 percent in Passage 2). However, Cathy in Passage 1 and Christy in Passage 2 reported the same strategy fairly frequently (13.4 percent and 18.8 percent, respectively). This indicates that there may be no particular strategy that is more frequently used by all the members of one group.

Therefore, the two-way Mann-Whitney U test was performed to determine if there are any significant differences in the proportion of each strategy between the two groups. Table 8 shows the observed U value in each strategy category. Since the number of participants was extremely small, the U value was calculated following the procedures recommended by Spatz (1993). The results show that Translation in Passage 1 and Questioning the Meaning of a Word or Sentence in Passage 2 are statistically significant at $\alpha=.05$ level. This result suggests that these NSE readers tended to use the verbatim translation more frequently than the NSC group in order to comprehend the content of Passage 1. Also, the result suggests that the NSE readers might experience problems in

understanding the meanings of words, phrases, and sentences more often than the NSC group in reading Passage 2. However, there are no statistically significant differences in other categories. These results show that for these few participants the differences are not sufficient enough to reject the null hypothesis (i.e., there is no difference between the two groups). This suggests that the differences in the strategy use among the participants may not have resulted from their language background, but from other factors such as the way in which the passage was written and the individual differences among the participants.

Table 8

Observed U Values on Strategy Use in Each Passage (NSE vs. NSC Group)

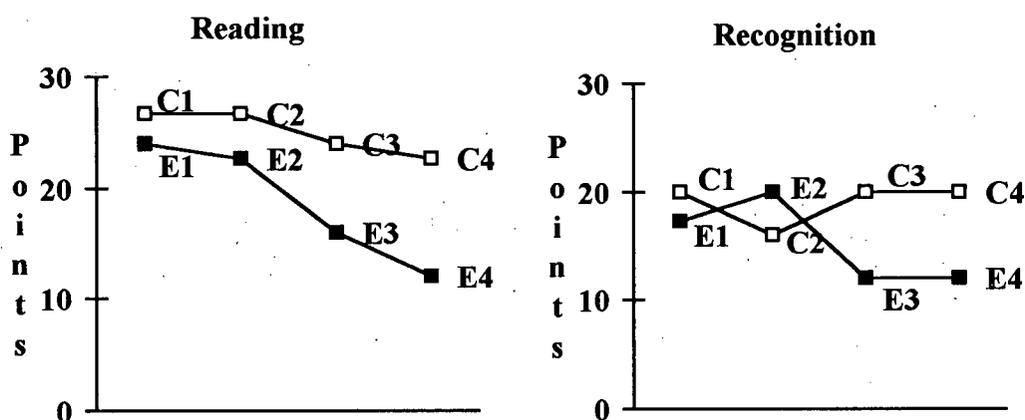
Strategy	Passage 1	Passage 2
CMC	9	12
CMB	2	4
MC	9	5
RR	7	10
QM	4	0*
SLP	14	12
TR	0*	6
SK	6	5

Note. * Statistically significant at $\alpha = .05$ level.

Word-Problem Solving Strategies for Unknown Kanji Words

As discussed in Chapter 2, the most evident factor that discriminates the NSE group from the NSC group is the amount of knowledge of Chinese characters. Figure 11 shows that the score distribution of the two sections of JLPT of the participants. The results of the JLPT show that there is no notable difference among the participants, except the two lower proficiency participants, in scores of the two kanji sections: Kanji reading and kanji recognition.

Figure 11. Score distribution of the kanji sections in JLPT.



The full points of the two sections are: Kanji Reading = 27 points; Kanji Recognition = 20.

Legend: C1 = Christy; C2 = Cathy; C3 = Carmen; C4 = Colleen; E1 = Eric; E2 = Ed; E3 = Elaine; and E4 = Eleanor. Points in the kanji reading section are in descending order.

However, since the reading materials contained several kanji characters that most participants had not learned in the classroom before, it is possible that the fundamental difference in the knowledge of Chinese characters may affect how the readers solve

problems of understanding the meanings of unknown kanji words. Therefore, in order to observe how each participant solved the vocabulary related problems, the ways in which the participants guessed the meanings of unknown words were extracted and categorised in terms of the sources for the problem solving.

The categories are constructed based on the source of inferring the meaning of unknown words: context clues, knowledge of Chinese language, knowledge of known kanji used in the target word, and other types of sources. The last category, named "Others," includes the use of "*Okurigana*," general knowledge on topic or content of the passage, sounds of the words, word form of the word, and position of the word in the sentence.

The "*Okurigana*" refers to the hiragana part of verbs, adjectives, and adverbs, which shows the inflection of these words. For instance, a verb, 並ぶ (to line up) can be divided into the two parts: the word stem "並" and the inflection part "ぶ". The latter part is called "*Okurigana*." Figure 12 shows the example of how a JSL reader can use *Okurigana* as a source of vocabulary problem solving. In this example, the reader cannot recognise the correct reading of the kanji character, so that she cannot determine the meaning of the word. However, since *Okurigana* is written in hiragana, she can know that the word-ending has the sound of [bu]. Then she uses that information as a clue to find out the most probable reading of the kanji character, and searches the words with [bu] in their word-endings, such as [aso-bu], [to-bu], and [mana-bu]. Then she chooses the most probable one among the alternatives that she would have found. The last decision can be

made by referring to other available information, such as the context or discourse of the passage or, possibly without any reference at all.

Figure 12. Example of the steps of kanji- problem solving using *Okurigana*.

Target word: 並ぶ [nara-bu] (to stand in line)

The reader does not recognise the reading of the kanji character "並"



She searches the word with *Okurigana* "ぶ" [bu] in her memory.



She finds the word [mana-bu] (to study) as the reading of the target word.



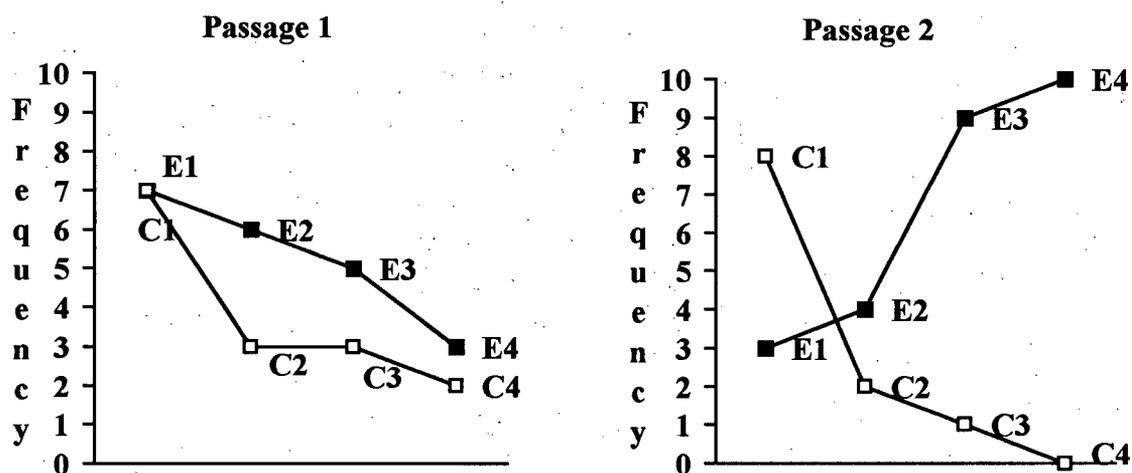
She interprets the phrase/sentence according to the meaning of the word.

The category, Use of Known Kanji is determined when the participant knew the meaning of any of the kanji in the target kanji word and applied that knowledge in order to infer the meaning of the whole word. In case of the NSC group, the judgement of Use of Chinese knowledge was made when the participants explicitly expressed, in either TA protocols or retrospective interviews, that they did not know the meaning of the word in Japanese and applied the meaning of the characters in Chinese language to understand the word.

Figure 13 presents the raw frequencies of word-solving strategies for kanji in the two passages. In a comparison of the total frequencies of the two language groups, the NSE group used the word problem solving strategies more frequently than the NSC group in both passages (21 times and 15 times, respectively, in Passage 1 and 26 times and 11

times, respectively, in Passage 2). This data implies that the NSE group might experience difficulty in understanding the unknown kanji words more frequently than the NSC group.

Figure 13. Comparison of raw frequencies in kanji-problem solving strategies between measures of the two language groups.



Legend: C1 = Cathy; C2 = Colleen; C3 = Christy; C4 = Carmen; E1 = Eleanor; E2 = Elaine; E3 = Eric, and E4 = Ed. Frequencies in Passage 1 are in descending order within each group.

Regarding the use of each sub-category of the kanji-problem solving strategies, the raw frequencies of the sub-categories for each participant were converted to proportions in order to eliminate the differences in the verbalisation. The results are presented in Table 9.

Table 9

Use of Word-Problem Solving Strategies for Kanji Words by Each Participant (by Percentage Proportion)

Passage 1

Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CXT	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0
CHK	n/a	n/a	n/a	n/a	33.3	50.0	0.0	57.1
KNK	83.3	85.7	100.0	60.0	66.7	50.0	33.3	14.3
OTH	16.7	14.3	0.0	40.0	0.0	0.0	33.3	28.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0

Passage 2

Strategy	NSE				NSC			
	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
CXT	0.0	0.0	30.0	44.4	0.0	0.0	0.0	0.0
CHK	n/a	n/a	n/a	n/a	50.0	0.0	0.0	100.0
KNK	75.0	100.0	50.0	44.4	50.0	100.0	0.0	0.0
OTH	25.0	0.0	20.0	11.1	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	99.9	100.0	100.0	0.0	100.0

Note. Some percentages total to slightly more or less than 100 due to rounding. CXT = Context Clues; CHK = Use of Chinese Knowledge; KNK = Use of Known Kanji; and OTH = Other Types of Strategies.

The most common strategy to solve problems of kanji words were, regardless of the reader's language background, using the kanji character itself as a clue; using known kanji characters in the target words as a clue or, in the case of the NSC group, understanding

the target words as Chinese words. For example, in Passage 1, all the participants, except Christy, used either strategies in about 50 percent or more of the situations where they did not understand the meaning of kanji words.

The result also shows that both groups, except Christy, did not use the context clues at all in Passage 1. Although Christy used the context clues in guessing the meanings of kanji words, the raw frequency was very low; she used it only once. This tendency of the low frequency of context clues in the NSC group was also observed in reading Passage 2 (0.0 for all the readers in the group). However, interestingly, two readers in the NSE group, Eric and Ed, used the context clues to solve kanji word problems in fairly high proportions (30 percent and 44.4 percent respectively) in Passage 2. This result may imply that the NSC readers are more likely to depend on kanji characters alone as a source of information to understand the meaning of unknown kanji words than the NSE group in Passage 2.

Recall Scores

Comparison of Written Recall Scores

In this study, the written recall task was used as a measurement of reading comprehension. Table 10 presents the scores of written recalls for each participant and the increase in scores between Passage 1 and Passage 2. Also, Figure 14 shows the distribution of the recall scores in each group. The written recalls were firstly scored in terms of the number of propositions that were accurately recalled by the participant, and

then the number was converted into a percentage of propositions contained in the original passage.

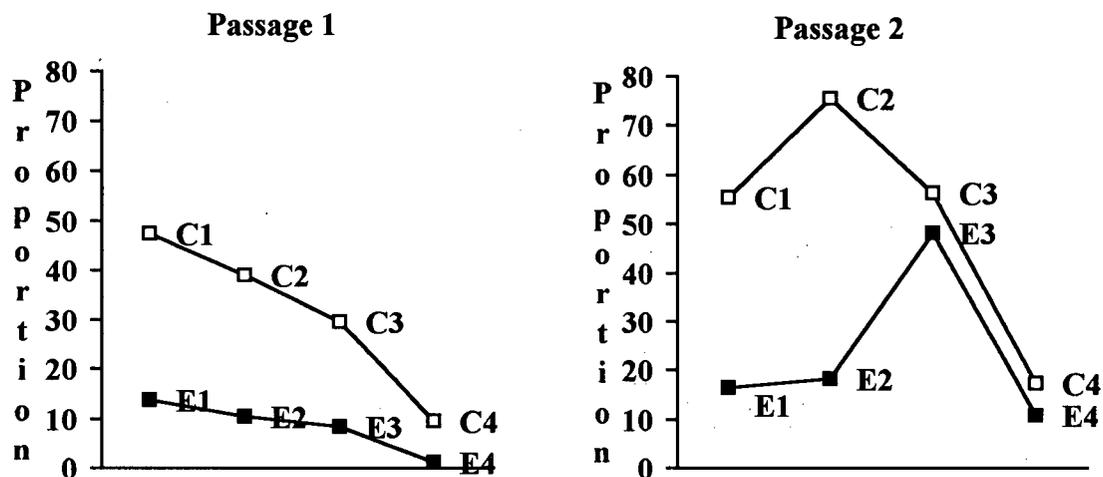
Table 10

Scores of Written Recalls of Individual Participants (by Percentage of Total)

Passage	Elaine	Eleanor	Ed	Eric	Colleen	Carmen	Christy	Cathy
1	1.1	10.5	13.7	8.4	47.4	9.5	39.0	29.5
2	10.9	18.2	16.4	48.2	55.5	17.3	75.5	56.4
Increase rate ^a	9.91	1.73	1.20	5.74	1.17	1.82	1.94	1.91

^aThese figures indicate that how many times each score of the same participant in Passage 2 increased from that in Passage 1.

