EFFECTS OF READING ASSIGNMENT FORMATS ON SECOND LANGUAGE READING COMPREHENSION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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ABSTRACT

This study investigated the effects of three reading assignment formats (no assignment, a multiple-choice assignment, and a writing assignment) on second language reading comprehension measured by a multiple-choice test and written recall protocols. The subjects were 120 international graduate students studying in various fields at The Ohio State University. They were classified as low proficiency and high proficiency in English language according to their TOEFL scores and were asked to read either a difficult or an easy text.

The subjects were then randomly assigned to one of the three reading assignment formats. Those in no assignment format were not given any information about what they had to do after reading a text. The subjects in the multiple-choice format were informed about the multiple-choice task and those in the writing format were informed about the writing task they had to do after reading the text. Regardless of what they were told, all the subjects had to write whatever they could remember and also complete a multiple-choice test after they finished reading the text.
The scores from the written recall protocols and multiple-choice tests were analyzed using three-way multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA). The results indicated that reading assignment formats, English proficiency, and the interaction between the two had significant effects on reading comprehension. However, text difficulty was not found to be a contributing factor in the subjects' reading performance. In general, the writing assignment format yielded the highest scores for both the multiple-choice tests and the written recall protocols. Post hoc procedures for multiple comparisons revealed that reading assignment formats had different effects on low proficiency versus high proficiency subjects. Those observed effects differed according to the measurements of reading comprehension used in this study. The results are discussed in terms of pedagogical implications and recommendations for further study are presented.
To the memory of my father
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CHAPTER 1

INTRODUCTION

In many parts of the world, the ability to read and understand a second language is crucial for academic success, professional progress, and personal development. This is particularly true of English - a language in which so much technological and scientific literature has been published. In academic settings, the ability to read in English is often required of students and is commonly assessed by a test of reading comprehension (Alderson, 1984). For many students, says Carrell (1988), reading is probably the most important of the four skills in a second language, particularly in English as a second language. Grabe (1991) also acknowledges that reading is probably the most important skill for second language learners in academic contexts, which is one of the causes that have contributed to the remarkable growth of research on reading in a second language and efforts to improve second language reading instruction. Reading is paramount in advanced levels of second language teaching/learning situations that
make extensive use of academic materials written in English. Without solid reading proficiency, second language students often find it difficult to succeed or to compete with their classmates who are native speakers of English. In addition, Bernhardt (1991) states that adult nonnative learners who need employment must attain functional literacy skills, while graduate students seeking advanced degrees in universities must attain very sophisticated literacy skills. Despite the need and the recognized importance of reading ability in English as a second language, a large portion of students still read with difficulty. Carrell (1988) suggests that effective reading is critical and that professionals in second language education should be concerned with approaches that can improve the reading skills of second language learners.

In an attempt to improve second language reading ability, researchers in this field have directed their attention to various factors that might influence comprehension of the text being read. One of the factors which is closely related to second language reading comprehension is the student's overall level of proficiency in the particular language. Researchers such as Bernhardt (1986) Clarke (1979), and Cziko (1980) have argued that knowledge of a second language plays an important role in second language reading. They claimed that language is the
key factor in reading performance. In other words, the ability to read a language is related to one's proficiency in the language.

Text is also an important factor in second language reading as reading always involves an interaction between a reader and written material. Bernhardt (1991) states that without words, sentences, and paragraphs, reading would not exist. Just and Carpenter (1980) viewed text as the most critical feature in the understanding of reading. Davis (1994) agrees, suggesting that instructors should select second language texts carefully, with special attention given to their content and rhetorical structure. Davis' suggestion is corroborated by Bernhardt (1983a) who explained that reading comprehension may be impeded when a passage contains unfamiliar cultural content. Finally, Coady (1979) pointed out that the level of text difficulty should be taken into account because second language readers may not be linguistically capable of understanding the content or rhetorical organizations of the particular text.

Another important issue in second language reading is determining appropriate ways to measure reading comprehension validly and reliably. The measurement formats for assessing reading comprehension commonly used in the field of second language includes matching, cloze tests, short-answer questions, summary writing, and multiple-choice
items. There seems to be a general consensus that no particular measurement format is perfect in all circumstances, nor is any one format appropriate for all students. As a result, multiple procedures for testing reading comprehension have been recommended (Bernhardt, 1991; Shohamy, 1984; Spolsky, 1989).

The present study which deals with second language reading focuses on three reading assignments commonly found in second language classrooms. They are (1) reading without any follow-up assignment, (2) reading followed by a multiple-choice assignment, and (3) reading followed by a writing assignment. The investigation was carried out to determine if reading comprehension scores are similar or different across these three types of reading assignments. Two other variables included in the study are overall level of second language proficiency and text difficulty. Multiple-choice questions and written recall protocols were used to measure reading comprehension.

1.1 The Problem Statement

Interest in second language reading has increased during the past few decades. Theories have been built and research has been carried out. The issues under investigation include measurements of reading comprehension (Bachman, 1990; Cohen, 1991; Hancock, 1994; Oller, 1983;
Shohamy, 1984; Spolsky, 1989), sociocultural and cognitive differences between native and nonnative readers (Bernhardt, 1991; Douglas, 1981; Elley, 1984; Sarig, 1987), and teacher and student behaviors that seem either to facilitate or impede text understanding (Ellis, 1986; Gardner, 1985; Lightbown & Spada, 1993; Long, 1990; Pica, Young & Doughty, 1987). Several studies have emphasized the role of certain factors that are presumed to affect reading comprehension, for example, first language (L1) and second language (L2) proficiency (Bernhardt, 1991; Bernhardt & Kamil, 1995; Donin & Silva, 1993; McLaughlin, 1987), background knowledge (Adams, 1982; Alderson & Urquhart, 1988; Johnson, 1982; Lee, 1986; Nunan, 1985), and cultural diversity (Basham, Ray & Whalley, 1993; Carrell, 1987; Flower, Stein, Ackerman, Kantz, McCormick, & Peck, 1990). Other studies investigated the conditions of reading, for example, authentic versus syntactically simplified texts (Barnett, 1986; Blau, 1982; Strother & Ulijn, 1987), silent versus oral reading modes (Bernhardt, 1983), and presence versus absence of dictionary as well as pictorial cues (Bensoussan, Sim & Weiss, 1984; Bialystok, 1983; Taglieber, Johnson & Yarbrough, 1988). Despite an extensive literature search about the impact of three reading assignment formats (e.g., no assignment, multiple-choice assignment, and a writing assignment) on second language reading comprehension, no research was
found. The purpose of this study was, therefore, to investigate the effects of three reading assignment formats on second language reading comprehension for adult L2 readers. This investigation included two levels of second language proficiency (high and low) and two levels of text difficulty (easy and difficult). Reading comprehension was assessed by multiple-choice questions and written recall protocols.

1.2 Significance of the Study

The importance of second language reading, particularly in English, has been ubiquitously recognized. The main reason is that English has become a major vehicle of written communication throughout the world. Also, written texts are accessible sources of knowledge. The ability to read English as a second language is, therefore, a crucial tool for academic as well as professional development. This study addresses the topic of second language reading and is significant in several ways. First, research involving three reading assignment formats: no assignment, multiple-choice assignment, and writing assignment, was not found. Since such research might have never been conducted or reported in the professional literature, this study has the potential to add new information to the field of second language acquisition and
expand this area of research. Second, the three reading assignment formats which are under investigation in this study are commonly used in second language teaching and learning situations. The findings are, therefore, relevant and applicable to those involved in such situations. Third, this study, which also includes a writing assignment, not only adds information to the second language reading field, but it also adds to the area of read-to-write or reading-writing relationships in a second language. Fourth, it provides an additional database and insights into second language reading, particularly about the effects of the three reading assignment formats and their interactions with text difficulty and English proficiency level on reading comprehension. Finally, the results of the study can help improve student performance in the reading of English as a second language, for example, by using the reading assignment format that is the most effective according to the level of English proficiency and text difficulty.

1.3 Research Questions

This study was conducted to investigate the research questions listed below; they are grouped into primary and secondary questions. Primary questions deal with the effects of the three variables (reading assignment formats, second language proficiency, and text difficulty) on second
language reading comprehension. Secondary questions deal with the effects of the interactions between as well as among the three variables (reading assignment formats, second language proficiency, and text difficulty) on second language reading comprehension.

**Primary questions:**

1. Is there a significant difference in comprehension scores among three reading assignment formats: no assignment, a multiple-choice assignment, and a writing assignment, as measured by a multiple-choice test and written recall protocols?

2. Is there a significant difference in comprehension scores between low and high second language proficiency students, as measured by a multiple-choice test and written recall protocols?

3. Is there a significant difference in comprehension scores between easy and difficult texts, as measured by a multiple-choice test and written recall protocols?

**Secondary questions:**

4. Is there a significant interaction between the three reading assignment formats and the level of second language proficiency, as measured by a multiple-choice test and written recall protocols?
5. Is there a significant interaction between the three reading assignment formats and the level of text difficulty, as measured by a multiple-choice test and written recall protocols?

6. Is there a significant interaction between the level of second language proficiency and the level of text difficulty, as measured by a multiple-choice test and written recall protocols?

7. Is there a significant interaction among the three reading assignment formats, the level of second language proficiency, and the level of text difficulty, as measured by a multiple-choice test and written recall protocols?

1.4 Definition of Terms

In order to establish a consistent and common meaning for the terms used in this study, the key terms are operationally defined as follows:

Comprehension scores: The subjects' reading comprehension of texts was measured by a multiple-choice test and written recall protocols. Thus, comprehension scores for each subject consisted of a score from a multiple-choice test and a score from written recall protocols.

Difficult text: One of the two texts used in this study which is classified as more difficult than the other by
certain criteria (see text difficulty). In this study, the difficult text is "Graduate Research Forum" which has a total of 148 words and the mean length of T-units of 14.70. Easy text: One of the two texts used in this study which is classified as easier than the other by certain criteria (see text difficulty). In this study, the easy text is "Managing Time" which has a total of 145 words and the mean length of T-units of 7.63.

High proficiency subjects: The subjects in this study whose TOEFL scores were either 579 or higher.

Low proficiency subjects: The subjects in this study whose TOEFL scores were lower than 579.

Multiple-choice assignment format: The subjects were informed that they have to complete a multiple-choice test based on the reading immediately after reading a text.

No assignment format: The subjects were not informed about what they have to do after they finish reading texts. The choice of follow-up was not defined by the instructor.

Reading assignment formats: Three reading assignment formats were used with the subjects. They are (1) no assignment, (2) a multiple-choice assignment, and (3) a writing assignment.

Recall protocols: An alternative measure of reading comprehension assessment in which the subjects write down everything they remember immediately after reading a text.
The written recalls were scored, using the scoring templates developed for both easy text (see Appendix G) and difficult text (see Appendix H).

**Second language:** The language that the subjects did not learn or use as their first language. In this study second language means English for all subjects.

**Second language proficiency:** The subjects' proficiency level in English which was divided into high and low proficiency according to their most recent TOEFL scores. TOEFL was selected as a measure because it is a standardized test for English language proficiency and most of the international graduate students studying in the United States are required to take this test. The subjects' proficiency level, therefore, was identified by their TOEFL scores.

**Text difficulty:** Two English texts were used in this study, one identified as difficult and another as easy. The criteria for identifying difficult and easy texts included the total number of words each text contains, the independent ratings by three native speakers of English for each text, and the mean length of T-units within each text.

**T-unit:** One main clause plus any subordinate clause or nonclausal structure that is attached to or embedded in it (Gaies, 1980).
**Writing assignment format:** The subjects were informed that they would have to write an essay describing what they remembered immediately after reading texts.

### 1.5 Basic Assumptions

In order to conduct this study, the following assumptions were made:

1. Since this study dealt with reading and involved measuring reading comprehension, it was assumed that reading is a language skill that can be measured.

2. It was assumed that multiple-choice questions and written recall protocols are valid reading comprehension measurements and, therefore, can adequately measure students' reading comprehension of texts.

3. The subjects were assumed to have cooperated voluntarily in the research and complete the tasks to the best of their ability.

4. TOEFL scores were assumed to be an appropriate measure to identify the proficiency level of the subjects.
1.6 Organization of the Dissertation

The dissertation is divided into five chapters as follows:

Chapter 1 includes the introduction, problem statement, significance of the study, research questions, definitions of terms, and basic assumptions for the study.

Chapter 2 is a review of the related professional literature that provides background for the study.

Chapter 3 describes the sample population, instruments, data collection procedures, and the pilot study.

Chapter 4 reports the data, analysis of the data, and results of the study.

Chapter 5 includes answers to the research questions, discussions of the results, pedagogical implications, limitations of the study, and recommendations for further research.

The appendices include the background information sheet, directions for each reading assignment format, easy text, difficult text, multiple-choice test for the easy text, multiple-choice test for the difficult text, written recall scoring template for the easy text, and written recall scoring template for the difficult text.
CHAPTER 2

REVIEW OF THE LITERATURE

This chapter, in which literature in second language reading is reviewed, is divided into two parts. The first part discusses three issues that serve as theoretical foundations for this study. They are (1) reading as cognitive and social processes, (2) reading in different ways for different purposes, and (3) the reading-writing relationship. The second part of this chapter summarizes previous research related to the present study, with the focus on empirical studies which investigated the effects of reading factors or other experimental treatments on second language reading comprehension. This part includes (1) research on the effects of language proficiency on reading comprehension, (2) research involving text reading activities, text structures, and reading comprehension, (3) research on the effects of pre-reading questions and titles on reading comprehension, and (4) research investigating the effects of other factors, using recall protocols. Finally,
a summary of the research is presented at the end of the chapter.

2.1 Theoretical Issues in Second Language Reading

Issues concerning reading in a second language are numerous. For the purposes of the study, this part of the literature review particularly focuses on the issues that are closely associated with the topic being studied. It describes how reading involves both cognitive and social processes, followed by the notion of reading for different purposes, and concludes with the relationship between reading and writing.

2.1.1 Reading as cognitive and social processes

Reading as cognitive and social processes is a theoretical issue that is fundamental for the understanding of the sophisticated multifaceted phenomenon of reading. Although discussed separately, cognitive and social processes of reading are integrated and intertwined.

In Webster's Seventh New Collegiate Dictionary (1971), a cognitive process is defined as a set of ordered stages or a set of operations that accomplish some goal. Just and Carpenter (1987) included five elements in their definition of cognitive process: (1) what information in the text starts the process, (2) how long the process takes,
(3) what information was used during the process, (4) the likely sources of mistakes, and (5) what the reader has learned when the process is finished (p. 4). In addition, the cognitive model of reading describes the reading process as a non-linear one in the sense that individual readers are active in their selection of portions of the text for processing (Just & Carpenter, 1980).

In Reading Development in a Second Language, Bernhardt (1991) stated that taking a cognitive perspective means examining the reading process as an intrapersonal problem-solving task that takes place within the brain's knowledge structures (p.6). Hayes (1989) further explained that:

"To understand a problem, the problem solver creates objects and relations in his head which correspond to objects and relations in the externally presented problem. These internal objects and relations are the problem solver's internal representation of the problem. Different people may create different internal representations of the same problem" (p.5).

Hayes' explanation reflects Bernhardt's cognitive perspective of the reading process which involves the brain's knowledge structures. Individual readers would approach the same texts in different ways and create different objects and relations in their heads. This perspective is also echoed by Just and Carpenter (1980), who
stated that individual readers are active in their selection of portions of the text for processing.

As a social process, reading is used to establish, structure, and maintain social relationships among peoples. It is part of the processes of cultural transmissions, enculturation, and socialization (Bloome & Green, 1984). Bernhardt (1991), expressing a similar view, stated that reading performs a socializing function. She claimed that the social view of reading is rooted in the belief that texts are manifestations of cultures, which inherently imply value systems, idiosyncratic knowledge, and beliefs held between the writer and the implied reader. When texts are viewed as cultural artifacts, they become fluid and open to multiple interpretations. According to this view, there are no generic or generalized readers or reading behaviors. Rather, there are multiple readers within one person because each context will influence each reader, meaning that a different reader will surface depending on the context. Integrating cognitive and social views of reading, Bernhardt (1991) posited that readers are not static entities, but are individuals who change and react differentially. In other words, they are different readers at different times (pp.9-15).

In short, the literature on cognitive and social views of reading indicates that the process and products of
reading will not always be the same, but will be affected by several factors such as contexts, conditions, or purposes of reading. Based on these theoretical perspectives, different reading assignments, which in the present study include (1) no assignment, (2) multiple-choice assignment, and (3) writing assignment, should lead to different ways of reading (i.e., different degrees of attention paid to the texts), and reading comprehension would also vary across the three reading assignments.

2.1.2 Reading in different ways for different purposes

Researchers and practitioners seem to agree that readers do not always read written materials in the same way. Eskey (1986) stated that the literature on reading has pointed out that readers read for different purposes and that those purposes affect what is attended to and with what intensity. Similarly, Nuttall (1982) made a general statement that readers have a variety of reasons for reading, and that the way readers tackle the task is strongly influenced by their purpose for reading. For example, the quick scanning of a page in the telephone directory to find a single name is very different from the careful attention a reader pays to each word in a legal document. And reading street maps, diagrams, or graphs is unlike reading a book. Royer, Bates and Konold (1984)
seemed to agree with the notion of reading in different ways for different purposes and provide other examples of varying outcomes caused by different ways or purposes of reading. They discuss, as an example, that after reading a novel or short story for pleasure, readers can report general details with ease, but recalling with more detail may be difficult, and may be based more on general knowledge than on remembered fact. After reading a professional article, however, most researchers could report in great detail the logic, citations, specific procedures, outcomes, and conclusions of the article they have read with little difficulty.

Royer et al. (1984) used the example above (reading a novel versus reading a professional article) to point to the fact that the level of detail learned from text will vary depending on what the reader wants to learn from text. In addition to level of detail, reading intent can also affect the nature of the information that is acquired from text. They also discuss three techniques of task manipulation that have been found to affect text learning. The three techniques include presenting readers with learning objectives that specify what is to be acquired from the text, inserting questions into the text, and asking readers questions that require more than the recall of specific information. Supporting Royer et al., Alderson and
Urquhart (1984) suggested that teachers and materials designers need to remember that different purposes will lead to different products. The experimental evidence discussed by Royer et al. also implied that it is possible to train someone in desirable reading habits by manipulating the reading tasks. For example, inserting questions throughout the body of a text might be a useful first step to encourage the reader to formulate his/her own questions while reading. However, such a strategy might also inhibit certain readers.

The notion of reading in different ways for different purposes serves as a fundamental theoretical perspective for this study. Different reading assignment formats (i.e., no assignment, a multiple-choice assignment, and a writing assignment) may signify different purposes and, therefore, may lead to different ways of reading. Consequently, comprehension may also vary across the reading assignment formats. The present study investigates such an impact on adult readers' comprehension of a given text in English.

2.1.3 Reading for writing: The connection and the purpose

The relationship between reading and writing has been one of the current and the most discussed issues in second language reading. In his article, Grabe (1991) identified five important areas of current research which
should remain prominent for this decade - schema theory, language skills and automaticity, vocabulary development, comprehension strategy training, and reading-writing relations.

Many researchers posit that reading and writing are connected and enhance each other. Davis (1994), for example, stated that historically there has been a persistent link between reading and writing. "The notion that reading great works of prose and poetry will lead to the development of good writing skills dates back to ancient Greece" (p. 142). Valette (1994) proposed that the first two steps towards building written communication skills are reading texts in the second language and learning how the language works. Kucer (1987) claimed that reading and writing share the same knowledge and process because: (1) both draw on a common data pool of written language, (2) both utilize similar transformation processes of background knowledge, and (3) both employ common processing patterns in text production as individuals read and write. In other words, whatever processes a reader uses to make meaning of a text may also be the same processes that a writer uses to create meaning. Similarly, Tierney and Leys (1986) asserted that, "the study of reading and writing connections involves appreciating how reading and writing work together in myriad ways as tools for information storage and retrieval,"
discovery and logical thought, communication, and self-indulgence" (p. 26). Spivey (1990) suggested that an act of composing from sources should not be envisioned as a two-step procedure, reading and then writing. If we do so, however, we would be ignoring the influence writing can have on the reading process. She elaborated that, "when writers compose from sources, reading and writing processes blend, making it difficult, if not impossible, to distinguish what is being done for purposes of reading from what is being done for purposes of writing" (p. 258). Acts of composing are, therefore, hybrid acts of literacy in which writing influences reading and reading influences writing. Finally, Leki (1993) argued that writing provides a real purpose for reading. She mentioned that the purpose of reading plays an important role in reading comprehension and that this concern with purpose has emerged in the second language classroom most clearly in pre-reading questions intended to lend direction to reading by giving students a guide in their reading. That should make the text easier to read, but "the failure to provide real purposes for reading suggests that in isolated L2 reading classes (i.e., ones in which students are not reading to write), students are not reading but merely practicing reading" (Leki, p. 13).

Based on the above discussions, it can be seen that writing and reading processes are closely related. Also,
writing provides a purpose for reading and can help enhance understanding of the text being read. One of the objectives of the present study was to investigate whether reading followed by a writing assignment is likely to result in better comprehension of the texts than reading without an instructor-given assignment and reading followed by a multiple-choice task.

2.2 Research in Second Language Reading Comprehension

Research in second language reading has involved second language readers of different proficiency levels under a number of different research conditions, using a variety of text manipulations. This part of the review of the literature focuses on studies concerned with experimental treatments and/or manipulating task demands and their effects on reading comprehension. The purpose is to demonstrate that reading comprehension can be affected by various factors and different conditions of reading. Several of these are described below.

2.2.1 Research on the effects of second language proficiency on second language reading comprehension

Second language reading researchers have conducted numerous studies concerning the impact of different levels of language proficiency on reading comprehension. Among
others, Perkins (1983) carried out a study of semantic constructivity in ESL reading comprehension, examining second language readers' comprehension of sets of related sentences. The subjects involved were 43 ESL students enrolled in intensive English classes at Southern Illinois University. They were divided into three proficiency levels (beginning, intermediate, and advanced). Materials were 10, 3-sentence paragraphs and the recognition set of sentences which consisted of 40 sentences, 4 related to each paragraph. The subjects were asked, after each paragraph, to classify each of the following 4 types of sentences as ones they had or had not read: a true statement, a false statement, a true inference, and a false inference. An analysis of variance indicates that the beginning and intermediate levels made more misrecognitions of sentences than the advanced level.

In another study, Guarino and Perkins (1986) employed 35 ESL students also enrolled in intensive English classes at Southern Illinois University. The purpose was to determine whether there is a relationship between language proficiency, particularly the awareness or recognition of form class (morphology competence), and reading comprehension. Four word classes, nouns, verbs, adjectives, and adverbs, were chosen for measuring the subjects' awareness of the structural aspects of written texts. Each
item in the test consisted of two sentences. The first sentence contained nonsense words which can be identified by syntactic patterning. The second sentence contained a blank and four options. A multiple-choice test consisting of 48 items based on eight passages was used to measure reading comprehension. Correlational analyses indicated that awareness of form class and reading comprehension are significantly related, that is, the subjects who exhibit proficiency in a test of awareness of form class also exhibit proficiency in reading comprehension. But the researchers pointed out that morphology competence is only one dimension of reading comprehension.

Barnett (1986) conducted an experiment about language proficiency, particularly syntactic and lexical/semantic skills in second language reading. The experiment involved 124 English speaking students learning French at the University of Virginia. They were asked to read two French stories. Three sets of scores were obtained from the experiment: (1) syntactic analysis scores from the cloze test, (2) vocabulary analysis scores from the cloze test, and (3) recall scores from the protocols. Syntactic and vocabulary scores were then divided into three levels (high, medium, and low). The results from analysis of variance showed that both syntactic and vocabulary proficiency affect reading comprehension, as recall
increases according to level of syntactic and vocabulary proficiency.