Figure 14. Comparison of recall scores between the two language groups (by percentage of the total).



Legend: C1 = Colleen; C2 = Christy; C3 = Cathy; C4 = Carmen; E1 = Ed; E2 = Eleanor; E3 = Eric; and E4 = Elaine. Scores in Passage 1 are in descending order within each group.

As shown, all the participants scores in reading were higher in Passage 2. Although there are some differences in the degree to which how many times their scores increased, six out of eight participants gained their recall scores in Passage 2 approximately twice as much as those in Passage 1. This suggests that it was more difficult for most participants to remember the content of Passage 1, which was about children's toys, than that of Passage 2, which was about waiting time. In fact, after reading both passages, all the participants commented that Passage 1 was more difficult to understand than Passage 2 in terms of the content and vocabulary. Also, all the members in the NSC group, except

Carmen, outperformed the NSE group on both passages in the recall task; the NSC group could recall more propositions in both passages than the NSE group.

However, there is also variability among the scores within each group. In the NSC group, Carmen's scores were very low in both passages compared to those of her peers. In the NSE group, on the other hand, all had fairly low scores in Passage 1. Eric, however, outperformed his peers in Passage 2 and his score is closer to those of the NSC group than those of his peers. Considering the fact that these two participants, Carmen and Eric, are at a similar proficiency level of Japanese (see the first section, Japanese Language Proficiency Test, in this chapter), this result may suggest that factors other than their L1 background (i.e., L1 with or without Chinese characters) might affect their performance in written recall task in Japanese.

Recall Scores and Strategy Use

In order to investigate if there is any relationship between the use of specific strategies and the participants' recall scores, Spearman's r_s was calculated, following the procedures recommended by Spatz (1993). The observed values of r_s are presented in Table 11.

The results show that Questioning the Meanings of a Word or Sentence is statistically significant (-.88) in Passage 1 at $\alpha=.05$ level. Also, the figure indicates a strong correlation in a negative direction between the recall scores and frequency of Questioning the Meaning of a Word or Sentence. In other words, the more frequently the participants questioned the meanings of sentences, phrases, or words, the lower their

recall scores were. However, no types of strategies were significantly correlated with the recall scores, either negatively or positively, in Passage 2. This result suggests that, in Passage 1, if participants had problems in understanding the meanings of words, phrases or sentences, they were likely to perform poorly in the recall task, but not in the same task in Passage 2.

Table 11

Correlations between Strategy Use and Recall Scores in the Two Passages

Strategy	Passage 1	Passage 2
CMC	0.55	-0.14
CMB	-0.48	0.07
MC	-0.36	-0.02
RR	-0.64	0.40
QM	-0.88*	-0.62
SLP	0.69	-0.12
TR	-0.55	0.14
SK	-0.43	-0.17

* $p < .05$

Summary

In this chapter, the results of the quantitative analyses of the collected data were presented. The results of the Japanese Language Proficiency Test indicate that there is no statistically significant difference in scores of the individual sections in the proficiency test

between the two groups. However, the distribution of the total scores shows that the NSE group contains two participants, Elaine and Eleanor, whose proficiency levels are slightly lower than the intermediate level. Furthermore, the results of Mann-Whitney U tests showed no statistical significance in terms of the differences in scores of individual sections in the proficiency test. This may suggest that, except Elaine and Eleanor, all the participants had attained similar proficiency levels in Japanese.

As for the strategy use, the results of Mann-Whitney U tests showed that the NSE group used the verbatim translation in Passage 1 and Questioning the Meaning of a Word or Sentence in Passage 2 more frequently than the NSC group. However, there were no statistically significant differences in strategy use with respect to other types of strategies. There was no one common strategy between the two passages that distinguishes one language group from the other. This seems to suggest that the differences between the two groups in strategy use may be influenced by factors other than their language background, such as the type of the passage that they read or the individual differences among the participants.

In terms of vocabulary problem solving, both the NSE and NSC groups used kanji as a main source for inferring the meaning of unknown kanji words. The two NSE readers, Ed and Eric, also used the context fairly often in order to solve the kanji problem in reading Passage 2, while the NSC group was independently relying on the kanji themselves.

Furthermore, the written recall scores show the superiority of the NSC group over the NSE group. Nevertheless, individual differences were also observed. Carmen, the

NSC reader, performed much more poorly than the rest of the NSC readers in both passages. On the other hand, the performance of Eric, the NSE reader, was dramatically better in Passage 2; he recalled six times as much content as he could in Passage 1.

Finally, the Spearman's Correlation Coefficient showed that Questioning the Meaning of a Word or Sentence is significantly correlated to the participants' performance in the written recall task in Passage 1, but no significant correlation was observed in Passage 2. This implies that language decoding problems, such as understanding the word meanings, may have larger impact on the comprehension in Passage 1 but not necessarily so in reading Passage 2.

All the results reported in this chapter and their possible implication will be discussed in the next chapter.

CHAPTER 5

Discussion

In this chapter, the results of the quantitative analyses will be reviewed and discussed according to three aspects: the type of reading strategies, strategy use in terms of the language background, and the strategy use in terms of the effectiveness in reading. Furthermore, the qualitative data from think-aloud protocols and written recalls will be presented in order to examine the subtle characteristics and differences in the strategy use among the participants; particularly in terms of the language background and scores of the written recall task.

The Types of Reading Strategies Used by the JSL Readers

The first research question was what types of reading strategies the JSL readers used in comprehending Japanese texts. In this study eight types of strategies emerged in total. Overall, the types of strategies used by the JSL readers in this study were similar to those that had been found in the previous studies in the non-JSL context, except the use of verbatim translation. A review of the previous L2 reading strategy studies that used think-aloud protocols (TA protocols hereafter) shows that many of those studies did not include verbatim translation of the target languages into other languages in the strategy categories (e.g., Block, 1986; Sarig, 1987; Horiba, 1990). Even if researchers recognised it as one type of strategy, the reported frequencies of the verbatim translation were fairly low (e.g., Anderson, 1991). The participants in this study, both the NSE and some of the NSC readers, however, used the verbatim translation to some extent in reading the experiment

passages. In particular, Eleanor, Eric and Cathy used the translation strategy more than ten percent of their total strategy use in both passages.

There are a few possibilities regarding why the participants used the verbatim translation in comprehending the passages. One of the possible causes is that the research procedures may have encouraged the participants to use translation during the data collection activities. Many of the previous studies used the ESL readers, and usually the language used in the passage are compatible with that used in the verbal report of the thought processes (e.g., Block 1986; Sarig, 1987). In contrast, the participants in this study were asked to verbalise their thoughts and recall what they read in English. This procedure may encourage the readers to use verbatim translation in order to report what they were thinking clearly and remember the content of the passage.

Another possible cause of frequent use of translation might be the instruction that they have received. The participants were considered intermediate readers, yet their abilities in speaking Japanese were fairly limited. Therefore, English was often used in the classroom instruction and activities. In particular, the occasional use of English is necessary to determine if the students understand abstract concepts or complex matters written in texts. Therefore, the participants in this study were accustomed to use translation from Japanese to English in their learning environment. This, again, may contrast with the ESL context; all instructions are often given in English in the intermediate level. Therefore, the differences in the instructional languages may affect the way and frequency that the readers use the translation as reading strategies.

Strategy Use: NSE Readers versus NSC Readers

The second research question is whether there are any specific differences in the pattern of strategy use between the NSE group and NSC group. The two issues will be discussed in relation to this question. The first is regarding the overall use of strategies in the two language groups. The second is concerning the difference in word solving strategies for kanji words between the two groups.

Overall Strategy Use

The results of Mann-Whitney U tests showed that the use of two strategies was statistically significant; the NSE group tended to use a higher proportion of Translation in Passage 1 and of Questioning the Meaning of a Word or Sentence in Passage 2 than the NSC group. However, there is no single strategy that distinguishes one language group from the other in both passages. This appears to suggest that readers' language background was not the only factor to distinguish one language group from the other in terms of strategy use.

In Passage 1, the NSE readers used Translation strategy more frequently than the NSC readers. The TA protocols show that all the NSE readers struggled to understand the passage because of the existence of many unknown kanji words in the passage. For instance, Eric's TA protocol for sentence 14 shows his frustration (*italics indicate words where the participant read Japanese words aloud but translated here for the convenience; parenthesis indicates the kanji words that the participant skipped; Roman types indicate words the participant spoke in English*):

.....Anyways.... uh.... Ayahhhh! More kanji that I don't know. uh.... (*box*), *spoon*....
 What's that? *spoon*... what's that? something *also spoon*... *spoon*.... spoon? spoon?
 spoon, *also*....*tree*... *of*....Oh! Goodness! (*leaves*) *all of them are toys*....

In most cases, the NSE readers tried to use various types of word solving strategies: such as word form, guessing the reading of kanji from the *okurigana*, and so forth. However, when those readers were unable to reach any kind of inference, they used the strategy that Huckin and Bloch (1993) called "pothole"; they skipped the word and tried to reconstruct the sentence from the segments around the unknown word(s). In Passage 1, Eric could not infer the meaning of ten kanji words and skipped them. To an even greater extreme, Elaine skipped most kanji words contained in this passage.

In contrast, the TA protocols of the NSC readers show that those readers did not experience this type of struggle or frustration regarding the kanji words. It appears that the NSC readers knew more of the kanji words in Passage 1 than the NSE reader did. In addition, even though they did not know a kanji word, they easily solved the problem by understanding the kanji characters in Chinese. Cathy, for example, claimed the several kanji compounds as unknown to her. However, she solved her problem by understanding the words as Chinese words:

...and the kanji, I don't know. Maybe it should mean 'calculation' according to Chinese.

Here, she had not learned the word, 計算 (calculation), as Japanese before, but she simply used the meaning of the combination of the same characters in Chinese and interpreted the sentence successfully.

Not knowing so many words in the passage appeared to require the NSE readers to spend much of their short-term memory capacity for guessing the meaning of those words.

As result, enough memory capacity might not be left to the NSE readers for activating higher-level processing. Consequently, the NSE readers may have been forced to rely on the lower-level processing, i.e., translating each segment of the sentence and reconstructing the whole sentence by gathering those translated segments.

Furthermore, the content of Passage 1 seemed unfamiliar to all the participants. As previous L2 reading studies show, familiarity with the content area increases the amount that a reader can comprehend (Carrell, 1984). The Passage 1, arguing that hi-tech toys for young children may not be as good as most young mothers think, appears somehow more abstract and the topic of the passage, about the relationship between mothers and children, is presumably not closely related to these readers' daily lives. On the other hand, the topic of Passage 2 is 'waiting time' and they are more likely to have similar experiences to those described in the passage. This unfamiliarity of the topic of Passage 1 might have inhibited the NSE readers from using their general knowledge to compensate for their inferiority in understanding or guessing the meaning of those kanji words. In contrast, the NSC readers could overcome the unfamiliarity with the topic by applying their knowledge of Chinese language to understand the kanji words. Unfamiliarity with the topic and too many unknown kanji words had a combined effect on the NSE readers' comprehension process and, consequently, might have led the NSE readers to use the verbatim translation.

In Passage 2, however, this effect of the kanji knowledge appeared to be weak. In Passage 2, use of Questioning the Meaning of a Word or Sentence was a statistically significant difference between the two language groups: the NSE group used that strategy more frequently than the NSC readers. This suggests that, in Passage 2, the NSE readers

experienced more difficulty in understanding words, phrases, and sentences than the NSC readers. This result was supported by the participants' TA protocols. Compared to reading Passage 1, they could understand the meanings of kanji words more frequently. Yet, the NSE readers still had a greater number of unknown kanji words than the NSC readers. In Passage 2, however, the NSE group attempted to infer the meanings of the unknown kanji words more frequently. Also, the NSE readers successfully guessed the meanings of more unknown words than in Passage 1. In particular, this behaviour was more evident with the two NSE readers, Eric and Ed, who attained the intermediate proficiency level of Japanese. This implies that knowing more kanji words enables the NSE readers to understand a larger portion of the text in reading Passage 2 and that, consequently, the readers could construct the grounds for inferring the meanings of those unknown kanji words.

Nevertheless, the effect of the kanji knowledge on the participants' reading processes seems to vary depending on the individual participants. For instance, Eric's TA protocol shows that he knew more kanji words in Passage 2 than in Passage 1. However, he also used Translation more frequently in Passage 2 than in Passage 1 (12.4 percent in Passage 1 and 15.3 percent in Passage 2). In contrast, the proportions of the same strategy used by Elaine and Ed were much smaller in Passage 2 than Passage 1 (8.7 percent in Passage 2 and 13.6 percent Passage 1 for Elaine, and 3.9 percent and 14.3 percent for Ed). Moreover, Cathy and Colleen used Translation strategy in fairly high proportion in Passage 2 (15.1 percent for Colleen and 21.3 percent for Cathy). Together with the fact that there was no single strategy that discriminates one language group from the other, the

results of this study seem to suggest that the readers' language backgrounds as well as characteristics of individual readers and of passages are involved in reading strategy use and comprehensions in JSL.

Word-Problem Solving Strategies

As presented in the previous chapter, there are distinctive differences between the two language groups in how each group solved the kanji word problems. The analysis of word-problem solving strategy for kanji words shows that the NSC readers predominantly used the kanji characters in the target word as a primary source of the information for inferring the word meanings. This has been done by either using their kanji knowledge in Japanese or understanding the kanji characters in Chinese. On the other hand, the NSE readers used a wider variety of strategies; in addition to use of the meaning of known kanji characters, the NSE readers used the context, and other types of strategies, such as attending *okurigana* (see the Chapter 3 for clarification of *okurigana*), readings of the kanji, and word form. These strategies have also been observed in other JSL studies (Lee, 1993; Taniguchi, 1991). Interestingly, however, the use of known kanji was much higher than other types of strategies. This implies that the English native readers also actively use their kanji knowledge in order to guess the meaning of unknown kanji words, although their knowledge is much more limited than the Chinese native readers.

This difference in word problem solving between the two language groups had been predicted due to the semantic compatibility of kanji (or Chinese characters) between Japanese and Chinese (see Chapter 2 for the discussion on this issue.) In addition, the

nature of the kanji characters (i.e., each character represents a morpheme), also had the English native speakers use their kanji knowledge actively in order to guess the meaning of the kanji words as well as other types of strategies to substitute their limited knowledge.

However, there are subtle differences among the NSE readers in the way that they solved vocabulary problems between Passage 1 and Passage 2. In Passage 1, all in the NSE group tried to infer the meaning of unknown kanji words by focusing on the word form; using the meaning of known kanji in the target words, pronouncing the kanji repeatedly to assist the search of the target word in their memory, attending the *okurigana*, and the form of the target word. The NSE reader did not use the context clues, such as looking for the keywords in the same sentence that provide them with some clue or using the general knowledge or world knowledge to infer the meaning of the word.

In Passage 2, however, Ed and Eric used context as a source of inferring the meaning of the unknown words in addition to the strategies they used for Passage 1. These two NSE readers used the context either independently or in conjunction with other types of vocabulary solving strategies. For instance, Eric did not know the word, 調査結果 (the result of investigation). This word is a compound noun, in which two independent nouns 調査 (investigation or survey) and 結果 (results) are joined into one. In his TA protocol, Eric fixated on the part containing the target word to find out any clue.

[After reading the word 調査結果] Oh, my goodness! Very large kanji... that I have no idea what that is.... What's that? Something....*appeared in a newspaper* It's come out in the... in the paper... something....some..... Holy cow! I have no idea what that kanji is. That's gonna be a problem, I think. *it appeared in the newspaper.* It's come out in the paper. [He read the sentence from the beginning] Something... It's come out in the paper.

In this protocol, Eric seems to have noticed that the phrase "appeared in a newspaper," which immediately followed the target word, was a key word to guess the meaning of the 調査結果. Also, he related in the retrospective interview that he noticed that the first kanji character 調 might mean 'investigation'. Nevertheless, he could not produce one hypothesis about the meaning of the whole word at this point, so he moved to the next sentence. Eric still did not have any clue as to what the target word meant when he finished reading the first paragraph. Therefore, he moved to the next paragraph. At the moment he read the beginning of the next paragraph, Eric noticed that it contained half of the target word 調査. His protocol reads as follows:

This something..... According to....this.... maybe, statement or theory or explanation.....

Here, Eric seems to have used the phrase 'according to' as a clue-word and searched the word that might commonly follow the phrase. Also, it appears that he used the previously obtained clue; that is, 'something' appeared in a newspaper. Then, he generated a hypothesis that the target word might mean either 'statement', 'theory', or 'explanation'.

In his written recall, he used the word 'a survey' for the target word. In the retrospective interview, Eric explained how he finally decided the meaning of this word:

It's a guess. I was.... I just took a look at the... at all the stuff and fact that they actually have numbers and.... and comparisons between the things. Then I thought, "OK. All those number and comparisons might be a survey." So... I just... That's basically how I guessed.

As in the preceding passage, Eric apparently noticed the text structures of the passage; it contained many numbers and comparisons. At that point, he searched his memory for what might have contained that type of information. Using this clue, he revised his first hypothesis and then finally decided the meaning of the target word might be 'a survey'.

However, when he read the beginning of the second paragraph, he generated a hypothesis. Eric could guess the meanings of three out of ten unknown kanji words successfully using a similar approach.

The other NSE reader, Ed, used the context in the similar way to Eric. Ed, for instance, did not know the word 年齡 (age).

something... uh... *year* or... maybe... I don't know. Something about 'years'...
high... as becoming high... uh.... maybe 'if you are older' or something like that.....

In this protocol, he recognised the first character 年 means 'year' and constructed the hypothesis that the target word might be related to 'year'. Furthermore, although he did not verbalise it, the retrospective interview revealed that he also noticed the second character 齡 having a 齒 (tooth) as its part. Then, he hypothesised that the target word might mean 'elderly person' or that sort of word. Next, he read the part immediately after the target word and understood it as 'as (something) is becoming high.' Combining the two clues, one from the target word itself and the other from the immediate context, Ed finally concluded that the word meant 'age' and understood the whole phrase as 'as one is becoming older'. As Eric did, Ed used the two types of clues, one is kanji characters themselves and the other is the context. Ed inferred correctly two out of seven unknown kanji words in this way.

These strategic steps used by Ed and Eric are identical to those used by the subjects in Huckin and Bloch's study (1993). Their subjects first attended to the word-form and studied it if they recognised any of its parts. If they did, they generated the hypothesis about the meaning of the target word. Then, they evaluate their hypothesis using one or more context clues. Similarly, Ed and Eric first attended to the kanji characters to see if

they would recognise any of them. If they did, they generated a hypothesis using the meaning of the identified character(s) or using it in conjunction with the context. Finally they evaluated it with reference to either a local or global context, or sometimes both.

Elaine and Eleanor, on the other hand, did not use the steps that Ed and Eric did. Despite their attempt to guess what the target word might mean, they failed to do so in most cases. Even if they did generate a guess, they found that it did not fit in with the rest of the context. Eventually, they discarded the guess and either made a "pothole," that is, they avoided the words that they did not understand when reading the sentence, or skipped the whole sentence completely. For instance, Elaine also did not know the word 年齢 in sentence 4. What she did was to skip the whole sentence. Her protocol of this section reads as follows:

Two kanji I don't know that starting at the sentence. uh... *high... as becoming...* uh... OK. hmmm..... *as becoming.....* don't I forget what '*hodo*' is. hmmm..... OK. *patience....*OK. Yeah, I'm not sure what the first kanji really is. So, it's hard to translate it. [She moved to the next sentence.]

In this protocol, Elaine seems not to know what to do when she did not understand the target word. It appears that she continued to read the rest of the sentence to see if it would provide her with any clues on the meaning of the target word. However, this did not work. Also, she verbalised that she forgot what the function word "*hodo*" means. As a result, she skipped the whole sentence and moved to the next.

For another example, Eleanor did not recognise the word 行列 (line-up) in sentence 9. Her protocol shows that she recognised neither of the characters in the compound.

She verbalised as follows:

...I think the first kanji is *yuumei*, 'famous'. *Yuumeina mise* would be like uh 'famous stores'? Maybe. And restaurants uh... this is saying that in front of res....

like uh, restaurants or famous stores... uh... that the wait is often... or people feel that they can wait much longer. I'm not sure what the kanji is after "long", but I imagine that this is what they are saying.

Here, Eleanor simply skipped the word 行列 (line-up) and tried to reconstruct the sentence from the segments that she could understand. Obviously, she used the mental presentation of the text that she had obtained up to this point: this passage is talking about "waiting and irritation." Therefore, her interpretation of the sentence does make sense to some degree in the discourse. Yet, it was quite different from what the sentence meant to be.

Why Ed and Eric could use the context clues effectively and why Elaine and Eleanor could not may be related to the fact that the latter two belong to the lower proficiency level. The TA protocols of the four readers show that Ed and Eric know much more kanji words than Elaine and Eleanor in both passages. The previous studies in ESL context suggest that the most common and effective strategy for guessing words' meanings is to find the keywords in the immediate/local context that collocate with the target word syntactically or semantically (Haynes 1984; Huckin and Bloch, 1993). However, many of content words are written in kanji in Japanese texts. Therefore, not being able to recognise too many kanji words (i.e., bottom-up processing) would prevent the readers from using this keyword method (i.e., top-down processing). In other words, the reader must be able to use bottom-up processing at the 'threshold' level to activate the top-down processing. In this study, the deficiency in understanding the kanji words (i.e., the bottom-up processing) might prevent Elaine and Eleanor from using the context clues (i.e., top-down processing) to guess the meaning of those words.

Compared to the NSE readers, the NSC readers had many fewer problems with understanding or guessing the meaning of kanji words. The relatively consistent performances in comprehending both passages suggest that transferring the vocabulary knowledge from Chinese to Japanese helped the NSC readers a great deal. Nevertheless, their TA protocols show that their knowledge of Chinese language also may become a drawback. In this study, there were four cases in which the reader's Chinese knowledge appeared to have caused failures in understanding or guessing the meaning of kanji words. One such case involved the character 声 (voice) in Passage 1. In the Chinese language, this character can also indicate three things: 'sound', 'voice', and 'noise'. However, in Japanese, the character only means 'voice', and the other two 'sound' and 'noise' are expressed by completely different words. In other words, the semantic usage of the character is much narrower in Japanese than in Chinese. All the NSC readers but one understood the word as 'voice' and only Christy gave the correct translation in Japanese. Another case was observed in Passage 2. In sentence 1, there is a word 新聞 that means 'newspaper' in Japanese. This word, however, means 'press' or 'news' in Chinese. Although most NSC readers translate this word from Japanese into English as "newspaper," Colleen understood it as "news," which obviously resulted from the application of her Chinese knowledge. Interestingly, the NSC readers seem not to have noticed that they misunderstood the meanings of these words; in fact, they claimed that they knew these words. The TA protocols also suggest that the readers unconsciously applied the Chinese knowledge in understanding the kanji words. They did not express any hesitation or doubt as to about what they had interpreted. In the passages used in this

study, these words were not critical to the overall comprehension of the text. However, if these 'false cognates' were the keywords to understanding the passage, their Chinese knowledge could activate the wrong content schema and, consequently, the readers might interpret the text differently from what it should be. Haynes (1984) reported a case in which the use of faulty cognates misled the Spanish readers in reading English texts on what the story was about.