A study by Hudson (1982) investigated the effects of second language proficiency levels and three experimental treatments on reading comprehension. The subjects were 93 foreign students studying English as a second language in the United States. They were classified as beginning, intermediate, and advanced levels according to their reading class level. In the pre-reading treatment, the subjects were given a set of cue pictures and were asked a set of focus questions before reading a passage and taking a multiple-choice test. In the vocabulary treatment, the subjects were given a list of vocabulary and definitions of all items before reading a passage and taking a multiple-choice test. In the read-test treatment, the subjects were asked to read a passage and complete a multiple-choice test and read the same passage and complete the same test again. The results of an analysis of variance indicated that different types of treatment were effective at different levels of proficiency. While the vocabulary and read-test treatments were less effective than the pre-reading treatment at the beginning and intermediate levels, both of them were equally or more effective at the advanced level.

Studies have shown that language proficiency plays an important role in the ability to comprehend a written
text. However, studies have also shown that language proficiency is not the only factor in reading comprehension. In the present study, second language proficiency was expected to affect reading comprehension, but reading assignment formats (no assignment, a multiple-choice assignment, and a writing assignment) and text difficulty (easy and difficult) were predicted to interact with language proficiency and influence reading comprehension. In other words, different reading assignment formats could be effective at different levels of English proficiency and text difficulty. This was a topic under investigation in the present study.

2.2.2 Research involving text reading activities, text structures, and reading comprehension

Text is unarguably a critical factor in reading. Researchers have tried to approach or read texts in the most effective way. For example, Bensoussan, Sim, and Weiss (1984) conducted three similar investigations involving 91 advanced English as a second language (ESL) students. In the first experiment, the subjects read texts in three different dictionary conditions: monolingual dictionary, bilingual dictionary, and no dictionary. In the other two experiments, the subjects self-selected the condition of monolingual dictionary, bilingual dictionary, or no
dictionary. Multiple-choice questions were used to measure their reading comprehension. Texts were not removed during the test. Although the results revealed a preference for a bilingual dictionary, no significant correlation was obtained between dictionary use and comprehension scores. In fact, it was found that better students used a dictionary less, and were more likely to use a monolingual dictionary than a bilingual dictionary. Third-year students looked up more important words, while first-year students guessed less and looked up more words regardless of their importance to the texts.

The results of these studies need to be interpreted with caution because no attempt was made to check on students' actual usage of a dictionary. The availability of texts during the test could also affect reading comprehension.

Taglieber, Johnson, and Yarbrough (1988) investigated the effects of three pre-reading activities: pictorial context, vocabulary pre-teaching, pre-questioning, and a control condition, on reading comprehension. The subjects were 40 undergraduate Brazilian EFL students. All subjects read four different passages, each passage under one of the four conditions. An 8-item open-ended test and a 10-item multiple-choice test were administered immediately after the reading of each passage. Multivariate analysis of
variance revealed that all three pre-reading activities produced significantly higher scores than the control condition. Vocabulary pre-teaching was found to increase comprehension, but was less effective than the pictorial context and the pre-questioning conditions.

Apart from different approaches to written texts, the effects of different text structures were also under investigation. The review of the literature now turns to studies concerned with text structures, particularly studies that investigated the impact of different degrees of syntactic complexity on reading comprehension.

In his study, Blau (1982) employed three versions of the same text with syntactic variations. The subjects were 85 college and 111 junior high ESL students. Multiple-choice questions were used to measure comprehension after the subjects read each version of the text. The results showed that more syntactically complex, unedited texts yielded higher comprehension for both groups of the subjects. Strother and Ulijn (1987) conducted an experiment to test for significant differences between scores on a reading comprehension test by university students who read an authentic text and those who read a syntactically simplified computer science journal article. The subjects included students whose first language was English and those who studied English as a second language. True/false
questions were used to measure comprehension, and chi-square was used to analyze the data. The results showed that syntactic complexity did not affect comprehension, but vocabulary did. The researchers concluded that what was needed is not syntactic rewriting of professional texts but lexical rewriting to increase readability.

Strother and Uijin's study (1987) corroborated Blau's (1982) in the sense that syntactic simplification does not lead to better comprehension of the texts. The findings of the former were also in accordance with Taglieber, Johnson, and Yarbrough’s study (1988) which revealed that knowledge of vocabulary helped increase students' reading comprehension.

The studies reviewed thus far may not be directly related to the present study, but they demonstrate that certain conditions of reading texts and different text structures may or may not affect students' reading comprehension. This serves as an impetus to test for significant differences among the three reading assignment formats (no assignment, a multiple-choice assignment, and a writing assignment) and their interaction with different levels of text difficulty (easy and difficult).
2.2.3 Research on the effects of pre-reading questions and titles on reading comprehension

One of the pre-reading activities investigated by Taglieber, Johnson, and Yarbrough (1988) is pre-questioning. It consisted of giving subjects a one-sentence oral summary of the reading passage and asking them to formulate some questions that they thought the passage might answer. The summary guides the pre-questioning activity, thereby focusing the students' pre-questions on the passage to be read. The results showed that pre-questioning produced significantly higher multiple-choice scores than the control condition. In another study, Manchester (1984) examined the effects of various types and positions of adjunct questions on the college students learning French as a second language. The findings revealed that higher-order questions led to higher scores on the recall measures, regardless of their position (i.e., before or after reading the text).

Title is regarded as an advance organizer that conveys the topic or main idea of a reading passage. Based on the notion that the interpretations the readers give to the passages are related to the title, Adams (1982) designed a study to investigate the impact on the recognition of unfamiliar vocabulary in the presence of what she called script activators (telling the students what the passages were about) or the absence of script activators (not telling
the students what they were about to read). The subjects consisted of 124 French students and 174 psychology students. An analysis of variance showed that the presence of a script activator yielded a higher score on unfamiliar vocabulary and a higher comprehension score. In this study, script activators seemed to have a similar function as titles.

Kim (1989) conducted a study about the effects of thematic titles on recall measures of reading comprehension. The subjects involved were 40 Korean graduate students who were randomly assigned to title, no title, and pre-reading questions conditions. They read four expository texts - two in English and two in Korean, and were told to write down everything they could remember about the texts. Analysis of variance was used to analyze the data. It was found that the title group scored highest, followed by the pre-reading questions group and the no-title group, respectively. The pre-reading questions group, however, demonstrated the best performance among the three groups on the difficult L2 text. The researcher suggested that titles and/or pre-reading questions might have helped activate schema relevant to the text, thereby facilitating comprehension of the text.

Research has shown that titles and pre-reading questions facilitate reading comprehension. It was speculated that titles and/or pre-reading questions provide
a sense of direction or a purpose for reading. In the present study, the subjects who read without any follow-up assignment and, therefore, did not get any information about what to do after reading the texts may produce lower comprehension scores than the subjects who knew that they had to do multiple-choice tasks and writing assignments after the reading.

2.2.4 Research investigating the effects of other factors, using recall protocols

Recall is a common measure for the assessment of reading comprehension in L1 research. Johnston (1983) considered recall as the most straightforward assessment of the result of the text-reader interaction. Bernhardt (1983) recommended the use of recall as an alternative form of assessment to check comprehension in second language reading, stating that recall reveals something about the organization of stored information, the retrieval strategies used by readers, and the method of reconstruction which the reader uses to encode information in a text. Hayes (1989) described protocol analysis as the most powerful tool for tracking psychological processes.

Employing recall protocols, Johnson (1981) conducted a study of the effects on reading comprehension of language complexity and cultural background of a text. Forty-six
Iranian ESL students were divided into two groups, with one group reading non-adapted English texts of Iranian folklore and American folklore and the other reading simplified versions of the same stories. Multiple-choice questions and recall protocols were used to measure reading comprehension. The results from multivariate analysis of variance (MANOVA) indicated that the level of syntactic and semantic complexity had a lesser effect than the cultural background, but both affected reading comprehension. The researcher suggested that cultural background should be considered as a criterion in the selection of reading materials and in the evaluation of reading comprehension.

A similar study was carried out later by Carrell (1987). Twenty-eight Muslim and 24 Catholic ESL students at Southern Illinois University at Carbondale read, recalled, and answered questions about two texts. One text had culturally familiar content while the other had culturally unfamiliar content. The subjects also read the texts either in familiar or unfamiliar rhetorical formats. Analyses of data from question answers and recall protocols using a computer statistical package (SAS) showed that the subjects who read the text containing familiar content and familiar rhetorical form had better comprehension than those who read the text containing unfamiliar content and unfamiliar rhetorical form. It was also found that content schemata,
or knowledge relative to the content of the text, had more
effect than formal schemata, or knowledge relative to
rhetorical, organizational structures of different types of
texts. Carrell suggested that teachers of ESL reading
should be aware of the important role of cultural content of
texts. They also need to be cognizant of the rhetorical
organization of texts and should teach students to recognize
and use the rhetorical organization to facilitate
comprehension and recall.

Bernhardt (1983) investigated the impact of oral
versus silent reading modes on reading comprehension. The
subjects were 14 college students learning German as a
second language. They read expository texts in both oral
and silent modes, and were asked to write down everything
they could remember from the texts. The written recalls
were scored by three raters, and a three-way ANOVA was
performed on the data. The results demonstrated that silent
reading may be the better mode for the instruction of
reading comprehension for students regardless of grammatical
ability.

A study by Pederson (1986) involved 136 students
learning French at Ohio State University. The purpose was
to investigate the effects of passage-available versus
passage-unavailable conditions on reading comprehension. In
the former, the passage remained on the computer display
during questioning. In the latter, the passage was removed from the computer display when the subject pressed the carriage return to view a post-question. After subjects completed the experimental tasks and questions, they were asked to write down everything they remembered from the passage they had read. A three-way ANOVA was used to analyze the data. The findings indicated that the passage-unavailable condition always resulted in a higher comprehension rate than the passage-available condition regardless of the level of question or level of verbal ability.

Davis, Lange, and Samuels (1988) carried out a study about the effects of text structure instruction on readers' recall, involving 40 undergraduate students enrolled in a French class at the University of Minnesota. The subjects were randomly assigned to a condition in which they were informed about the organization of a journal article or a condition in which they were not informed. The subjects in each condition were then assigned to read a scientific article in French that used or did not use canonical organization before completing a recall task in English. An analysis of variance showed a significant main effect for instruction in text structure when the text was in canonical order. The researchers concluded that knowledge of
structure obtained through instruction may be used in reading comprehension and recall.

Summary

Several points can be made from this review of the related professional literature. First, reading is a complex process that involves interactions among several components, such as readers, texts, and contexts. Second, a reader does not always read texts in the same way. The purposes for reading such as reading a scientific journal for detail and reading a magazine article for general information, play an important role in the way a reader reads a text (Royer et al, 1984). Third, empirical studies have shown that certain factors and conditions can affect reading comprehension. They include syntactic simplification, background knowledge, reading modes (oral and silent), and the availability or lack of a title when reading a text as well as the availability of a passage when completing a follow-up task. Despite the fact that there are numerous studies on second language reading that imply the influence of certain factors, conditions, and purposes on reading comprehension, thus far, no study has examined the effects of the three reading assignment formats (no assignment, a multiple-choice assignment, and a writing
assignment) on reading comprehension that the present study included.
CHAPTER 3

METHODOLOGY

3.1 Subjects

The subjects involved in this study were 120 international students studying in various fields at The Ohio State University. They consisted of 19 Thai, 19 Korean, 18 Chinese, 16 Taiwanese, 12 Indonesian, 10 Japanese, 10 Indian, 7 Turkish, 4 Malaysian, 3 Pakistan, and 2 Hong Kong students. There were 67 females and 53 males with age ranging from 21 to 35. The subjects' fields of study included science and engineering, education, agriculture, business administration, social work, economics, mathematics, and pharmacy. Their TOEFL scores ranged from 543 to 613 and the length of stay in the United States ranged from 1 to 11 months.