In addition, there was also a case in which the heavy reliance on Chinese language led a NSC reader to a wrong inference of the unknown kanji word. In sentence 3 of Passage 2, Carmen did not know the word 二十代 in sentence 3. In Japanese, the word means 'in one's twenties'. In contrast, the character 代 means 'a generation', 'a dynasty', or 'a geological era' in Chinese. Carmen understood the word 二十代 as "20s" in her written recall. In the retrospective interview, she told the researcher how she guessed the word's meaning:

Because I... first because I... my native language is Chinese. So, the kanji of Japanese is quite similar to Chinese. So, I was trying to connect these two things [i.e., the word's meaning in Japanese and that in Chinese] together and guess the meaning. So, here, 代I think it is a kind of 'that period' [in Chinese]. So, I think the same principle can apply to Japanese. So, I think it.... mean 'twenty century' or that kind of thing.

Here, Carmen understood the unknown kanji character in Chinese. Then she used the meaning without checking its appropriateness with other clues, such as the context.

Consequently, she misinterpreted the whole sentence. As she expressed in the interview, Carmen appears to have a strong belief that Japanese kanji can be understood in Chinese. Yet, this belief might inhibit her from using other clues, such as the context, that were available to her. The interpretation of the sentence, the female of 20s (i.e., the twentieth

century), is somehow incompatible with the content of the previous paragraph since it implies that the focus of the study was only on the relationship between the length of waiting time and irritation among people in the modern Japanese society.

These three examples of misinterpretations of kanji words by the NSC readers appear to support the implications in Takebe (1979; 1989) and Chou (1991); the over-generalisation of the semantic compatibility between Japanese and Chinese may lead the Chinese native readers to incorrect judgement of the meaning of kanji words. In some cases, the NSC readers noticed the meaning in Chinese did not fit the context that they had read. For instance, Colleen told the researcher that she first tried to understand the word 二十代 in Chinese. However, she discarded that interpretation because it did not make sense in the context. This type of the sensitivity to the other clues may be needed to prevent the over-reliance of their Chinese knowledge.

In summary, this section examined the difference in strategy use between the two language groups. The quantitative data shows that the NSE readers used two strategies, Translation in Passage 1 and Questioning the Meaning of a Word or Sentence in Passage 2, more frequently than the NSC readers. However, there was no one type of strategy that distinguished one language group from the other in both passages. The examination of the qualitative data in Passage 1 implies that frequent use of the Translation strategy by the NSE readers might be resulted from the combination of the unfamiliarity of the passage content and the existence of too many unknown kanji words. However, in Passage 2, although the NSE readers questioned the meanings of words, phrases, and sentences more often than the NSC group, the degree of using Translation strategy by the

NSE readers was varied from one reader to another: Eric used translation strategy more often in Passage 2, and Elaine and Ed did in Passage 1. Therefore, it seems that the strategy use among the readers in this study may be influenced not only by their language backgrounds but also other factors such as individual differences.

Furthermore, the comparison of the word solving strategies for kanji words between the two groups confirmed that the NSC readers inevitably applied their knowledge of vocabulary and characters in Chinese to understand unknown kanji words. However, this positive transfer of the knowledge sometimes may also become a negative transfer; the kanji words of which meanings are, partially or completely, incompatible with the same combinations of characters in Chinese may cause the faulty interpretation of the text meaning if the reader does not use any other sources as cross reference. On the other hand, the NSE readers used various types of word solving strategies. Particularly, they sought the clues in the morphological analysis, that is, using the familiar kanji in the target words. However, this analysis may not be very useful if the readers do not use the other sources of clues, especially the context clue. In addition, the results suggested that there is a threshold level of vocabulary and kanji knowledge required in order to use the context clues effectively.

Strategy Use: Effective Readers versus Less Effective Readers

The third and last research question of this study was if there are any characteristics of the strategy use that discriminate the effective readers from the less effective readers within each language group. In this section, first the overall results concerning the

relationship between the strategy use and recall scores are considered. Then, qualitative data will be presented and discussed regarding the process of successful and less successful comprehension. Also, this section will discuss similarities between the reading processes of the effective readers in the two language groups.

Relationship between the Strategy Use and Recall Scores

As presented in the previous chapter, the Spearman's r_s between the type of the strategies and scores of written recall show that Questioning the Meaning of a Word or Sentence was strongly correlated with the participant recall scores in Passage 1 in a negative direction. This suggests that, the better the participants understand the meaning of a linguistic unit, such as a word, phrase, and sentence, the more the participants could recall the content of the passage. However, there was no strong correlation between the participants' strategy use and recall scores in Passage 2.

The comparison of the recall scores shows that all the readers who score highly in Passage 1 were the NSC readers, who have an advantage of understanding kanji words. Furthermore, the TA protocols of the low-scoring participants demonstrate the overwhelming struggle of those readers to understand unknown words, although there is one exceptional case. These findings suggest that understanding or inferring the words' meaning might be one of the crucial factors for successful comprehension in Passage 1. This result is congruent with those in the previous studies of L2 reading in non-JSL contexts (e.g., Davis & Bistodeau 1993; Grabe 1991, Koda, 1994; Ulijn, 1981; Swaffar,

Arens, & Bynes, 1991), that is the readers' vocabulary knowledge in the target language is one of the important factors in comprehending texts in L2.

However, the effect of the vocabulary knowledge on recall scores appears less obvious in Passage 2. The results of the Spearman's r_s did not show any strong correlation between the recall scores and vocabulary related strategies, such as Questioning the Meanings of a Word or Sentence. In addition, one NSE reader, Eric, could recall a fairly large amount of the content although the rest of the high-scoring participants were NSC readers. Moreover, another NSE reader, Ed, performed much more poorly than Eric although the former had fewer unknown words. These results seem to suggest that something other than the readers' vocabulary knowledge affected their performance in the recall of the passage. In the following sections, the comprehension processes of both groups will be examined to investigate if there are any similarities among the effective readers in the two language groups.

Comprehension Processes among the NSC Readers

As discussed in the previous section, all NSC readers, except one, could recall fairly large proportions of the total number of propositions in both passages. Carmen, however, recalled a much lower proportion of propositions than her peers in both passages. In the Japanese proficiency test, Carmen achieved the second highest scores of all the participants in this study. This implies that a lack of linguistic knowledge in Japanese was not the cause of her lower recall rate of the content of the passages.

One of the factors differentiating Carmen from the other NSC readers is that she tended to spend very little time inferring the meaning of words, phrases, or sentences that she did not understand. The comparison of the raw frequency of the Skipping strategy shows that Carmen skipped words, phrases and sentences more frequently than other NSC readers. When she found words, phrases, or sentences that she did not understand, she just skipped them and moved on to the next part. For instance, in Passage 1, she did not understand the meaning of sentence 15. Carmen's TA protocol read as follows:

[Reading sentence 15 and 16 in Japanese] I don't understand the first sentence [reading aloud sentence 15] That sentence. I cannot figure it out. But, the second one [sentence 16] is.....

Sentence 15 seems to be the most difficult sentence to understand even for NSC readers.

One of the words, 工夫 (devising), has a completely different meaning in Chinese (labour). Furthermore, there was another unknown word, 思いつく (to come across), is something that the reader cannot guess the meaning by simply applying the Chinese knowledge since the word is a combination of a kanji stem and hiragana auxiliary verbs. Nevertheless, three other NSC readers did try to interpret the text using various strategies; such as using either Chinese knowledge, the global context, or the topic or general knowledge. When none of these word-solving strategies seemed to work, the other NSC readers tried to understand the sentence as it would fit into the text representation they had constructed in their memory. In contrast, Carmen did not make any attempt to infer the meaning of the sentence at all, moved on to the next sentence, sentence 16. She merely verbalised her problems in understanding the sentence and, without verbalising any

plan or strategy to solve those problems. This pattern was also observed in her reading of Passage 2.

Also, Carmen seldom checked her interpretation of the passage, using other sources such as coherence, between what she had read and what she was reading. For instance, Carmen misinterpreted sentence 13. This sentence states the consequence of sentence 12; since the long line-ups in front of the shops attract people passing by, some shops recently began to hire part-time workers to stand in lines in front of their shops. However, Carmen did not understand the relation between sentence 12 and sentence 13; she interpreted sentence 13 as "recently... some people would line up for... in front of some shop for... to find a part-time job." In a retrospective interview, she said that she had a problem connecting the meaning of the word, 頼む (to request; to hire), to the other part of the sentence because she knew the word only as 'to request'. However, she noticed that there was the word アルバイト (part-time work/worker). Apparently, this word activated her general knowledge. She finally concluded that people 'request the part-time job from the store'. However, she did not recognise that this interpretation did not fit with what the previous parts said. She also made similar mistakes in reading Passage 1.

As this example demonstrates, Carmen's reading processes appear to be sentence-based. If she could make sense at the intra-sentential level, she moved on to the next sentence without evaluating it in the global context of the text. On the other hand, the other NSC readers seemed to pay more attention not only to intra-sentential but also inter-sentential coherence/cohesion. Cathy, for example, interpreted sentence 13 accurately

although she spent more time trying to understand the sentence than Carmen did. Cathy's

TA protocol of this sentence is as follows:

[After reading the whole sentence aloud once] *Therefore....* so, 'therefore' something like that, *recently... 'recently'... recently... hmmm.....* the line-up... *part-time job of....* oh, "*arubaito*" is 'part-time job'. *to request... "tanomu"* is trying to... to describe the shop.... *it is said...* it seems that there is also shops that hire... this is not really means 'to ask for favour' or this mean 'hire' part-time people to line up because of this [previous part].

Here, Cathy verbalised more language decoding strategies, such as analysing sentence structure and verbatim translation. This suggests that Carmen was much automated at using the language decoding processing than Cathy was. In fact, Cathy's score in Japanese proficiency test was lower than that of Carmen. However, Cathy used the various sources to understand the sentence. First, she knew the word 頼む as 'to ask for favour'. Her protocol suggests that she probably noticed that the meaning of the word that she knew did not fit well in the context that she had understood. Also, she knew that the previous section up to 頼む was modifying the following noun 'shops'. Furthermore, Cathy seems to have noticed that the causal relationship between sentence 12 and sentence 13. Using these clues, she changed the interpretation of the word slightly in a way that the sentence would be suited with the context better. This result suggests that the readers' metacognitive ability, in this case, evaluating their interpretations using various types of sources, has an effect on successful comprehension.

Interestingly, Carmen could not recall the latter part of both passages. Both passages were written in the rhetorical structure called *ki-shoo-ten-ketsu*, which is the most common for Japanese expository prose (Hinds, 1983; Thomas, 1988). In these two passages, each paragraph corresponded to the four parts of the rhetorical structures (see

Chapter 3 for further explanations of the rhetorical structure of these passages). Also, in the passages, the author made a contrast between the second and third paragraph, which correspond to the *ten* section (i.e., turn to the sub-theme). In Passage 1, Carmen did not have any problems in understanding the first two paragraphs. However, she showed confusion and difficulty in understanding the last two paragraphs. In the retrospective interview, Carmen perceived that the last two paragraphs were the most difficult to understand and explained the reasons as follows:

Because there are so many things I don't understand. But, I understand the words, but when I put them together, I don't understand. So, I think I felt depressed because.... "Why I cannot understand?"

Apparently, she did not have a problem of word recognition, but failed to reconstruct the meaning from those words. On the contrary, in Passage 2, Carmen did not perceive such frustration. She perceived the passage as fairly easy to understand. Yet, both her TA protocols and written recalls show that she misunderstood the content in the third paragraph.

One of the clues to identify why Carmen made such misinterpretations might be that she appeared not to have recognised the third paragraph contrasting with the content of the second paragraph. In both passages, there was a connective *でも* (but; however), which clearly expresses the contrastive nature of the paragraph. However, Carmen seemed not to have paid much attention to this conjunction in her reading. She neither verbalised the word in her TA protocol nor wrote in her written recall for Passage 1. As for Passage 2, Carmen did include the word "however" at the place corresponding to the beginning of the paragraph three. This suggests that she noticed this word in reading

Passage 2 but did not verbalise it. Nevertheless, her TA protocol for Passage 2 implies that Carmen was still not clear what the third paragraph meant in relation to the rest of the passage when she understood the text as a whole. In reading the last sentence of Passage 2, she had a trouble in understanding the meaning of the sentence. It is very short, but the author is expressing what he/she wanted to the most throughout this passage; the author is indirectly criticising the fact that, despite being less patient to wait for their friends, people are willing to take trouble to wait for a long time to enter famous restaurants or shops. The author expresses this by saying, "Why does it happen?" Carmen did not understand how this short sentence would connect to the rest of the part and did not write anything in her written recall on the last paragraph.