The subjects were divided into two equal groups, resulting in a high proficiency group (n=60) and a low proficiency group (n=60) in terms of English language ability. The high proficiency subjects were those whose most recent TOEFL scores were 579 or higher. The low
proficiency subjects were those whose most recent TOEFL scores were lower than 579. The high proficiency subjects (n=60) were further divided into two groups, one reading the easy text (n=30) and the other reading the difficult text (n=30). The high proficiency subjects reading the easy text (n=30) were then randomly assigned to the three reading assignment formats with equal numbers in each group: no assignment (n=10), a multiple-choice assignment (n=10), and a writing assignment (n=10). The high proficiency subjects who read the difficult text (n=30) were also randomly assigned to the three reading assignment formats with equal numbers in each group: no assignment (n=10), a multiple-choice assignment (n=10), and a writing assignment (n=10).

In the same way, the low proficiency subjects (n=60) were divided into two groups, one reading the easy text (n=30) and the other reading the difficult text (n=30). The low proficiency subjects who read the easy text (n=30) were randomly assigned to the three reading assignment formats: no assignment (n=10), a multiple-choice assignment (n=10), and a writing assignment (n=10). The low proficiency subjects reading the difficult text (n=30) were also randomly assigned to the three reading assignment formats: no assignment (n=10), a multiple-choice assignment (n=10), and a writing assignment (n=10). (See Figure 1 below)
Figure 1: The distribution of subjects in the study.

* NA = No assignment format
  MA = multiple-choice assignment format
  WA = Writing assignment format
3.2 Instruments

Two expository texts were used in this study. One was "Managing Time," a passage taken from *Chains of Light*, which is a textbook for reading in an American secondary school. Another is "Graduate Research Forum," taken from a newsletter that was published by the Council of Graduate Students at The Ohio State University in 1997. Because the subjects were from various fields of study, the topics of the texts were general and non-academic in nature so as to minimize the impact of background knowledge on reading comprehension.

The two texts were then classified as difficult and easy. Text difficulty was determined by the total number of words each text contained, and by the mean length of T-units which are defined as one main clause plus any subordinate clause or non-clausal structure that is attached to or embedded in it (Gaies, 1980). The text that contained more words and larger mean length of T-units was identified as a difficult text and the one that contained fewer words and smaller mean length of T-units was identified as an easy text in this study.

"Graduate Research Forum" had a total of 148 words and a mean length of T-units of 14.70, while "Managing Time" had 145 total words and the mean length of T-units was 7.63. Although the total number of words of the two passages were
similar, the mean length of T-units of "Graduate Research Forum" was larger than that of "Managing Time." The former was, therefore, identified as a difficult text and the latter as an easy text. Another criterion used to determine text difficulty was the independent ratings of three native speakers of English who have taught English as a second language. All of them read both texts and then were asked to point out which of the two they perceived as easier or more difficult based on content and sentence structures of the texts. After reading, all three native speakers of English also identified "Managing Time" as an easy text (see Appendix C) and "Graduate Research Forum" as a difficult text (see Appendix D), thus corroborating the previous identification of the researcher based on the total number of words and the mean length of T-units in each text.

In order to test the subjects' comprehension, two sets of 10 multiple-choice questions were developed, one for the easy text (see Appendix E) and the other for the difficult text (see Appendix F). The tests were valid measurements in the sense that all the multiple-choice items addressed only facts or information that were contained in the texts. For example, question 3 for the difficult text asks how often the research forum is organized; the information that was given explicitly in the text (see Appendix D). The tests were also valid because they
measured what they were supposed to measure, which was reading comprehension (Hatch & Lazaraton, 1991; Henning, 1987). For example, the last question for the easy text asks what suggestion the text makes. To be able to choose the correct answer, the subjects have to understand and be able to make an inference from the text that, as a whole, the text suggests that people should be able to control their time. Finally, the multiple-choice tests were valid because they were used to measure only reading comprehension and the results were used in reference only to the subjects' reading performance, not their academic ability or English language proficiency in general.

In addition to validity issues, the multiple-choice tests were also tested for reliability in a pilot study, using the Kuder Richardson formula 20 (KR-20). The reliability of the tests was found to be considerably high at \( r = .81 \) for the easy text and \( r = .83 \) for the difficult text (see pilot study). The score range for multiple-choice tests was 0 to 10 for both the easy and the difficult texts.

Another measurement of reading comprehension was recall protocol which required the subjects to write whatever they could recall immediately after reading. The written recall protocols were scored, using two scoring templates, one for the easy text (see Appendix G) and the other for the difficult text (see Appendix H). To develop
the recall protocol scoring templates, three trained native
speakers of English were asked to read and divide the two
texts into pausal units, after which they assigned the value
to each unit (Johnson, 1970). Because of the brevity of the
texts used in this study, only three levels were used:
level 1 being the least important and level 3 being the most
important (Bernhardt, 1991). Where disagreements about the
pausal units and the value of each unit occurred, the raters
discussed and compromised. The score range for the easy
text was 0 to 73 while the score range for the difficult
text was 0 to 78.

3.3 Procedures

Data were collected at The Ohio State University
between March and October, 1998. The subjects were not
randomly selected but participated in the study on a
voluntary basis. Several criteria were considered in
selecting the subjects. First, they had to be nonnative
speakers of English. Second, the subjects needed to be
graduate students who had already taken the TOEFL (Test of
English as a Foreign Language) test which is usually one of
the requirements for admission to the graduate school.
Third, they could not have lived in the United States more
than one year, otherwise their most recent TOEFL scores
might not accurately reflect their English proficiency at
the time the data were collected. Finally, they had to be willing to participate in the study.

In order to recruit the subjects, the researcher personally approached the students at The Ohio State University and asked them a few questions to find out if they met the selection criteria. Those who met the criteria were told about the study and what they would have to do, and were asked if they would be willing to participate. Time and place were then arranged for data collection according to the availability and convenience of the subjects. As a result, data had to be collected in groups over a long period of time. Each data collection involved a different number of subjects (ranging from 3 to 10) and occurred in different times and places. The researcher tried to maintain the same testing conditions by allotting the same amount of time for reading the text as well as completing each task and by giving the same directions to the subjects in the three reading assignment formats throughout the long process of collecting data.

Before reading and completing the tasks, the subjects were asked to fill out a background information sheet which contained details relevant to the study such as TOEFL scores and language background (see Appendix A). After that, five envelopes were presented to the subjects, three containing three reading assignment formats (no
assignment, a multiple-choice assignment, and a writing assignment) and two containing easy and difficult texts. Each group of subjects was then randomly assigned to one reading assignment format and either a difficult or an easy text by choosing an appropriate envelope. The researcher wrote the assignment format and text difficulty for each group of subjects on each background information sheet after it was returned. In that way, the three variables under investigation in this study (i.e., reading assignment formats, English language proficiency, and text difficulty) were all recorded on the background information sheet for each subject.

Each group of subjects that was assigned to different reading assignment formats received different directions orally before reading. The subjects in the no assignment format were not told beforehand about any task after reading. Those who were in the multiple-choice format knew from the start that they had to complete a multiple-choice task after reading. And those in the writing format were informed beforehand that they had to write whatever they could recall after completing the reading (see directions in Appendix B). But the subjects in all three reading assignment formats eventually had to perform the same tasks (written recall protocols and a multiple-choice task) for both texts. After reading, they had to do written
recall protocols, followed by a multiple-choice test. (If the order of the tasks was reversed, the subjects might be able to use information from the multiple-choice test to complete the written recall protocols). The subjects were also given the same amount of time for each task regardless of reading assignment formats or text difficulty. Fifteen minutes were given for reading, 15 minutes for written recall protocols, and 10 minutes for a multiple-choice test. The amount of time was arbitrarily allotted for each task and was later found in the pilot study to be acceptable. After the reading, texts were collected so that the subjects did not have access to the texts while they were completing the tasks.

After the data were collected, TOEFL scores of all 120 subjects were arranged from the lowest to the highest in order to identify the median used as a cut off point, separating between high proficiency and low proficiency groups. Since the median was 579, the subjects whose TOEFL scores were lower than 579 were identified as low proficiency and the subjects whose scores were higher than 579 were identified as high proficiency. The scores from the multiple-choice tests and the written recall protocols were then recorded for each subject along with the information about his/her language proficiency, text difficulty, and reading assignment format, all of which were
given numerical labels needed for statistical analysis by computer. Selected descriptions of how the data were recorded are given below.
Selected Descriptions of the Recorded Data

English proficiency: 1 = low
2 = high

Text difficulty: 1 = easy
2 = difficult

Reading assignment formats: 1 = no assignment
2 = multiple-choice assignment
3 = writing assignment

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<th>ScoreW</th>
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*ScoreM = multiple-choice scores
ScoreW = written recall scores
3.4 Data Analysis

This study included three independent variables. The first variable, the reading assignment formats, consisted of three levels: no assignment, a multiple-choice assignment, and a writing assignment. The second variable, second language proficiency, consisted of two levels: high and low proficiency. The third variable, text difficulty, also consisted of two levels: an easy and a difficult text. Two dependent variables were scores from multiple-choice tests (the score range was 0 to 10 for both texts) and scores from written recall protocols (the score range was 0 to 73 for the easy text and 0 to 78 for the difficult text).

Because there were three independent variables and two dependent variables, three-factor multivariate analysis of variance (MANOVA) was used to analyze the data. This statistical procedure enabled testing of main effect for each independent variable as well as interactions among the three independent variables, using the combined multiple-choice and written recall scores. After that univariate analysis of variance (ANOVA) was used to test the effects of the same independent variables and their interactions by analyzing scores from multiple-choice tests and scores from written recall protocols separately. The process of data analysis was performed on the Statistical Analysis System (SAS) computer package. Scores derived from both
measurements of reading comprehension (recall protocols and multiple-choice tests) were entered into a computer to cross tabulate with three reading assignment formats, two levels of language proficiency, and two levels of text difficulty. The computer analysis provided the descriptive statistics of means and standard deviations, and the F-statistics or the overall significant differences for each of the three independent variables including their interactions. Depending on the results, appropriate post-hoc multiple comparison procedures were used to find the minimum distance and identification of significant differences. This procedure specifically indicated which relevant subgroups representing the independent variables differed most conspicuously.

3.5 Pilot Study

A pilot study was conducted to (1) refine experimental procedures, (2) determine appropriate time allotments for the reading as well as completing the multiple-choice and recall tasks, (3) verify the level of text difficulty, and (4) estimate the reliability of the multiple-choice test.

Thirty-six international students studying at The Ohio State University were divided into low and high English proficiency groups, using the median of the subjects' TOEFL
scores. As a result, the subjects whose TOEFL scores were lower than 569 were identified as low proficiency subjects and those whose TOEFL scores were higher than 570 were identified as high proficiency subjects. The subjects in both groups were randomly assigned to the three reading assignment formats and were required to read either the easy text ("Managing Time") or the difficult text ("Graduate Research Forum"). After that they were asked to complete the multiple-choice and recall tasks.

According to the results, the means of the multiple-choice tests for the low proficiency subjects reading the easy text were 6.7, 7.0, and 7.7 for zero assignment, multiple-choice assignment, and writing assignment, respectively, whereas the means for the high proficiency counterparts were 7.3, 8.7, and 9.3 (the possible scores for the easy text ranged from 0 to 10). As for the difficult text, the means for the low proficiency group are 6.0, 6.7, and 7.1 as opposed to 7.3, 8.3, and 9.0 for the high proficiency group (the possible scores for the difficult text ranged from 0 to 10).

Measured by the recall tasks, the low proficiency subjects reading the easy text generated mean scores of 18.6, 30.8, and 41.6, while the high proficiency subjects generated means of 23.8, 33.2, and 47.9 for zero assignment, multiple-choice assignment, and writing assignment,
respectively (the possible scores for the easy text ranged from 0 to 73). When reading the difficult text, the low proficiency group produced means of 17.7, 28.9, and 40.3 as opposed to 20.5, 32.6, and 46.4 produced by the high proficiency group (the possible scores for the difficult text ranged from 0 to 78).

With regard to the two texts used in the study, "Managing Time," which has been classified as the easy text, produced higher scores than the "Graduate Research Forum," which had been classified as the difficult text. The subjects also identified the latter as more difficult than the former, thus further confirming the initial researcher classifications of text difficulty. Time allotments of 15 minutes for reading each text, 15 minutes for written recalls, and 10 minutes for a multiple-choice test were found to be appropriate. Finally, reliability estimates for the multiple-choice tests, using the Kuder Richardson formula 20 (KR-20), for the easy and the difficult texts were $r=.81$ and $r=.83$, respectively.