The other three NSC readers, on the other hand, seem to have noticed the global text organisation of Passage 2. They either explicitly stated their recognition of the text organisation or, even if they did not verbalise it, they used the same text organisation as the original passage in their written recalls. This suggests that being unable to identify the rhetorical organisation of the passage caused Carmen to fail comprehending and recalling the content of the passages.

Comprehension Process among the NSE Readers

The scores of the Japanese proficiency test show that the NSE group is composed of two proficiency levels: the intermediate and the slightly lower than intermediate level. Nonetheless, the recall scores of Passage 1 were almost the same among the four readers, except Elaine. As discussed in the second sections of this chapter, this is likely to result of

the combination of too many unknown kanji words and unfamiliarity with the content area.

In Passage 2, the lower proficient participants, Elaine and Eleanor, also could not recall much of the content in the passage (10.9 and 18.2 percent, respectively). Their TA protocols clearly show that their limited vocabulary and kanji knowledge again inhibited their comprehension when reading Passage 2. They often verbalised the vocabulary, particularly the kanji words, as unknown and failed to infer the meaning of those words. Also, Elaine and Eleanor tried to understand the passage by connecting the segments that they understood and, at the same time, by applying general or world knowledge. However, this did not work very well since the information obtained from the text was so limited that they could not reconstruct what the author actually stated in the passage. Eleanor, for example, recognised the limitation of this approach and verbalised the possibility of misinterpretation as "Maybe I made a whole new story." These two readers' reading processes clearly support the claims in a non-JSL context that the language decoding ability has an important role in L2 reading (Carrell, 1991; Clarke, 1980; Cziko, 1980; Devine 1987).

Also, in Passage 2, two noticeable patterns were observed. First, despite the highest scores in the Japanese proficiency test among the NSE readers, Ed performed poorly in comprehending the passage. Second, Eric's recall score was six times as much as that in Passage 1.

Comparison of the reading time shows that Ed spent the less time than Eric did (13.2 minutes and 18.8 minutes, respectively). This difference seems to be mainly because Eric

had more problems in understanding the vocabulary in the passage. Ed did not know ten of the words, while Eric did not know fifteen of them. Therefore, Eric needed to spend more time to solve problems caused by those unknown words. Also, Eric mis-identified the first kanji character in the title, 待 (to wait) as 持 (to hold in hand; to have). This mis-identification had his reading processes slow down since he seemed to struggle, at several places, to fit the meaning of the word 待つ (to wait) in the local context. Combining these facts, it is implied that Ed is more advanced user of the lower processing strategies, such as kanji recognition and word recognition.

One of the differences between Ed and Eric in the TA protocols of Passage 2 was that the former expressed difficulty in making a connection between the first two paragraphs and the last two. While reading the passage, Ed frequently questioned himself why the author included certain statements. Particularly, when reading the whole passage for the second time, he kept on asking himself "why":

... many people are waiting in lines... it's becoming more popular for people to wait in lines in front of things like uh..... a cheap store or a restaurant that gives you good food. uh.... But why is this strange?... like uh... maybe it's strange because they are willing to wait so long. uh... uh.. and also these days uh... people are waiting... you can see people waiting in lines to get a job. uh... but... I don't understand why this is strange. uh... OK. Waiting for your friend or your... your girlfriend or lovers or something like that.. uh... if you wait like... because if you wait for twenty minutes.... I think that's 'because' or 'although', although you wait twenty minutes... uh... you have to be patient to get into the famous store or... hmmm.... What does this have to do between waiting for your friend and getting into store?

This segment shows that Ed did not have problems in understanding the 'language' but did struggle to fit the third and fourth paragraph in the broader context. Later in the interview, Ed told the researcher that he did not understand why the author started to talk about the long waiting line in front of shops in the third paragraph and also the main

meaning of the question, "Why is that so?" at the end of the paragraph. Apparently, Ed, like Carmen, did not recognise that the second and the third paragraph were contrastive with each other. This suggests that not being able to determine the coherence among the parts of the text might inhibit Ed from constructing a sound text representation in his memory and, consequently, he could remember only segments of the latter paragraphs in his written recall.

Interestingly, Ed was the only reader who knew the rhetorical structure *ki-shoo-ten-ketsu*. In the retrospective interview of Passage 1, Ed suggested that he used the knowledge of the *ki-shoo-ten-ketsu* to determine that the third paragraph was contrastive. However, Ed seemed not to recognise that Passage 2 was written using the same rhetorical organisation. Furthermore, Ed misunderstood the connection between sentence 8, "But, this result of the survey is a little strange," and the rest of the sentence in the same paragraph. In his TA protocol, he translated sentence 8 correctly. However, he did not understand why the author made this statement. Finally, he misunderstood that the author was considering the following parts, such as the making of a line in front of shops, as a strange phenomenon. This misunderstanding caused further confusion to Ed since it conflicted with his previously obtained knowledge that people tend to be patient while waiting to enter good restaurants or famous shops. Without being able to solve this conflict between the information obtained from the text and his previously obtained knowledge, Ed kept on wondering, "Why is the author saying this?"

Moreover, this segment showed that use of the general knowledge distorted Ed's interpretation of sentence 13. His TA protocol and retrospective interview confirmed that

Ed knew all vocabulary in the sentence. However, the TA protocol for this sentence is read:

Recently... or, there's also... uh... people are lining up to... to find jobs? I guess... uh... uh.. employment line or something like that. OK. What does this have to do with getting irritated?

After interpreting the sentence, Ed appeared to notice that his interpretation did not fit to the theme of this passage, waiting and irritation. Nevertheless, he did not revise the interpretation. It seems that the words, 'part-time job' and 'line-up', was connected to the 'employment line' in his general knowledge. Since this perfectly made sense, Ed did not think that his interpretation might be wrong. He even did not try to fit the sentence into the broader context. In other words, the information obtained from the text itself through the bottom-up processing has been overridden by the reality stored in the reader's general knowledge that is activated by top-down processing.

On the other hand, Eric's reading process is quite different from Ed's. First, Eric seems to be more sensitive to the text organisation. In reading both passages, Eric frequently attended to the connectives. For instance, his TA protocol shows that he anticipated, by attending to the connective *でも* (but), that the third paragraph was going to be contrasting with the previous paragraph.

Moreover, Eric also understood sentence 13 accurately by using the information obtained from language decoding and information that he had obtained in reading previous parts of the text. Unlike Ed, Eric did not know the meaning of the word, *頼む* (to request; to hire) in this sentence. Despite this disadvantage of vocabulary, Eric successfully comprehended the sentence. His TA protocol of this sentence is as follows:

Therefore.... uh... recently... So, that would be... 'because of this'... uh... 'recently'... uh.... line part-time job of... 'arubaito' means 'part-time job'... ko... uh... Is that 'kooretsu'? part-time job of.... something.. I don't know what the verb is... It's gonna... I don't know what the kanji for the word.... uh... I heard that there are shops.... So, it seems like uh... recently... presently.... uh... part-time... line-up..... I heard that there are.... hmmm.... I'm not sure what that means. Is that 'kooritsu' or 'koo' something.... line-up of part-time job.... part-time... shops.... Oh, maybe, some stores are offering people... people for money that stand up in the lines... from other stores draw attention to the store. Anyway, if that's what it means, it will make a little sense.

In this segment, Eric also attended the connective *それで* (therefore), and seemed to interpret the relation between the target sentence and previous sentence as " Because of sentence 12 (i.e., if many people make a line in front of the stores, people passing by tend to think that the stores are low in price or selling good quality of goods), the event in sentence 13 (i.e., the stores hire part-time workers and had them make a line in front of their stores) happened." This interpretation was confirmed in his retrospective interview. He told the researcher that the major clues to interpret sentence 13 was the causal relation between sentence 12 and 13, which was indicated by the word *それで* (therefore), and the words 'part-time job' and 'lines' in the target sentence. In other words, Eric used the bottom-up, (word recognition), and the top-down (using the causal relationship between the two sentences) spontaneously to successfully comprehend the paragraph. Compared to Ed, he checked his interpretation in the context of the last part of the exert above.

Moreover, the written recalls of these two readers show a difference, too. Ed's recall protocols suggest that he could recall even very small details of the first two paragraphs in the passages. However, he barely remembered what was written in the last two paragraphs. Even though he could recall some parts of them, each segment was logically disconnected. Also, despite the instructions to write what he remembered from

the passage, Ed also wrote his opinions about the content of the passages or his feelings in reading the passages. For instance, in his written recall of Passage 1, he wrote:

This article mentioned mathematics. I am confused though. Can young children learn math via these toys?

The last sentence of this segment obviously expresses Ed's opinion about what the author said in the passage. A similar segment was found in his recall for Passage 2:

According to the article, the results of the survey seem to be a bit strange. I found it difficult to understand the reasoning behind this statement as the paragraph developed.

In this segment, Ed expressed his confusion when trying to understand the third paragraph. Again, the last sentence of this segment is not expressing what he understood, but his feeling. On the other hand, Eric's written recalls do not include these kinds of statements. Eric wrote down only what he remembered what the author said in the passage, using the rhetorical structures that are exactly the same as in the original passages.

This difference between Ed and Eric in their written recall somehow reminds one of the differences between the effective readers and less effective readers in Block's study (1986). She found that, in their TA protocols, the less effective readers tended to use the reflective mode of response, in which the readers directed their attention to their own thoughts and feelings rather than to the information in the text. The readers who used the reflective mode tended not to integrate information either. The effective readers, in contrast, responded in the extensive mode; they focus on understanding the ideas of the author expressed in the text and made a connection between the information in the text. Although Ed did not explicitly verbalise the use of reflective mode in his TA protocol, it

seems that he experienced the similar struggle while reading the passages. It seems that Ed could not find a way to eliminate the contradiction between what he read and what he knew about the topic. As a result, he misinterpreted the sentence completely.

Discussion

The examination of the reading processes between those who had higher recall scores and those who did not suggests that there is some similarity regardless of the readers' language background.

First, the recall score results suggest that the reader's proficiency level in Japanese may have only a limited effect on comprehending and recalling the content of the passages. The less proficient readers, Elaine and Eleanor, performed poorly in comprehending and recalling both passages. Their TA protocols clearly show that this was mainly due to the lack of the vocabulary and kanji knowledge. However, Ed and Carmen, who scored the second and the third highest scores in language proficiency test, also performed much more poorly than Eric and Cathy, who marked the lower scores in the same test. The TA protocols and retrospective interview implies that the readers' ability to understand the language system was not the cause of the difference. Ed and Carmen's reading processes show more smooth language processing than Eric and Cathy's, whose processes appear to depend more on the bottom-up, text-based processing.

One of the causes seems to be that the two less effective readers appeared not to recognise the global text organisation. They seemed not to be aware of the relationship between the paragraphs and sentences. Even if they did, they could not use the

organisation to generate the text representation in their memory for later retrieval.

Consequently, they failed to recall part of the content. On the other hand, all the readers who recalled higher percentage of the propositions not only recognised the global rhetorical structures but also used the same rhetorical organisation in their recall.

This result seems to support the finding by Carrell (1992); the readers who were not aware of text organisation of the original passage but also who only used the organisation in their written recalls showed superiority on the recall task, both quantitatively and qualitatively, than those who did not. In this study, both Ed and Carmen did not use the original text structures in their recall. They could remember, rather in details, the content of first two paragraphs and they used the same rhetorical organisation in their written recalls. However, Ed and Carmen were unable to recognise or identify the logical relation between the first two paragraphs and the last two. As a result, they could not recall most of the last two paragraphs. Even if they could recall, it was rather segmented and each segment was presented independently. As Carrell found, the awareness alone does not seem to be enough. Ed was aware of the rhetorical organisation in Passage 1. In addition, he knew the rhetorical structure *ki-shoo-ten-ketsu*, which is typical in Japanese expository texts. Nevertheless, he failed to use the structure in his recall. This result implies that knowing or being aware of the rhetorical organisation may not be enough for successful retrieval of the content; the readers have to be able to use the structure to generate the text representation in their memory. In other words, the readers' ability to use their rhetorical knowledge in the process of reading may have an important role for successful comprehension and recall of the content.

Moreover, the less effective readers in this study appeared not to evaluate their comprehension using the broader context. Both readers seemed to understand each sentence independently; they hardly made a connection between the information nor checked the interpretation with other parts of the passages. Also, these readers seemed not to know what to do when they noticed the problems. In the case of Carmen, she noticed that some phrases and sentences caused the problems in understanding Passage 1. However, she did not try to solve the problems and simply skipped those phrases or sentences. Ed, on the contrary, had the problem to understand the author's idea in the passages. However, he appeared not to have known how to overcome this problem and, in the middle of confusion, he was just wondering "why is he saying this." These patterns are also observed by Block (1986) among the readers whom she called "Nonintegrators." In a later article (1992), Block reported that these readers used the monitoring strategy rather incompletely; they failed to identify the source of the problems or, even they did, they did not make strategic plans to solve these problems. On the other hand, the effective readers in this study seemed to pay more attention to the coherence in the passages and frequently checked their understanding with reference to the broader context. Also, those effective readers appeared to know how to solve the problems when they faced them. Their TA protocols show that they possess great control over their attention, adjusting the reading pace to prevent their memory becoming overloaded, and constantly checking their understanding throughout the reading processes and revising it if necessary. This result again seems to support the previous findings in non-JSL contexts, that the reader's

metacognitive ability plays an important role in reading comprehension (Anderson, 1991; Barnett, 1988; Block, 1986, 1992; Casanave, 1988).

CHAPTER 6

Conclusions and Implications

In this chapter, the conclusions of this study will be presented. Also, the limitations of this study will be discussed in terms of the generalisability of the results to the larger population. Finally, the implications of this study to the JSL classrooms and suggestions for further research will be discussed.

Conclusions

The primary purpose of this study was to investigate the reading processes of two groups of JSL readers whose first languages were English and Chinese. The results of this study showed that the reading processes of the participants were similar to those that have been identified in previous studies in non-JSL contexts, except for one strategy; the participants in this study frequently used verbatim translation. One of the possibilities regarding what caused this difference was the way the study was designed: the use of English to report their thought processes may encourage the participants to translate what they read in Japanese into English. Also, the use of English as a medium language in their classrooms might increase the use of the translation from Japanese into English. Nevertheless, there is also the possibility that other factors might be involved in this result, such as the readers' proficiency level in the target language (Carey, 1991). Therefore, further investigation is necessary to determine the cause of the frequent use of verbatim translation in this study.

This study also attempted to examine the validity of the prevalent belief among JSL teachers that Chinese readers have an absolute advantage of reading Japanese text over the English native readers. The results of this study suggest that being literate in Chinese language does help JSL readers comprehend Japanese texts; in particular, if the content of the text is unfamiliar to the readers. In this study, all the NSE readers showed difficulty in understanding the content of Passage 1. The data clearly suggests the Chinese readers did use their knowledge of vocabulary and characters in Chinese language as a major source to solve kanji vocabulary problems. In addition, they showed relatively consistent performance in the recall task regardless of the content or difficulty level of the passages. In contrast, all the English readers in this study did struggle to understand the kanji words. In order to overcome the word problems, they used wide variety of word inference strategies, particularly word-form based strategies such as using the kanji in the target word as clues. However, in Passage 1, a vast number of unfamiliar kanji inhibited the NSE readers from using other sources to infer the meanings of those kanji words. These results suggest that knowing the Chinese language is truly a great help for the readers.

However, this advantage of Chinese readers in comprehending Japanese texts may not be an absolute one. This study found that, since the visual familiarity of the characters spontaneously activates the readers' Chinese knowledge, they sometimes unconsciously understand the meanings of the words as they are in Chinese. It may not be a problem in most cases. Nevertheless, if a combination of the characters is not semantically compatible in the two languages, the Chinese readers may interpret the passage quite

differently. In particular, if the word is expressing the key concept necessary to understand the content of a passage, then it can be a very serious problem. In this sense, the Chinese knowledge is also, as Chou (1991) stated, a 'double-edged sword' for Chinese readers; it has both an advantage and disadvantage in comprehending Japanese texts. In this study, there were four cases where the readers misunderstood the meanings of kanji words because they relied on their Chinese knowledge as a source. This suggests the importance of knowing the possible risks to apply the Chinese knowledge and cultivating the sensitivity to the semantic similarity and difference of kanji words between Japanese and Chinese. In addition, one of the four cases was also related to that the reader ignored the fitness of her interpretation of the word's meaning into the broader context. This implies the significance of the readers' ability of using context clues as the source to evaluate the appropriateness of the interpretation in the specific context.

Moreover, the comparison of the recall scores implies that the use of the Chinese knowledge does not necessarily guarantee the reader the successful comprehension of the Japanese texts. The poor performance of Carmen in the recall tasks for both passages and the relatively high recall scores of Eric in Passage 2 imply that something more than the transfer of the knowledge of vocabulary and characters in Chinese may be crucial for successful comprehension.

The qualitative data of the effective readers and less effective readers suggest that what discriminates the former from the latter may be the way in which they read the passages. In this study, the less effective readers, one Chinese and one English reader, failed to recognise the global text structure. Even if they did recognise, they did not use

the structure to establish the connection among the sentences or paragraphs in the passages. On the other hand, the effective readers not only were aware of the text structure but also used the original structure in their recalls. Therefore, it appears that the readers' ability to use the rhetorical structures of the original passage to connect the parts of the text may be one of the important factors in order to understand and recall the passages successfully. This seems to confirm the great impact of the rhetorical structures on reading comprehension (Carrell 1984, 1987).

Also, as previous L2 studies had identified, the readers' metacognitive abilities appear to be crucial for successful comprehension. The less effective readers tended to evaluate their interpretation of the sentence only at the intra-sentential level and not to pay much attention to the coherence among the sentences; they appeared to accept their interpretation as correct if they could make sense at the intra-sentential level. In some cases, the less effective readers heavily relied on their general knowledge, which were activated by one or two words in the sentence, and interpreted the sentence based only on that source. They did not check if the interpretation would fit in the rest of the passage. In contrast, the effective readers seem to use the context effectively to evaluate their interpretation as well as to assist themselves in inferring the meanings of the sentences or phrases.

Also, the less effective readers appeared not to know what to do when they faced problems. Carmen seldom tried to solve the problems in understanding the words or sentences. She simply skipped the part she did not understand. Ed obviously did not know what to do when he could not understand the author's intention in including

particular content and helplessly repeated "why" to himself. These behaviours imply that these readers may not have identified their problems or that, even if they have identified their problems, they could not form any strategic plan to solve the problems. On the other hand, the effective readers identified their problems clearly and planned what to do to solve those problems. In short, the less effective readers in this study appeared not to employ their metacognition effectively.

Interestingly, both less effective readers, Carmen and Ed, scored relatively high in the Japanese proficiency test. In fact, their scores were higher than those of Eric and Cathy, whose recall scores were much higher than those of Carmen and Ed. On the other hand, the two English readers, Elaine and Eleanor, achieved much lower scores than the other six readers in the Japanese proficiency test and performed poorly in the recall tasks of both passages. The data of their reading process indicates that the large number of unknown kanji words and structures overwhelmed these readers. However, Carmen and Ed also had difficulty to understand the content although they seemed not to have many problems in understanding the language itself. Thus, the readers' proficiency in the target language may not be the single factor to determine their performance in reading comprehension, but does have an effect on the comprehension process. This implication confirms the notion of interactive process in reading comprehension; both bottom-up language decoding and top-down interpretation are crucial for successful comprehension.

These results seem to give some evidence for the findings by Hatasa (1992) and Ishida (1985) that the effect of the knowledge of vocabulary and characters in Chinese have only a limited effect on the reading comprehension of Japanese texts. The data of

this study shows the possibility of a larger impact, of the readers' metacognitive ability and use of rhetorical structure (i.e., higher-level processing), on the comprehension performance than Chinese knowledge itself. In other words, even if the reader can recognise the larger number of kanji words at a much faster speed than English readers, they may not be able to comprehend the text successfully if they cannot use these types of higher-level processing effectively. Of course, this study was preliminary in nature and the number of the participants was small, so that further investigation of this issue must be done in a larger scale study. However, the results of this study may give the JSL teachers some warnings not to over-generalise the advantage of Chinese readers in the reading of Japanese texts.

Limitations of This Study

This study was exploratory in nature. Most of the previous studies using think-aloud protocols, conducted to observe the L2 learners reading processes, have involved only two languages; the first and second languages. However, in this study, Japanese is, strictly speaking, the third language for the Chinese readers. In addition, they verbalised their thoughts in English, their second language. Thus, the research procedures, reading in the third language while verbalising in the second language, might affect the Chinese readers' reading processes as well as what they verbalised.

Also, all the Chinese readers, except one, had learned Japanese only through instruction in English. This learning environment might affect their reading processes in many ways. For instance, there is an evidence that the Chinese readers in this study might

switch between English and Chinese in their thought processes depending on what types of language problems that they encountered. All Chinese readers perceived that they tended to think in English whenever they encountered the grammatical problems. However, they claimed that they spontaneously switched to Chinese when they encounter unknown kanji. Therefore, the results of this study might be applicable to the Chinese JSL readers who are learning Japanese using English as an instructional language, but not to those who received the instruction in Japanese or Chinese.

Moreover, the applicability of the coding system in this study also needs to be evaluated with different subjects and materials. The coding system used in this study was developed from the relevant existing coding systems. However, in the process of the adaptation, the number and types of categories were changed considerably. Further evaluation must be necessary to determine the applicability of this system to other data.

Finally, this study used only eight participants. Thus, replications of this study must be conducted in order to confirm the results of this study.

Implications for JSL Classrooms

This study may provide several implications to general reading instruction in JSL and kanji instruction in conjunction with reading although there are some limitations discussed above.

The results of this study suggest that the current reading instruction in JSL classrooms may need to be re-examined. Traditionally, the JSL reading instruction aimed at increasing learners' knowledge of Japanese through reading Japanese texts, rather than

understanding the content of texts (Ozaki, 1991). As a result, the emphasis of the instruction tends to be on explaining the content of the texts sentence by sentence in easy Japanese or, explanation and practising the usage of vocabulary, sentence structures, and kanji that appear in the texts (Hata, 1989; Ozaki, 1991; Yamamoto, 1989). Hata (1989) called this type of instruction as "reading instruction without reading" and criticised its shortcomings in developing learners' reading proficiency in Japanese. Hata pointed out that the centre of the instruction is teachers' explanation about the content of the text or usage of vocabulary and grammar and that, consequently, the learners do not 'read' anything but listening to the teachers' explanation. Thus, it appears that prevalent reading instruction in JSL contexts focuses only on improving the learners' ability to use bottom-up processing.

In this study, despite their proficiency level in Japanese, two readers, Ed and Carmen, seemed not to be able to comprehend the passages successfully because they could not identify the logical connections among the paragraphs. Both readers appeared either to have overlooked the conjunctions that would present the rhetorical organisation of the passage or, to misunderstand the logical connection that the conjunction indicated.

In addition, this study confirmed that readers' metacognitive abilities, such as use of the context to evaluate the appropriateness of their interpretation, are crucial for successful comprehension. The two less effective readers, Ed and Carmen, tended to evaluate their understanding at the intra-sentential level and did not pay much attention to its fitness to the broader context.

These results suggest that the reading instruction in JSL needs to shift its focus from explaining the details of texts and improving language-decoding skills to developing students' ability of using such skills as identifying the global text organisation of the passage, inferring the unknown parts by using their background knowledge or context clues. In other words, JSL teachers should take the interactive nature of reading (i.e., the interaction between top-down processing and bottom-up processing) into account.

Also, JSL teachers should help students to develop their metacognitive abilities, such as evaluating their understanding by using different sources that are available to them. The literature in the area of reading in first and second languages suggests the positive effect of metacognitive training on comprehension in both first language (Brown, Campione, & Day, 1981; Weinstein, & Mayer, 1986) and second language (Barnett, 1989; Carrell, 1989; Kern, 1989; O'Malley & Chamot, 1990).