In summary, the results of the pilot study indicated that reading assignments had an impact on reading comprehension as the writing assignment yielded higher scores than the other two assignments. In addition, language proficiency seems to be a factor in comprehension since high proficiency subjects performed better than low
proficiency subjects across the three reading assignments. Text difficulty was also a factor since the easy text generated higher scores than the difficult text for both high and low proficiency level subjects. Thus, the pilot study was a useful strategy for validating the instruments and improving the procedures of the study.
CHAPTER 4

RESULTS

The present study investigated the effects of different reading assignment formats on second language reading comprehension as well as the effects of their interactions with the level of English proficiency and text difficulty. The first independent variable, reading assignment formats, consisted of 1) no assignment, 2) a multiple-choice assignment, and 3) a writing assignment. The second independent variable, English proficiency, consisted of low proficiency and high proficiency. And the third independent variable, text difficulty, consisted of easy text and difficult text. The two dependent variables were scores from multiple-choice tests and scores from written recall protocols which were used to measure reading comprehension. The data or the dependent variables were analyzed using a computer statistical package (SAS).

The purpose of this chapter is to report the results from the statistical analysis of the data. First, the chapter presents the descriptive statistics, which include
means and standard deviations. Second, inferential statistics are reported; these include multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA), both giving the F-statistics or the test of significance. Finally, post hoc multiple comparison procedures employed to locate significant differences are presented.

4.1 Descriptive statistics

This part of Chapter 4 includes Tables 1 to 8 which contain means and standard deviations of the scores from the multiple-choice tests and written recall protocols for reading assignment formats, English proficiency, text difficulty, and the interactions among the three variables. Table 1 below reports the means and the standard deviations of the scores from the three reading assignment formats. The table includes both the multiple-choice scores (SCORE M) and the scores from the written recall protocols (SCORE W).
<table>
<thead>
<tr>
<th>Scores</th>
<th>Assignments</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>No</td>
<td>6.83</td>
<td>1.69</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.33</td>
<td>1.05</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.60</td>
<td>.96</td>
<td>40</td>
</tr>
<tr>
<td>W</td>
<td>No</td>
<td>22.65</td>
<td>6.17</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>24.90</td>
<td>5.64</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>38.13</td>
<td>9.10</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 1: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for reading assignment formats.

The results in Table 1 show that the subjects in the writing assignment format did better in multiple-choice tests than the subjects in the multiple-choice assignment and the subjects in the no assignment formats (8.60, 8.33, and 6.83, respectively). With regard to written recall protocols, the subjects in the writing assignment format also scored the highest (38.13), followed by the subjects in the multiple-choice assignment (24.90), and the subjects in the no assignment formats (22.65).

Table 2 below reports means and standard deviations for English proficiency level.
<table>
<thead>
<tr>
<th>Scores</th>
<th>Proficiency</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Low</td>
<td>7.20</td>
<td>1.62</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>8.63</td>
<td>.88</td>
<td>60</td>
</tr>
<tr>
<td>W</td>
<td>Low</td>
<td>25.70</td>
<td>7.26</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>31.42</td>
<td>11.24</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 2: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for English proficiency level.

Table 2 presents the means and the standard deviations of the scores according to the English proficiency level of the subjects. The results indicate that high proficiency subjects performed better than low proficiency subjects in both multiple-choice tests (8.63 versus 7.20) and written recall protocols (31.42 versus 25.70).

Table 3 below presents the means and the standard deviations for text difficulty.
<table>
<thead>
<tr>
<th>Scores</th>
<th>Text diff.</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Easy</td>
<td>8.07</td>
<td>1.36</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Difficult</td>
<td>7.77</td>
<td>1.60</td>
<td>60</td>
</tr>
<tr>
<td>W</td>
<td>Easy</td>
<td>28.93</td>
<td>9.88</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Difficult</td>
<td>28.18</td>
<td>9.89</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 3: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for text difficulty.

Table 3 compares the means of the scores derived from the subjects reading easy text as opposed to those reading difficult text. The results indicate that the easy text yielded a slightly higher mean (8.07) than the difficult text (7.77) in multiple-choice tests. However, the means for the easy and the difficult texts (28.93 and 28.18) are almost identical in the written recall protocols, especially considering that the scores could range from 0 to 78.

Table 4 contains means and standard deviations of the interaction between reading assignment formats and English proficiency level.
<table>
<thead>
<tr>
<th>Scores</th>
<th>Prof. Assign.</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Low No</td>
<td>5.50</td>
<td>1.28</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>7.85</td>
<td>1.04</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.25</td>
<td>.91</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>High No</td>
<td>8.15</td>
<td>.75</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.80</td>
<td>.83</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.95</td>
<td>.89</td>
<td>20</td>
</tr>
<tr>
<td>W</td>
<td>Low No</td>
<td>21.35</td>
<td>6.44</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>23.90</td>
<td>5.46</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>31.85</td>
<td>5.42</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>High No</td>
<td>23.95</td>
<td>5.75</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>25.90</td>
<td>5.78</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>44.40</td>
<td>7.61</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 4: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for reading assignment formats by English proficiency level.
The results in Table 4 rank the means of the multiple-choice scores obtained from low proficiency subjects in the writing assignment format as the highest (8.25), followed by low proficiency subjects in the multiple-choice format (7.85), and low proficiency subjects in the no assignment format (5.50). The mean of the multiple-choice scores obtained from high proficiency subjects in the writing assignment format is also the highest (8.95), followed by the mean from high proficiency subjects in the multiple-choice assignment format (8.80), and the mean from high proficiency subjects in the no assignment format (8.15).

Concerning the scores from written recall protocols, low proficiency subjects in the writing assignment format performed better than those in the multiple-choice assignment format and those in the no assignment format (the means are 31.85, 23.90, and 21.35, respectively). As for the high proficiency counterparts, the writing assignment format yielded highest mean, followed by the multiple-choice assignment format, and the no assignment format (44.40, 25.90, and 23.95, respectively).

Table 5 below presents the results of the interaction between reading assignment formats and text difficulty.
<table>
<thead>
<tr>
<th>Scores</th>
<th>Text Assignments</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Easy No</td>
<td>7.15</td>
<td>1.57</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.40</td>
<td>1.05</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.65</td>
<td>.93</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Diff. No</td>
<td>6.50</td>
<td>1.79</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.25</td>
<td>1.07</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.55</td>
<td>.99</td>
<td>20</td>
</tr>
<tr>
<td>W</td>
<td>Easy No</td>
<td>22.75</td>
<td>6.71</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>25.40</td>
<td>5.68</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>38.65</td>
<td>8.55</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Diff. No</td>
<td>22.55</td>
<td>5.75</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>24.40</td>
<td>5.70</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>37.60</td>
<td>9.81</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 5: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for reading assignment formats by text difficulty.
The results in Table 5 show that the interaction between easy text and writing assignment produced higher means than the interaction between easy text and multiple-choice assignment and the interaction between easy text and no assignment for both multiple-choice tests (8.65, 8.40, 7.15, respectively) and written recall protocols (38.65, 25.40, 22.75, respectively). The results are similar for the interaction between difficult text and reading assignment formats. The writing assignment format yielded higher means than the multiple-choice and no assignment formats for both multiple-choice tests (8.55, 8.25, 6.50, respectively) and written recall protocols (37.60, 24.40, 22.55, respectively).

Table 6 below presents the results of the interaction between English proficiency level and text difficulty.
<table>
<thead>
<tr>
<th>Scores</th>
<th>Prof.</th>
<th>Text</th>
<th>M</th>
<th>SD</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Low</td>
<td>Easy</td>
<td>7.40</td>
<td>1.48</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>7.00</td>
<td>1.76</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Easy</td>
<td>8.73</td>
<td>.83</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>8.53</td>
<td>.94</td>
<td>30</td>
</tr>
<tr>
<td>W</td>
<td>Low</td>
<td>Easy</td>
<td>26.57</td>
<td>7.53</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>24.83</td>
<td>7.00</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Easy</td>
<td>31.30</td>
<td>11.42</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>31.53</td>
<td>11.26</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6: Means (M) and standard deviations (SD) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for English proficiency level by text difficulty.

Table 6 reports the interaction between English proficiency level and text difficulty. According to the results, low proficiency subjects reading the easy text did better than low proficiency subjects reading the difficult text in both multiple-choice tests (7.40 versus 7.00) and written recall protocols (26.57 versus 24.83). As for the high proficiency subjects, reading the easy text led to a
higher mean than reading the difficult text in multiple-choice tests (8.73 versus 8.53). But in written recall protocols, high proficiency subjects who read the difficult text performed slightly better than those who read the easy text (31.53 versus 31.30).

Table 7 contains means and standard deviations of only multiple-choice scores from the three way interaction among reading assignment formats, English proficiency level, and text difficulty.
<table>
<thead>
<tr>
<th>Prof.</th>
<th>Text Assign.</th>
<th>M</th>
<th>SD</th>
<th>Ss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Easy No</td>
<td>6.00</td>
<td>1.25</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>7.90</td>
<td>1.10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.30</td>
<td>.95</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Diff.No</td>
<td>5.00</td>
<td>1.15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>7.80</td>
<td>1.03</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.20</td>
<td>.92</td>
<td>10</td>
</tr>
<tr>
<td>High</td>
<td>Easy No</td>
<td>8.30</td>
<td>.82</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.90</td>
<td>.74</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>9.00</td>
<td>.82</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Diff.No</td>
<td>8.00</td>
<td>.67</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>8.70</td>
<td>.95</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>8.90</td>
<td>.99</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 7: Means (M) and standard deviations (SD) of multiple-choice scores for English proficiency level by text difficulty and by reading assignment formats.
Table 7 lists the means and standard deviations of the multiple-choice scores obtained from the three way interaction among the reading assignment formats, English proficiency level, and text difficulty. Concerning low proficiency subjects, the results show that the mean of 8.30 produced by reading the easy text in the writing assignment format is the highest, followed by the mean of 7.90 produced by reading the easy text in the multiple-choice assignment format, and 6.00 by reading the same text in the no assignment format. When reading the difficult text, low proficiency subjects in the writing assignment format also performed better than those in the multiple-choice format and those in the no assignment format (the means are 8.20, 7.80, 5.00, respectively).

With regard to high proficiency subjects, the results are similar to their low proficiency counterparts. Writing assignment yielded a higher mean than multiple-choice and no assignment formats for both easy text (9.00, 8.90, 9.30, respectively) and difficult text (8.90, 8.70, 8.00, respectively).

Table 8 lists means and standard deviations of only written recall scores from the three way interaction among reading assignment formats, English proficiency level, and text difficulty.
<table>
<thead>
<tr>
<th>Prof.</th>
<th>Text Assign.</th>
<th>M</th>
<th>SD</th>
<th>Ss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Easy No</td>
<td>21.60</td>
<td>6.99</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>25.10</td>
<td>6.01</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>33.00</td>
<td>4.69</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Diff. No</td>
<td>21.10</td>
<td>6.21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>22.70</td>
<td>4.85</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>30.70</td>
<td>6.09</td>
<td>10</td>
</tr>
<tr>
<td>High</td>
<td>Easy No</td>
<td>23.90</td>
<td>6.57</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>25.70</td>
<td>5.64</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>44.30</td>
<td>7.85</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Diff. No</td>
<td>24.00</td>
<td>5.16</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Multiple-ch</td>
<td>26.10</td>
<td>6.21</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>44.50</td>
<td>7.78</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 8: Means (M) and standard deviations (SD) of written recall scores for English proficiency level by text difficulty and by reading assignment formats.
Table 8 reports the means and standard deviations of the written recall scores obtained from the three way interaction among the reading assignment formats, English proficiency level, and text difficulty. The results indicate that low proficiency subjects reading the easy text in the writing assignment format (33.00) did better than those in the multiple-choice assignment (25.10) and those in the no assignment formats (21.60). Similarly, when reading the difficult text, low proficiency subjects in the writing assignment format produced a higher mean than the multiple-choice and no assignment formats (30.70, 22.70, and 21.10, respectively).

High proficiency subjects followed the same pattern as their low proficiency counterparts. The writing assignment format continued to yield a higher mean than multiple-choice and no assignment formats for both easy text (44.30, 25.70, and 23.90) and difficult text (44.50, 26.10, and 24.00).
4.2 Inferential statistics: The test of significance

Descriptive statistics in part 1 revealed differences among means of the reading assignment formats, English proficiency level, text difficulty, and their interactions. Further and more complicated statistical analyses were needed to test the significant effects of those independent variables and their interactions on reading comprehension. Because there were two dependent variables (scores from multiple-choice tests and scores from written recall protocols), multivariate analysis of variance (MANOVA) was used to test the overall significance of the combined multiple-choice and written recall scores for each variable, including the two way interactions between two variables and the three way interaction among all three variables (see Table 9). After that univariate analysis of variance (ANOVA) was employed to test the significant effects of multiple-choice scores and written recall scores in separation (see Table 10). In other words, ANOVA was used to examine whether the results were the same or differed according to the types of measurement (multiple-choice tests and written recall protocols).
4.2.1 Multivariate analysis of variance (MANOVA)

Table 9 below presents the results from multivariate analysis of variance (MANOVA) of the combined multiple-choice and written recall scores for reading assignment formats, English proficiency, and text difficulty.

<table>
<thead>
<tr>
<th>Effects</th>
<th>Value</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>.303</td>
<td>43.77</td>
<td>.000*</td>
</tr>
<tr>
<td>Proficiency</td>
<td>.592</td>
<td>36.81</td>
<td>.000*</td>
</tr>
<tr>
<td>Text</td>
<td>.973</td>
<td>1.45</td>
<td>.237</td>
</tr>
<tr>
<td>Assignment*Proficiency</td>
<td>.658</td>
<td>12.47</td>
<td>.000*</td>
</tr>
<tr>
<td>Assignment*Text</td>
<td>.977</td>
<td>0.63</td>
<td>.635</td>
</tr>
<tr>
<td>Proficiency*Text</td>
<td>.992</td>
<td>0.42</td>
<td>.655</td>
</tr>
<tr>
<td>Assignment<em>Proficiency</em>Text</td>
<td>.986</td>
<td>0.39</td>
<td>.816</td>
</tr>
</tbody>
</table>

* p < .05

Table 9: Multivariate analysis of variance (MANOVA) of the combined multiple-choice and written recall scores for reading assignment formats, English proficiency level, and text difficulty.

The results in Table 9 indicate that the main effects of reading assignment formats and English proficiency level are significant at p < .05, but the effect
of text difficulty is not significant. The results also show that the interaction effect between reading assignment formats and English proficiency level is significant, but the interaction between reading assignment formats and text difficulty, the interaction between proficiency level and text difficulty, and the three way interaction among all three variables are not significant.

4.2.2 Univariate analysis of variance (ANOVA)

Table 10 below contains the results from univariate analysis of variance (ANOVA) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for reading assignment formats, English proficiency level, and text difficulty.
<table>
<thead>
<tr>
<th>Source</th>
<th>Scor df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>M 2</td>
<td>36.51</td>
<td>39.35</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>W 2</td>
<td>2796.26</td>
<td>71.61</td>
<td>.000*</td>
</tr>
<tr>
<td>Proficiency</td>
<td>M 1</td>
<td>61.63</td>
<td>66.43</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>W 1</td>
<td>980.41</td>
<td>25.11</td>
<td>.000*</td>
</tr>
<tr>
<td>Text</td>
<td>M 1</td>
<td>2.70</td>
<td>2.91</td>
<td>.091</td>
</tr>
<tr>
<td></td>
<td>W 1</td>
<td>16.88</td>
<td>.43</td>
<td>.512</td>
</tr>
<tr>
<td>Assign*Prof</td>
<td>M 2</td>
<td>11.26</td>
<td>12.13</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>W 2</td>
<td>351.11</td>
<td>8.99</td>
<td>.000*</td>
</tr>
<tr>
<td>Assign*Text</td>
<td>M 2</td>
<td>.93</td>
<td>.99</td>
<td>.372</td>
</tr>
<tr>
<td></td>
<td>W 2</td>
<td>2.28</td>
<td>.06</td>
<td>.943</td>
</tr>
</tbody>
</table>

Table 10: Univariate analysis of variance (ANOVA) of multiple-choice scores (ScoreM) and written recall scores (ScoreW) for reading assignment formats, English proficiency, and text difficulty.
Table 10 (continued)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>1</th>
<th>.30</th>
<th>.32</th>
<th>.571</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W</td>
<td>1</td>
<td>29.01</td>
<td>.74</td>
<td>.391</td>
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</tbody>
</table>

<table>
<thead>
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<th></th>
<th>M</th>
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<th>.47</th>
<th>.51</th>
<th>.601</th>
</tr>
</thead>
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<td></td>
<td>W</td>
<td>2</td>
<td>3.56</td>
<td>.09</td>
<td>.913</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>108</th>
<th>.93</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W</td>
<td>108</td>
<td>39.05</td>
</tr>
</tbody>
</table>

*p < .05

Table 10 compares the results from univariate analysis of variance of reading comprehension measured by multiple-choice tests (Score M) and the results from univariate analysis of variance of reading comprehension measured by written recall protocols (Score W). The comparison shows that the two types of measurement produced the same results. Reading assignment formats, English proficiency, and the interaction between reading assignment formats and English proficiency are found to be significant. But text difficulty, the interactions between assignment and
text difficulty, between English proficiency and text difficulty, and the three way interaction among all three variables are not significant. These results are consistent with the results from multivariate analysis of variance presented in Table 9.

4.3 Post hoc tests: Locating the significant differences

The inferential statistics of MANOVA and ANOVA revealed significant effects of certain variables on reading comprehension. A follow-up procedure was needed to identify the significant differences between means. Because English proficiency has only two levels or two subgroups (low and high), and because high proficiency subjects, as a whole, produced a higher mean than low proficiency subjects, the conclusion can be made from statistical significance that high proficiency subjects did perform significantly better than low proficiency subjects. In other words, proficiency level in English has an effect on reading comprehension.

However, that is not the case with reading assignment formats which were also found to be significant. Because there were three assignment formats, a post hoc multiple comparison procedure was needed to identify the formats that differed significantly. Table 11 below presents the results of Tukey's test of multiple comparisons.
for both multiple-choice (Score M) and written recall scores (Score W).

<table>
<thead>
<tr>
<th>Score</th>
<th>Assign</th>
<th>Assign</th>
<th>Mean Difference</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>No</td>
<td>Mul-ch</td>
<td>-1.50</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Writing</td>
<td>-1.78</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Mul-ch</td>
<td>Writing</td>
<td>-.28</td>
<td>.411</td>
</tr>
<tr>
<td>W</td>
<td>No</td>
<td>Mul-ch</td>
<td>-2.25</td>
<td>.246</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Writing</td>
<td>-15.48</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>Mul-ch</td>
<td>Writing</td>
<td>-13.23</td>
<td>.000*</td>
</tr>
</tbody>
</table>

*p < .05

Table 11: Multiple comparisons for reading assignment formats according to multiple-choice scores (Score M) and written recall scores (Score W).

With regard to the multiple-choice scores, the results of multiple comparisons in Table 11 revealed that there are significant differences between no assignment and multiple-choice assignment formats, and also between no assignment and writing assignment formats. But the
multiple-choice assignment format was not found to be significantly different from the writing assignment format.

Considering the written recall scores, the results indicated that there was no significant difference between no assignment and multiple-choice assignment formats. But significant differences were found between no assignment and writing assignment, and also between multiple-choice and writing assignment formats.

Another significant effect found in the study was the interaction between reading assignment formats and English proficiency (see Table 9 and Table 10). Multiple comparisons were needed because six comparisons had to be made. They were the comparisons between 1) low proficiency with no assignment and low proficiency with multiple-choice assignment, 2) low proficiency with no assignment and low proficiency with writing assignment, 3) low proficiency with multiple-choice assignment and low proficiency with writing assignment, 4) high proficiency with no assignment and high proficiency with multiple-choice assignment, 5) high proficiency with no assignment and high proficiency with writing assignment, and 6) high proficiency with multiple-choice assignment and high proficiency with writing assignment.

In order to make the multiple comparisons mentioned above, the means obtained from the interaction between
reading assignment formats and English proficiency (see Table 4) had to be plotted on the graphs. For this study, two graphic representations were needed in order to display the means from multiple-choice tests (see Figure 1) and the means from written recall protocols (see Figure 2). In order to find out which interaction produced a better performance in each comparison, the minimum distance for significant differences between means was calculated, one for the means from multiple-choice tests and another for the means from written recall protocols. Since only six comparisons were to be made, Dunn's test was used to find the difference between means needed for significance (see Kennedy & Bush, 1985). The minimum distance needed for significance was found to be 1.15 for multiple-choice tests and 7.49 for written recall protocols. Figure 2 below is the graphic representation of the interaction between reading assignment formats and English proficiency according to the means from multiple-choice tests.
Figure 2: A graphic representation of the interaction between reading assignment formats and English proficiency according to the scores from multiple-choice tests.
In Figure 2, reading assignment formats were plotted as the face variable because they were of primary interest in this study (see Kennedy & Bush, 1985). The minimum distance of 1.15 needed for significance between the means from multiple-choice tests revealed that the performance between the low proficiency subjects in multiple-choice and writing assignment formats was not significantly different, but both did significantly better than the low proficiency subjects in no assignment format. With regard to high proficiency subjects, different reading assignment formats did not appear to produce any significant differences even though writing assignment yielded higher mean than multiple-choice and no assignment formats.

Figure 3 below is a graph portraying the interaction between reading assignment formats and English proficiency according to the means from written recall protocols.
Figure 3: A graphic representation of the interaction between reading assignment formats and English proficiency according to the scores from written recall protocols.
Similar to Figure 2, reading assignment formats were plotted as the face variable in Figure 3. The minimum distance of 7.49 needed for significance between the means from written recall protocols revealed that the performance between the low proficiency subjects in the no assignment and multiple-choice assignment formats was not significantly different, but both of them scored significantly lower than the low proficiency subjects in the writing assignment format. As for the high proficiency subjects, reading assignment formats were found to produce the same significant results as their low proficiency counterparts.

Out of seven effects which are under investigation in this study, two main effects (reading assignment formats and English proficiency) and one interaction effect (the interaction between reading assignment formats and English proficiency) were found to be significant. These results will be summarized in the form of responses to the research questions and will be discussed extensively in Chapter 5.
CHAPTER 5

SUMMARY, DISCUSSION, AND CONCLUSION

This chapter is divided into two parts. The first part presents a summary of the results. The second part is a description which includes a discussion of the findings, pedagogical implications, limitations of the study, recommendations for further study, and conclusion.

5.1 Summary of the results

Analysis of the data in Chapter 4 revealed both significant and non-significant effects of variables under investigation in the present study. The results can be summarized in response to the research questions posted in Chapter 1 as follows:

Research question 1. Is there a significant difference in reading comprehension among three reading assignment formats as measured by multiple-choice tests and written recall protocols?
Yes. The effects of reading assignment formats on reading comprehension were found to be significant for both the multiple-choice tests and the written recall protocols. The results showed that the writing assignment format yielded the highest mean, followed by the multiple-choice and no assignment formats. These results were consistent for multiple-choice tests as well as written recall protocols. Multivariate analysis of variance (MANOVA) indicated the significant effects of reading assignment formats on reading comprehension. Univariate analysis of variance (ANOVA) revealed the significant effects for both multiple-choice tests and written recall protocols. The post hoc procedure for multiple comparisons between the means from multiple-choice tests revealed no significant differences between multiple-choice and writing assignment formats, but the two were significantly better than no assignment format. With regard to the means from written recall protocols, the writing assignment format was found to yield higher scores than the other two (38.13 versus 24.90 and 22.65). But the comparison between the multiple-choice and no assignment formats did not reveal any significant differences.
Research question 2. Is there a significant difference in reading comprehension between low and high English proficiency subjects as measured by multiple-choice tests and written recall protocols?