In order to achieve this shift of instruction, as Yamamoto (1989) recommended, such activities as reading through a whole passage in a limited length of time to grasp the main ideas of the passage, or identifying the rhetorical structure of the passage and summarising the content using the rhetorical structure should be integrated into the current JSL reading instruction. Also, teachers should help JSL learners to develop their metacognitive ability by providing exercises such as using the context in evaluating what they understand or planning strategic approaches when they faced problems.

Furthermore, this study may have implications for teaching kanji to Chinese and English native readers. For teaching kanji to Chinese readers, teachers should recognise the two-sided nature of applying Chinese knowledge in reading Japanese texts: Not all

kanji words correspond to the same combination of the characters in Chinese. At the same time, teachers should help the Chinese students develop the sensitivity about the similarities and differences of the kanji words between Japanese and Chinese. One of the ways to do so may be to ask students to understand the kanji words in Chinese then compare it with the meanings in Japanese. In this way, the students can understand the differences clearly. Also, teachers should encourage the Chinese students to use other types of clues, such as context, to evaluate their interpretation regardless of whether they used Chinese knowledge or not. As the data of this study showed, application of the Chinese knowledge appears sometimes to occur unconsciously. In addition, as Huckin and Bloch (1993) suggested, using the context to evaluate the inference may be essential in using any types of word inference strategies. Therefore, to sensitise the Chinese readers to the suitability of the word's meaning in Chinese to the context may help them to avoid making a wrong interpretation of the sentence.

The use of context for evaluation is also important for the English readers. The results of this study showed that the most common strategies among the English readers were word-form based strategies, such as using known kanji in the target word to guess the meaning, decomposing each kanji character into smaller elements, or using *okurigana* as a clue to search the word in their memory. However, these strategies may not be reliable without using the context to evaluate the appropriateness of the outcome in it. Therefore, the JSL teachers should emphasise the use of the context with the word inference strategies regardless of the readers' language background.

For English native readers, teachers should help them increase the number of kanji in the recognition level. This study identified that even the English readers use the previously obtained kanji knowledge as a major source of guessing unknown kanji words. Thus, the larger the size of the readers' kanji knowledge, the more clues for guessing kanji words will be available to the readers. Also, the data of the English readers in this study showed that they may need to recognise a certain proportion of the kanji characters in the passages in order to utilise higher-level strategies, such as using the context clues. Furthermore, although they knew the words themselves, Ed and Eric did not recognise a few words in the passages because they were not exposed to the kanji characters. This result suggests that the English readers may have a benefit from being exposed to the kanji characters for the words that are frequently used in their learning materials. One possible way to do so is to use the kanji characters for commonly used words in all the written materials that the students will read. Although a consideration will be required regarding how many characters should be introduced to the students at one time, in this way the teachers may be able to help them become familiar with those characters.

Also, teachers should help English readers develop their sensitivity to physical differences and similarities among the kanji characters. In this study, the two English readers mis-identified one character 待 (to wait) with 持 (to have; to hold) in Passage 2. The word "to wait" was involved in the main idea of the passages. As a result, they activated the wrong content scheme, something related to "having time" instead of "waiting time" and were struggling to make connections between the word and the rest of the passage. Lee (1993) also observed similar mistakes and suggested the importance of

developing learners' ability to discriminate one character from those visually resembling it. Thus, teachers should clarify for the students the differences of the kanji characters, that may cause visual confusion, by decomposing those characters to the basic elements and clearly pointing out the same and different elements of the characters.

Suggestions for Future Research

A most important direction for further research will be the replication and modification of this study. The previous studies in a JSL context appear to be predominantly focused on the English speaking (or at least non Chinese-character background) students or Chinese students who are studying in Japan or their home countries. However, with an increase of the immigrants from Asia Pacific nations, the number of those who have already obtained substantial knowledge of Chinese characters seems to be growing among the JSL learners in North American universities. In this context, research regarding such readers is necessary in order to provide the JSL teachers with useful information to understand their reading processes.

Another adaptation of this study may be replications with different types of reading materials, such as narratives. The passages used in this study were written in expository prose. Horiba (1990) conducted a think-aloud study using narratives. As she predicted from previous studies in non-JSL contexts, the results of this study show slight differences from those in her study. Horiba suggested, based on findings in L1 reading research, that there might be possible differences in the reading processes between the narrative and expository texts; the readers of a story are trying to anticipate where the story is going,

while the reader of an essay is trying to relate each new element in the essay to earlier elements with general expectation about the overall structure of the argument. Such storage differences are critical to comprehension (Carey, 1974, in press; Carey & Lockhart, 1973). In fact, the readers in this study, unlike the L2 subjects in Horiba's study, hardly predicted or anticipated the content that would occur in succeeding portions of text. However, it is not so clear why these differences in comprehension resulted because of differences in the rhetorical structures or the way the materials were presented. In this study, the reading materials were presented in a more authentic way; the whole passage was written on a sheet of paper. In contrast, in Horiba's study, the title and each of the sentences were written on separate index cards. Thus, replications of this study with different types of reading materials and the same presentation may be necessary in order to confirm the hypothesis that the difference in rhetorical structure in Japanese requires readers to use different types of reading strategies.

Also, it may be necessary to investigate if there are any differences in the amount of verbalisation and reading processes, for Chinese readers, with background similar to those in this study, when they report their thoughts in their first language. Some of the Chinese participants in this study claimed that they tended to think in English particularly when they faced grammatical problems. These readers began their study of Japanese after coming to Canada and, therefore, they received all their instruction in English. This learning environment apparently affected the language used in their thought processes, as perceived by the readers. Thus, to identify the Chinese learners' comprehension processes in reading Japanese texts, with verbalisation in Chinese, and to compare the results to

those identified in this study may be useful, from both methodological and theoretical points of view, for the further research of language learning involved with multiple languages.

Research on reading process and strategy use in JSL is just beginning, and thus much more research is necessary. In particular, it would be crucial that a larger scale of studies be conducted in future research. Previous studies, including this study, that attempted direct observations of L2 learners' ongoing reading processes predominantly involved small numbers of subjects. Therefore, studies using large numbers of subjects should be conducted for a more comprehensive understanding of reading processes in JSL.

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APPENDIX A**BACKGROUND QUESTIONNAIRE****Reading Comprehension strategies for Japanese as a Second Language:
A Study of Chinese and Non-Chinese Speakers****Background Questionnaire**

The purpose of this questionnaire is to gather information about your language background and reading habits. It will take about 10-15 minutes to complete this questionnaire. Please answer all questions that are applicable to you. To assure anonymity, PLEASE DO NOT WRITE YOUR REAL NAME IN THIS QUESTIONNAIRE.

Note: Questions with '*'(asterisk) -- Please circle an appropriate one.

1. General Information

1. Pseudonym: _____ 2. Age: _____

3.* Sex: Male Female

4. Country of Birth: _____

2. Language Background

5.* Your first language:

English

Chinese

If your first language is Chinese, please write the name of the dialect (e.g. Mandarin Chinese). _____

6.* Do you understand any languages (except Japanese) other than your first language to any extent?

YES

NO

If your answer is YES, please write the name(s) of the language(s) and circle the level of each language skill that you can use in the language(s).

Language: _____

	Poor		Fair		Excellent	Not at all
Speaking	1	2	3	4	5	0
Listening	1	2	3	4	5	0
Writing	1	2	3	4	5	0
Reading	1	2	3	4	5	0

Language: _____

(If you understand more than two languages besides your first language)

	Poor		Fair		Excellent	Not at all
Speaking	1	2	3	4	5	0
Listening	1	2	3	4	5	0
Writing	1	2	3	4	5	0
Reading	1	2	3	4	5	0

7. What language do you usually use to communicate with your family? If you use different languages for different family members, please describe this.

8. What languages have been used as the main instruction languages in your previous education? Please write the name of the language.
 Age 6 - 11: _____
 Age 12 - 14: _____
 Age 15 - 18: _____
- 9.* Have any of your teachers provided you with exercises specifically for "effective reading skills" in your first language before?
 YES NO
 If your answer is YES, please describe briefly the instructions they provided you (e.g. your age, types of activities, types of reading skills).

10. How many hours a day do you usually read in your first language?
 _____ hours / day
11. What kind of materials do you usually read in your first language? (Please circle as many as you want.) How often do you usually read them?
 a. Newspapers _____ time(s)/week
 b. Magazines (except comics) _____ time(s)/week
 c. Novels _____ time(s)/week
 d. Technical books _____ time(s)/week
 e. Other (please specify) _____
 _____ time(s)/week

3. Japanese Language Learning

12. Which Japanese course(s) are you currently taking at this department?

13. Where and how long were you studying Japanese before taking this course?

<u>Institution</u>	<u>Period of time</u>
_____	_____
_____	_____
_____	_____
_____	_____

14. How do you evaluate your ability of Japanese language?

	Poor		Fair		Excellent
Speaking	1	2	3	4	5
Listening	1	2	3	4	5
Writing	1	2	3	4	5
Reading	1	2	3	4	5

15. Have you taken the Japanese Proficiency Test that is administered by the Japan Foundation?

YES NO

If your answer is YES, please write the level that you took and the result.

Level: _____

Result*: passed failed

16. Have you been to Japan before?

YES NO

If your answer is YES, please answer the following questions.

When?: _____

Where?: _____

How long?: _____

Purpose of your stay: _____

17. How often do you read in Japanese?

a. Almost everyday

b. Sometimes in and outside the Japanese class

c. Only in the Japanese class

d. Other (please specify) _____

18. What kinds of materials do you read in Japanese? (Please circle as many as you want.) How often do you read them?
- a. Newspapers _____ time(s)/week
- b. Magazines _____ time(s)/week
- c. Novels _____ time(s)/week
- d. Other (please specify): _____
_____ time(s)/week
19. What is the greatest obstacle for you in understanding Japanese texts? Please rank the following items in provided brackets; from 1 (the greatest obstacle) to 5 (the least obstacle).
- () Grammar
- () Vocabulary
- () Kanji
- () Frequent omission of a subject or object of a sentence.
- () Other (please specify): _____

20. Have any of your Japanese teachers provided you with exercises specifically for learning "effective reading skills" in the Japanese language before?
- YES NO
- If your answer is YES, please describe briefly the exercises that they provided you.
- _____
- _____
- _____

Thank you for your help!

PAGE 3 OF 3

STATEMENT OF INFORMED CONSENT

Reading Comprehension Strategies for Japanese as a Second Language:
A Study of Chinese and Non-Chinese Speakers

If you would like to participate in the study, please circle one of the options ("consent / do not consent"), sign and date the form and return it to Kimi Furuta. Be sure to keep the extra copy that has been supplied for your own records.

I consent / do not consent [circle one] to participation in the study outlined above (Reading Comprehension Strategies for Japanese as a Second Language: A Study of Chinese and Non-Chinese Speakers) and acknowledge that I have received a copy of this consent form and attachments.

Name (please print): _____

Signature: _____

Date: _____

Address: _____

Telephone: _____

APPENDIX C

THE EXAMPLE OF THE EXPERIMENTAL PASSAGE

待ち時間

日本人の「待ち時間」とイライラの関係について、ある調査結果が新聞に出ていた。● 日本人は何分待ったらイライラするか、という調査だ。●

この調査によると、イライラし始めるのが一番早いのは、20代の女性だそうだ。● 年齢が高くなればなるほど、がまん強くなる。● そして、男性の方が女性より少しがまん強いそうだ。● 人を待っていてイライラし始めるまでの時間は、平均20分ぐらい。● 電車やバスを待っている時は10分ぐらい、トイレでは5分ぐらいらしい。●

でも、この調査結果は少し不思議だ。● 有名な店やレストランの前に、よく長い行列ができています。● 多分30分も一時間も待つと思う。● でも、誰もあきらめない。● そして、たくさんの方が並んでいると、みんなが「安い店なのだろう」とか、「おいしいレストランなのだろう」と思って、もっと人気が出る。● それで、最近では、行列のアルバイトを頼む店もあるそうだ。●

恋人や友だちを待つ時は20分でイライラするのに、有名な店に入るためには、みんながまん強い。● わざわざ待つ店へ行く。● どうしてだろう。●

*イライラする — to get irritated

APPENDIX D**ENGLISH TRANSLATION OF THE EXPERIMENTAL PASSAGES****Passage 1 Toys**

1. Recently, it is said that the toys of young children have changed.
2. Toys that allow children, during their play, to learn about numbers or letters have increased.
3. There are also many high-tech toys that use television sets or produce vocal sounds.
4. Children quietly play with these toys alone.
5. Children talk with them in place of their mothers.
6. They naturally memorize letters or begin to learn how to calculate.
7. Mothers are relieved from trouble, and their children can learn with fun.
8. Therefore, it is said that the toys are very popular among young mothers.
9. Nevertheless, one wonders if children don't ever tire of the high-tech toys.
10. When the children answer, the toys always say only the same thing.
11. Even if the children can read a new letter, the toys only say "bing-bong" or "congratulations."
12. They never pat the children's heads, as a mother would, nor do they show a tender, smiling expression like most mothers
13. There are a lot of toys around children.
14. Boxes, spoons, and even the leaves of trees are toys for children.
15. Children devise and invent forms of play that most adults don't come across.
16. As for children, what is needed the most is not high-tech toys, but perhaps a mother who play with the children together.