Yes. The effect of English proficiency on reading comprehension was found to be significant for both the multiple-choice tests and the written recall protocols. The results showed that high proficiency subjects produced a higher mean than low proficiency subjects in multiple-choice tests (8.63 versus 7.20) and also in written recall protocols (31.42 versus 25.70). Multivariate analysis of variance (MANOVA) indicated the significant effects of English proficiency on second language reading comprehension and univariate analysis of variance (ANOVA) revealed similar results for both multiple-choice tests and written recall protocols. Since there was only one comparison between the means of low and high proficiency, multiple comparisons were not needed to locate the significant differences. In short, high proficiency subjects were found to perform significantly better than low proficiency subjects in multiple-choice tests and written recall protocols.
Research question 3. Is there a significant difference in reading comprehension between easy and difficult texts as measured by multiple-choice tests and written recall protocols?

No. The effect of text difficulty on reading comprehension was not found to be significant for both the multiple-choice tests and the written recall protocols. The results showed that the easy text yielded a higher mean than the difficult text in both measurements of reading comprehension. However, the difference between means was only .30 for multiple-choice tests and .75 for written recall protocols (see Table 3). Further analysis using multivariate analysis of variance (MANOVA) indicated that the effects of text difficulty on reading comprehension were not significant. Univariate analysis of variance (ANOVA) revealed non-significant effects for both multiple-choice tests and written recall protocols. Post hoc tests were not performed because the effects of text difficulty were not significant.

Research question 4. Is there a significant difference in reading comprehension for the interaction between reading assignment formats and English proficiency as measured by multiple-choice tests and written recall protocols?
Yes. The interaction between reading assignment formats and English proficiency was found to have a significant effect on reading comprehension for both the multiple-choice tests and the written recall protocols. The results showed that high proficiency subjects produced higher means than low proficiency subjects across all three reading assignment formats in multiple-choice tests as well as written recall protocols. Multivariate analysis of variance (MANOVA) indicated the significant effects of the interaction between English proficiency and reading assignment formats on reading comprehension. Univariate analysis of variance (ANOVA) revealed similar results for both multiple-choice tests and written recall protocols. Because six comparisons between means were needed for each measurement, a post hoc procedure for multiple comparisons was used to locate significant differences. The results showed that low proficiency subjects in multiple-choice and writing assignment formats did better than those in no assignment format, but reading assignments did not produce significant effects for high proficiency subjects in multiple-choice tests (see Figure 2). In written recall protocols, however, the writing assignment format outperformed the multiple-choice and no assignment formats for both low and high proficiency subjects while the other
two assignment formats were not significantly different (see Figure 3).

Research question 5. Is there a significant difference in reading comprehension for the interaction between reading assignment formats and text difficulty as measured by multiple-choice tests and written recall protocols?

No. The interaction between the reading assignment formats and the text difficulty was not found to have a significant effect on reading comprehension for both the multiple-choice tests and the written recall protocols. The results showed that the easy text yielded higher means than the difficult text across the reading assignment formats for both measurements of reading comprehension. However, the differences between means were small, ranging from .10 to .65 for multiple-choice tests and .10 to 1.05 for written recall protocols (see Table 5). Multivariate analysis of variance (MANOVA) revealed no significant effects of the interaction between reading assignment formats and text difficulty on reading comprehension. Univariate analysis of variance corroborated the results for multiple-choice tests as well as written recall protocols. Post hoc procedure for multiple comparisons were not performed because the effects
of the interaction between the two variables were not significant.

Research question 6. Is there a significant difference in reading comprehension for the interaction between English proficiency and text difficulty as measured by multiple-choice tests and written recall protocols?

No. The interaction between English proficiency and text difficulty was not found to have a significant effect on reading comprehension for both the multiple-choice tests and the written recall protocols. The results showed that the easy text yielded a higher mean than the difficult text in multiple-choice tests, but the difference between means was only .40 for low proficiency subjects and .20 for high proficiency subjects. In written recall protocols, low proficiency subjects who read the easy text produced a higher mean than those who read the difficult text, but the difference between means was only 1.74. The results for high proficiency subjects, however, were reversed, as those who read the difficult text scored .20 higher than those who read the easy text (see Table 6). Multivariate analysis of variance (MANOVA) revealed no significant effects of the interaction between English proficiency and text difficulty on reading comprehension. Univariate analysis of variance (ANOVA) revealed non-significant effects for both multiple-
choice tests and written recall protocols. A follow-up or post hoc procedure was not needed since the effects of the interaction between the two variables were not significant.

Research question 7. Is there a significant difference in reading comprehension for the interaction among reading assignment formats, English proficiency, and text difficulty as measured by multiple-choice tests and written recall protocols?

No. The interaction among reading assignment formats, English proficiency, and text difficulty was not found to have a significant effect on reading comprehension as measured by the multiple-choice tests and the written recall protocols. The results showed that the easy text yielded higher means than the difficult text across the reading assignment formats for both low and high proficiency subjects in multiple-choice tests, but the differences between means were minimal. For example, low proficiency subjects in the multiple-choice format who read the difficult text scored only .10 lower than those in the same format who read the easy text (see Table 7). In written recall protocols, the easy text also yielded higher means than the difficult text across the reading assignment formats for low proficiency subjects. However, the results were reverse for high proficiency subjects as those who read
the difficult text performed slightly better than those who read the easy text across the reading assignment formats (see Table 8). Multivariate analysis of variance (MANOVA) revealed no significant effects of the interaction among reading assignment formats, English proficiency, and text difficulty on reading comprehension. Univariate analysis of variance (ANOVA) revealed similar results for both multiple-choice tests and written recall protocols. Post hoc tests were not needed since the effects of the interaction were not significant.

5.2 Discussion

This part of the chapter discusses the results of the study, including the significant effects of reading assignment formats, and English proficiency, and the interaction between reading assignment formats and English proficiency. Though text difficulty was not found to be significant, certain issues will be explored to help explain this unexpected finding. After that, some observations will be made with regard to the measurements of reading comprehension; multiple-choice tests and written recall protocols. The findings from the present study are subsequently discussed in terms of pedagogical implications. The chapter ends with limitations of the study, recommendations for further study, and conclusion.
Reading assignment formats

This study is based on the literature on cognitive and social views of reading (Hayes, 1989; Bernhardt, 1991) which indicates that the process and products of reading are not always the same, but are affected or determined by several factors. It was posited, therefore, that different reading assignment formats should be a factor that leads to different processes of reading and, as a result, reading comprehension should vary across the reading assignment formats. The significant effects found in this study confirmed that reading assignment formats played an important role and that different formats affected reading comprehension in a different way.

The results of the study, in general, highlighted the importance of direction and purpose for reading in English as a second Language. Eskey (1986), after reviewing the literature on reading, stated that readers read for different purposes and those purposes affect what is attended to and with what intensity. It was argued in this study that reading assignments would help provide directions and sense of purpose for reading as opposed to no assignment, and that different purposes provided by different formats would lead to varying reading performance. The importance of direction and purpose for reading was well reflected by the results that the subjects in the multiple-
choice assignment format, who were told that they had to do a multiple-choice task after reading, did very well in the multiple-choice tests, and the subjects in the writing assignment format, who were informed at the start about a writing task after reading, delivered the best performance in the written recall protocols. On the contrary, the no assignment format, which did not provide any direction or purpose of reading for the subjects, yielded the lowest scores in both the multiple-choice tests and the written recall protocols.

The results which showed that different reading assignment formats yielded different reading comprehension scores also reflect the notion of reading in different ways for different purposes. Nuttall (1982), among others, stated that readers have a variety of reasons for reading, and that the way readers tackle the task is strongly influenced by their purpose for reading. A possible explanation for the subjects producing the lowest scores in the no assignment format is that they did not have any direction or purpose for reading. Another explanation is that they did not know what, if anything, to expect after reading. As a result, they might have just skimmed the texts or might not have paid much attention to content and details. In other words, they were reading in a different way from the subjects in the multiple-choice assignment
format, who might have paid more attention to what they perceived as important details, and the subjects in the writing assignment format, who might have paid special attention to syntactic structures and/or content details that would be easy to recall in written recall protocols. That could be the reason why the subjects in the multiple-choice assignment format, who might have read the text in a certain way for the purpose of doing a multiple-choice task, did very well in the multiple-choice tests, but did not perform as well in the written recall protocols as the subjects in the writing assignment format who might have read the text in another way for the purpose of completing a writing task. In short, different reading assignment formats might have led to different approaches or different ways of reading texts, thus resulting in different levels of reading performance.

In addition, the results of the study seemed to reflect the theory stating that reading and writing are connected and enhance each other. In this respect, Spivey (1990) claimed that writing can influence the reading process and Leki (1993) argued that writing provides a real purpose for reading. The theory that reading and writing are related and that the reading-writing connection should help increase reading comprehension seemed to be supported. The results showed that the subjects in the writing
assignment format performed the best in the written recall protocols. Although they were not told that they had to complete a multiple-choice task, they still did significantly better in the multiple-choice tests than those in the no assignment format and slightly better than those in the multiple-choice assignment format. Thus, the sequence of reading and writing or the reading-writing connection proved to be beneficial to the subjects in terms of reading comprehension.

As a whole, the results showed that the writing assignment format produced the highest level of performance, followed by the multiple-choice and then the no assignment formats. These findings seem to suggest that there might be a hierarchical order of assignment formats in reading English as a second language in terms of reading performance. In other words, some assignments may lead to better performance than others. However, more studies involving other reading assignment formats are needed before such a conclusion can be made.

**English proficiency**

The results indicated that high proficiency subjects performed significantly better than low proficiency subjects. These results did not shed any new light on second language reading comprehension, but rather
corroborated the findings from previous studies (e.g., Barnett, 1986; Bernhardt, 1986; Clarke, 1979; Cziko, 1980; Perkins, 1983) that language proficiency plays an important role in reading performance. The focus of this study, however, was on the effect of the interaction between English proficiency and other variables on reading comprehension.

The interaction between reading assignment formats and English proficiency

The interaction between reading assignment formats and English proficiency was found to have a significant effect on reading comprehension. Multiple comparisons used to identify significant differences between means obtained from the multiple-choice tests revealed that the difference between means of the low proficiency subjects in the writing assignment format (8.25) and low proficiency subjects in the multiple-choice assignment format (7.85) was not significant. However, both means were significantly higher than the mean for low proficiency subjects in the no assignment format (5.50). These results indicate that some forms of reading assignments helped to improve reading performance of the low proficiency subjects. On the contrary, reading assignments did not appear to affect reading performance of the high proficiency subjects.
Though the no assignment format yielded the lowest mean, the differences between means for all three formats were not found to be significant.

To put it in another way, reading assignment formats were very important for low proficiency subjects, but not as important for their high proficiency counterparts. These results seem to suggest that second language proficiency and reading ability in that language are correlated or reflect each other. In fact, language proficiency might be the key element for reading comprehension, overriding the impact of other factors which, in this case, were reading assignments. As a result, different reading assignment formats did not lead to significant differences for high proficiency subjects doing multiple-choice tests. On the other hand, subjects not highly proficient in English were positively affected by reading assignments (versus no assignment) which might have provided them with guidelines or purposes for reading.

The multiple-choice assignment format which significantly improved the performance of low proficiency subjects in the multiple-choice tests became almost a non-factor in the written recall protocols, where there was only a slightly higher mean than the no assignment format. As for high proficiency subjects, reading assignment formats that did not yield significant differences in the multiple-
choice tests became a factor in the written recall protocols as those who were informed about writing assignment outperformed those who were not informed (see Figure 2). A possible explanation is that multiple-choice tests and written recall protocols called for different cognitive processes, different strategies, or different approaches to the text. While the former involved choosing correct answers, the latter was a more complicated task that required the subjects to reproduce a text, a process which involved not only reading but also writing skills. Even if the subjects understood the text, not being informed about the writing assignment until after reading the text could affect their performance in a negative way, regardless of language proficiency level.