Passage 2 Waiting Time

1. Recently, the results of a study regarding the relationship between waiting time and irritation among Japanese appeared in one of Japanese newspapers.
2. This study tried to investigate how many minutes of waiting time cause irritation to Japanese people.
3. According to this study, it is said that women in their twenties become irritated the fastest.
4. The higher their age become, the more people become patient (when they are waiting).
5. And, it is said men are a little more patient than women.
6. When waiting for someone, Japanese people, on average, start becoming irritated after twenty minutes.
7. When waiting for a train or bus, it seems that people become irritated after ten minutes, and for toilet, it takes about five minutes.
8. However, the results of this study is a little strange.
9. There are often long lines in front of famous shops or restaurants.
10. I think people are probably waiting from 30 minutes to one hour (in those lines).
11. However, nobody gives up (and leave).
12. And, if there are many people in line, everybody would think "The shop must be with low prices," or "The restaurant must serve very good food," and consequently, those shops become more popular.
13. Therefore, it is said that there are some shops that hire a part time workers to stand in lines in front of their shops.
14. Despite becoming irritated after twenty minutes for waiting for their friends or boyfriends or girlfriends, people are much more patient in order to entering famous shops.
15. People take the trouble to go to a shop where they have to wait in line.
16. (I wonder) Why are they doing so?

APPENDIX E

PREPOSITIONAL ANALYSIS OF THE EXPERIMENTAL PASSAGES

Passage 1 Toys

- S1: P1 (SAY PEOPLE P3)
 P2 (TIME P1 RECENT)
 P3 (CHANGE TOY)
 P4 (OF TOY CHILDREN)
 P5 (MOD CHILDREN YOUNG)
- S2: P1 (INCREASE TOY)
 P2 (ALLOW-TO TOY CHILDREN)
 P3 (DURING P2 PLAY)
 P4 (POSSESS CHILDREN PLAY)
 P5 (LEARN-ABOUT CHILDREN NUMBERS)
 P6 (LEARN-ABOUT CHILDREN LETTERS)
- S3: P1 (EXIST TOY)
 P2 (MOD TOY HIGH-TECH)
 P3 (NUMBER-OF TOY MANY)
 P4 (USE TOY TELEVISION-SETS)
 P5 (PRODUCE TOY VOCAL-SOUNDS)
- S4: P1 (PLAY-WITH CHILDREN TOYS)
 P2 (MOD P2 QUIET)
 P3 (MOD P2 ALONE)
- S5: P1 (TALK-WITH CHILDREN TOY)
 P2 (IN-PLACE-OF TOY MOTHER)
 P3 (POSSESS CHILDREN MOTHER)
- S6: P1 (MEMORIZE CHILDREN LETTER)
 P2 (MOD P1 NATURAL)
 P3 (BEGIN-TO CHILDREN P4)
 P4 (LEARN-HOW-TO CHILDREN P5)
 P5 (CALCULATE CHILDREN)
- S7: P1 (RELIEF \$ MOTHER)
 P2 (FROM P1 TROUBLE)
 P3 (ABLE-TO CHILD P4)
 P4 (LEARN CHILD \$)
 P5 (WITH P4 FUN)
 P6 (POSSESS MOTHER CHILD)

S8: P1 (THEREFORE P2 S7:P1)
 P2 (SAY PEOPLE P3)
 P3 (MOD TOY POPULAR)
 P4 (DEGREE-OF P3 VERY)
 P5 (AMONG P3 MOTHER)
 P6 (MOD MOTHER YOUNG)

S9: P1 (NEVERTHELESS P2 S8:P1)
 P2 (ONE WONDER P3)
 P3 (TIRE-OF CHILD TOY)
 P4 (NEGATE P3)
 P5 (MOD P3 EVER)
 P6 (MOD TOY HIGH-TECH)

S10: P1 (WHEN P2 P6)
 P2 (SAY TOY THING)
 P3 (MOD P2 ALWAYS)
 P4 (MOD THING SAME)
 P5 (MOD ONLY P4)
 P6 (ANSWER CHILD)

S11: P1(EVEN-IF P2 P6)
 P2 (SAY TOY "BING-BONG")
 P3 (SAY TOY "CONGRATULATIONS")
 P4 (MOD P2 ONLY)
 P5 (MOD P3 ONLY)
 P6 (ABLE-TO CHILD P7)
 P7 (READ CHILD LETTER)
 P8 (MOD LETTER NEW)

S12: P1 (OR P2 P7)
 P2 (AS P3 P6)
 P3 (PAT TOY HEAD)
 P4 (NEGATE P3)
 P5 (POSSESS CHILD HEAD)
 P6 (PAT MOTHER HEAD)
 P7 (SHOW TOY EXPRESSION)
 P8 (MOD EXPRESSION TENDER)
 P9 (MOD EXPRESSION SMILING)
 P10 (LIKE P8 MOTHER)
 P11 (NUMBER-OF MOTHER MOST)

S13: P1 (EXIST TOY)
 P2 (AROUND P1 CHILD)
 P3 (NUMBER-OF TOY MANY)

- S14: P1 (AND P2 P4 P5)
 P2 (FOR P1 CHILDREN)
 P3 (REF BOX TOY)
 P4 (REF SPOON TOY)
 P5 (REF LEAF TOY)
 P6 (POSSESS TREE LEAF)
- S15: P1 (DEVISE CHILD FORM)
 P2 (INVENT CHILD FORM)
 P3 (OF FORM PLAY)
 P4 (COME-ACROSS ADULT FORM)
 P5 (NEGATE P4)
 P6 (NUMBER-OF ADULT MOST)
- S16: P1 (REF P3 TOY)
 P2 (NEGATE P1)
 P3 (NEED CHILD THING)
 P4 (MOD P2 MOST)
 P5 (MOD TOY HIGH-TECH)
 P6 (REF P3 MOTHER)
 P7 (MOD P6 PROBABLE)
 P8 (PLAY-WITH MOTHER CHILD)
 P9 (TOGETHER MOTHER CHILD)

Passage 2 Waiting Time

- S1: P1 (APPEAR RESULT)
 P2 (TIME P1 RECENT)
 P3 (IN P1 NEWSPAPER)
 P4 (NUMBER-OF NEWSPAPER ONE)
 P5 (POSSESS STUDY RESULT)
 P6 (REGARDING STUDY RELATION)
 P7 (BETWEEN RELATION WAITING-TIME IRRITATION)
 P8 (AMONG P7 JAPANESE)
- S2: P1 (TRY-TO STUDY P2)
 P2 (IDENTIFY STUDY P3)
 P3 (CAUSE WAITING-TIME IRRITATION)
 P4 (TO P3 JAPANESE)
 P5 (AMOUNT-OF WAITING-TIME HOW-MANY-MINUTES)

- S3: P1 (ACCORDING-TO P2 STUDY)
P2 (SAY \$ P3)
P3 (BECOME WOMEN IRRITATED)
P4 (MOD P3 FASTEST)
P5 (IN WOMEN ONE'S-TWENTIES)
- S4: P1 (WHEN P2 P4)
P2 (BECOME PEOPLE PATIENT)
P3 (MOD PATIENT MORE)
P4 (BECOME AGE HIGHER)
P5 (POSSESS PEOPLE AGE)
- S5: P1 (SAY STUDY P2)
P2 (MORE-THAN P4 P5)
P3 (DEGREE-OF P2 A-LITTLE)
P4 (MOD MEN PATIENT)
P5 (MOD WOMEN PATIENT)
- S6: P1 (WHEN P2 P8)
P2 (START-TO PEOPLE P3)
P3 (BECOME PEOPLE IRRITATED)
P4 (AFTER P2 MINUTES)
P5 (NUMBER-OF MINUTES TWENTY)
P6 (MOD TWENTY AVERAGE)
P7 (MOD PEOPLE JAPANESE)
P8 (WAIT-FOR PEOPLE SOMEONE)
- S7: P1 (WHEN P2 P6)
P2 (SEEM \$ P3)
P3 (BECOME PEOPLE IRRITATED)
P4 (AFTER P3 MINUTE)
P5 (NUMBER-OF MINUTE TEN)
P6 (WAIT-FOR PEOPLE TRAIN-BUS)
P7 (WHEN P10 P8)
P8 (TAKE P3 MINUTE)
P9 (NUMBER-OF MINUTE FIVE)
P10 (WAIT-FOR PEOPLE TOILET)
- S8: P1 (HOWEVER P2 P6-P7)
P2 (MOD RESULT STRANGE)
P3 (DEGREE-OF P2 A-LITTLE)
P4 (POSSESS STUDY RESULT)

S9:P1 (EXIST LINE)
 P2 (IN-FRONT-OF P1 SHOP)
 P3 (IN-FRONT-OF P1 RESTAURANT)
 P4 (MOD P1 OFTEN)
 P5 (MOD LINE LONG)
 P6 (MOD SHOP FAMOUS)
 P7 (MOD RESTAURANT FAMOUS)

S10:P1 (THINK AUTHOR P2)
 P2 (WAIT PEOPLE)
 P3 (MOD P2 PROBABLE)
 P4 (BETWEEN P2 MINUTE HOUR)
 P5 (NUMBER-OF MINUTE THIRTY)
 P6 (NUMBER-OF HOUR ONE)

S11:P1 (HOWEVER S10:P1 P2)
 P2 (GIVE-UP NOBODY)

S12:P1 (IF P2 P11)
 P2 (THINK PEOPLE P4)
 P3 (NUMBER-OF PEOPLE ALL)
 P4 (OR P5 P8)
 P5 (MUST SHOP P6)
 P6 (WITH SHOP PRICE)
 P7 (DEGREE-OF PRICE LOW)
 P8 (MUST RESTAURANT P9)
 P9 (SERVE RESTAURANT FOOD)
 P10(MOD FOOD GOOD)
 P11(EXIST PEOPLE)
 P12(NUMBER-OF PEOPLE MANY)
 P13(IN PEOPLE LINE)
 P14(CAUSE P15 P2)
 P15(BECOME SHOP POPULAR)
 P16(DEGREE-OF P15 MORE)

S13:P1 (SAY PEOPLE P2)
 P2 (BECAUSE S12:P14 P3)
 P3 (HIRE SHOP WORKERS)
 P4 (TIME P4 RECENT)
 P5 (NUMBER-OF SHOP SOME)
 P6 (MOD WORKER PART-TIME)
 P7 (CAUSE SHOP P8)
 P8 (STAND WORKER)
 P9 (IN-FRONT-OF P8 SHOP)
 P10 (IN WORKER LINE)

S14:P1 (ALTHOUGH P2 P7)
P2 (IN-ORDER-TO P3 P5)
P3 (MOD PEOPLE PATIENT)
P4 (DEGREE-OF P3 MORE)
P5 (ENTER PEOPLE SHOP)
P6 (MOD SHOP FAMOUS)
P7 (WHEN P8 P11)
P8 (BECOME PEOPLE IRRITATED)
P9 (AFTER P8 MINUTE)
P10(NUMBER-OF MINUTE TWENTY)
P11(WAIT-FOR PEOPLE ROMANTIC-PARTNER)
P12(WAIT-FOR PEOPLE FRIEND)

S15:P1 (IN-ORDER-TO P2 P3)
P2 (TAKE PEOPLE TROUBLE)
P3 (GO PEOPLE SHOP)
P4 (MUST PEOPLE P5)
P5 (WAIT PEOPLE)
P6 (AT P5 SHOP)

S16:P1 (WHY P2)
P2 (DO PEOPLE S15:P1)