Finally, the lowest scores occurring within the no assignment format in both multiple-choice tests and written recall protocols, regardless of English proficiency level might be caused by a lack of effort and attention. Since the subjects in the no assignment format were not told about and might not have expected to do any task after reading, they might not have put in as much effort or paid as much attention to the text as those who knew beforehand that they had to do an assignment after reading. This might be reflected in the manner and the time the subjects spent on reading the text. Though everyone was given 15 minutes, it
was observed that the subjects in the different assignment formats spent different amounts of time and read the text in different manners. Most of the subjects in the no assignment format, both low and high proficiency, appeared to read quickly or only once and waited for the time to expire. Those in the multiple-choice format seemed to read more slowly and spent almost all of the 15 minutes reading the text for the second or third time. The subjects in the writing format appeared to fix their eyes longer on some sentences and continued reading back and forth even after the time expired. In short, different reading assignment formats might have generated different degrees of effort and attention that resulted in different reading comprehension scores, ranking the writing format at the top, followed by the multiple-choice and the no assignment formats.

**Text difficulty**

The results showed that the easy text did not yield significantly higher scores than the difficult text. Overall, the difference between means of the two texts was only .30 in multiple-choice tests and only .75 in written recall protocols (see Table 3). The results were found to be the same for low proficiency as well as high proficiency subjects and also across the three reading assignment formats. In one instance, the interaction between English
proficiency and text difficulty revealed that high proficiency subjects who read the difficult text even did slightly better than high proficiency subjects who read the easy text (see Table 6). In short, text difficulty was not found to be a contributing factor in the subjects' reading comprehension, regardless of English proficiency level or reading assignment formats. These findings might be caused by certain factors such as those listed below.

First of all, the classification of text difficulty in this study might not be effective. This could occur as a result of inadequate criteria used to identify easy and difficult texts which were based mostly on syntactic structures such as total number of words, total number of T-units, and the mean length of T-units. Other factors, especially content of the text, might have played an important role in reading comprehension. In this case, the subjects, who were all graduate students, might have been highly motivated by the content of the difficult text, which was about a graduate research forum or might have found the content academically relevant and practical. As a result, the subjects who read the difficult text might have used more effort or paid more attention than those who read the easy text. In short, other factors such as content, motivation, and interest may override or reduce the degree of difficulty, pending the effort and attention the readers
bring to the text. Second, "Graduate Research Forum" was identified as more difficult than "Managing Time" by the native speakers of English. This might not be true for a diverse group of nonnative speakers who might have approached and processed the texts differently according to their cultures, first language background, and fields of study. Thus, the text identified as difficult by the native speakers might not be difficult, and the text identified as easy might not necessarily be easy for some subjects. In fact, 5 out of 10 nonnative speakers of English who were asked to read both texts after the experiment said that "Managing Time" was more difficult than "Graduate Research Forum." They explained that the content of the former required comparisons and imagination concerning imagined time and real time (see Appendix C), while certain parts of the latter, for example, the prizes of $300, $200, and $100 for first, second, and third places, could be easily memorized (see Appendix D).

Third, the article about graduate research forum used in this study has been published every year in the graduate students newsletter, "Voice", which has been distributed across the campus. It is possible that some subjects might have read this text or heard about the research forum before participating in this study. If that is the case, those subjects might have been able to
understand the "Graduate Research Forum" that was identified as the difficult text better than "Managing Time" which was identified as the easy text, due to familiarity with the content. This issue was discussed extensively by Johnson (1981) and later by Carrell (1987) who found in their studies that content schemata, defined as familiarity with or prior knowledge about the content, affected reading comprehension to a greater extent than formal schemata which was defined as knowledge about rhetorical and organizational structures of the text.

Finally, the non-significant effect of text difficulty may suggest the existence of a continuum, with the easiest text at one end and the most difficult text at the other. The degree of difficulty for texts used in the study might be about the same on the continuum, or the distance between them might not be adequate to produce a significant effect on reading comprehension. More studies are obviously needed before such conclusion can be made.

**Multiple-choice tests and written recall protocols**

Two reading assessments were used in this study. Some researchers have argued that different assessments have different strengths and weaknesses and that language performance may differ according to the type of measurement. Multiple procedures have, therefore, been recommended for
testing reading comprehension (Bernhardt, 1991; Shohamy, 1984; Spolsky, 1989).

Though multiple-choice tests and written recall protocols produced essentially the same results, it was observed that the subjects scored higher in multiple-choice tests, with the scores ranging from 5 to 10 (the possible score range was 0 to 10) than in written recall protocols, with the score ranging from 12 to 49 (the possible score range was 0 to 78). One explanation is that the subjects were more familiar with the multiple-choice format which is commonly used in the classroom than with the less common written recall protocols. In fact, when the subjects were told to complete a multiple-choice test, they seemed to have a clear understanding of the task and proceeded with confidence. When they were told what they had to write, most of the subjects seemed to be confused. That could also be the reason why the subjects in the writing assignment format, who knew what they had to do after the reading, were still able to produce an overall mean of only 38.12 in written recall protocols (see Table 1).

In addition to unfamiliarity with the testing format, poor writing skills might also be a factor responsible for the low scores from the written recall protocols. It should be mentioned that all the subjects involved in this study were international students who were
nnonnative speakers of English. Some subjects may have come from places where writing in English is not a common practice either in academic or non-academic settings. Other subjects may have come from a society where writing, especially in second language, is not perceived as important as other language skills, especially reading. This issue is well supported by Brandt (1994) who claimed that people usually regard reading as prestigious and more important than writing. Though reading and writing have been related to each other, more time and resources seemed to be spent on reading than writing (p. 473).

5.3 Pedagogical implications

The results from this study have several implications for reading instruction, particularly the practices in English as a second language (ESL) classrooms to improve reading performance of the students. Pedagogical implications based on the results of the study are discussed below.

1. The findings that the subjects in the no assignment format (who were not informed about what they had to do after reading) had the lowest scores in both multiple-choice tests and written recall protocols reflect the important role of purpose for reading in reading performance. This implies that reading should not be
perceived or used as a final activity without any follow-up tasks. In other words, instructors should not just ask students to read something without providing any guidelines or purposes for reading. This is particularly important in an academic setting where some forms of assessment of students' performance are usually expected after reading.

2. The results showed that the subjects in the multiple-choice assignment format (who were told that they had to do a multiple-choice task) did very well in multiple-choice tests and the subjects in the writing assignment format (who were told beforehand about a writing task) produced the highest score in written recall protocols. It may be inferred from these results that the match between instruction or expectations and assessment plays an important role in reading performance. While instructors should make the expectations known to the students during the course of instruction, they should also use assessments that are compatible with expectations and instructional methods. In cases where teaching and testing are separate duties, instructors and evaluators should work together to ensure that students are tested on what they have been taught.

3. It was found in this study that different reading assignment formats had different degrees of impact on low proficiency and high proficiency subjects in terms of
reading performance. For example, the low proficiency subjects performed poorly without any reading assignments, but improved significantly with assignments. In an academic setting where the students with the similar levels of language proficiency are placed in the same classrooms, instructors should have a knowledge of their students' level of proficiency. Unlike instructors who teach a high proficiency class, those who teach a low proficiency class may have to pay special attention to reading activities, such as making sure that some guidelines or some form of assignments are always attached to the text. The point is that appropriate instructional methods and activities have to be used based on the level of proficiency of the students.

4. Although the subjects in the writing assignment format were not told about a multiple-choice task, they were found to yield the best performance in both written recall protocols and multiple-choice tests, thus indicating that reading and writing was an effective combination for improving students' reading comprehension. In general, the finding suggests that the language skills are interrelated and connected and thus should not be taught in isolation. Based on the results of this study, instructors should incorporate reading into writing classes, and writing into reading classes. In addition, besides instructors, those
who are involved in syllabus design should also develop
courses based on these relationships.

5. Easy and difficult texts were found to produce
similar scores (see Table 3). In fact, the interaction
between English proficiency and text difficulty revealed
that high proficiency subjects who read the difficult text
performed slightly better in written recall protocols than
those who read the easy text (see Table 6). It was
explained earlier in this chapter that the subjects might
have found the content of the difficult text relevant or
appealing and, consequently, might have put in more effort
or paid more attention than those who read the easy text.
Since that is the case, instructors should select texts
carefully. They should not only consider grammar and
syntactic structures, but should also pay special attention
to the content when choosing a text for the students to
read. While an interesting topic or content can motivate
students and help improve their reading performance, an
inappropriate topic could cause them to gradually lose
interest in reading. Instructors can find out what kind of
text would interest the students, for example, by asking
them what they want to read about.

6. The subjects, as a whole, scored much higher in
multiple-choice tests than in written recall protocols
across all three assignment formats. It was hypothesized
that the subjects, who were all nonnative speakers of English, might not have good writing ability in English, especially low proficiency subjects who scored much lower in written recall protocols than their high proficiency counterparts. The finding suggests that the use of written recall protocols may not accurately measure reading comprehension of low proficiency L2 learners. The finding also suggests that in English as a second language classrooms where students come from different places and embrace different values about language skills, particularly writing, instructors may need to obtain some information about the writing ability of the students. Based on that information, appropriate writing assignments can be used as a tool to help improve writing skills, which can help to improve reading performance, especially when writing is part of a reading comprehension assessment.

5.4 Limitations of the study

This study was designed and carried out to meet its stated purpose. However, there were certain limitations. First, the subjects involved in the study were not randomly selected but participated on a voluntary basis. Generalizations of the results, therefore, cannot be made. Second, the study used only expository texts (descriptive, non-literary texts) and any findings may not apply to other
text types. Third, multiple-choice tests and written recall protocols were used to measure reading comprehension. The results should not be extrapolated to other types of measurement or assessment. Fourth, the subjects' efforts in reading and completing the study tasks did not occur as part of the students' regular lessons in their classrooms. Finally, the TOEFL scores were self-reported data and may have included errors in the reporting.

5.5 Recommendations for further study

Research involving the reading assignment formats which were under investigation in the present study was not found in the professional literature. Such research might or might not have been conducted, but it was not reported. Studies investigating the same reading assignment formats or other formats are needed in order to corroborate or question the results of this study, and to help provide more related information about reading English as a second language. It will also be useful if other studies along these lines assign the same subjects to multiple reading assignment formats and investigate how differently each subject approaches the texts and what strategies the same subjects use with different formats. That type of study could use different methods of data collection such as interviews, participant observations, or think aloud protocols.
Another important issue that researchers could focus on is text difficulty. Further study is recommended to investigate other criteria for identifying the difficulty of a reading text. Content familiarity should be taken into account while related factors such as task difficulty, text genre, and the length of texts also need to be studied.

Concerning English proficiency, multiple criteria should be used to divide subjects into different proficiency groups. If TOEFL scores were to be used in future studies, scores from particular sub-tests such as the reading section and test of written English (TWE) should be obtained and used in determining the subjects' level of English proficiency as well as interpreting the results. Finally, this study focused on the effects of three variables (reading assignment formats, English proficiency, and text difficulty) and their interactions for adult ESL students in an academic setting. Further research involving other variables, populations, materials, and measurements is needed for a deeper understanding of the second language reading process.
5.6 Conclusion

This study investigated the effects of three reading assignment formats, English language proficiency, text difficulty, and their interactions on second language reading comprehension. Based on statistical analyses, the results obtained in the study include both significant and non-significant effects. Although it has focused on the impact of three selected variables on the subjects' reading comprehension of the texts, the study has contributed to the field of second language acquisition in several ways. First, research involving all three reading assignment formats under investigation in this study was not found in the professional literature. The findings from the study, therefore, have added new information, advanced knowledge, and identified a line of research in the area of second language reading. Second, the particular finding that the writing assignment format yielded the highest performance in reading comprehension of the studied formats has strengthened the need for reading-writing connection, thus encouraging the integrated instruction of the two language skills. Third, the finding that high proficiency subjects outperformed low proficiency subjects, regardless of any of the three reading assignment formats studied, has confirmed the results from previous studies which suggested that second language proficiency is a key factor in second
language reading performance. Fourth, the non-significant effect of text difficulty found in this study has raised an important question about the definition and classification of an easy versus a difficult reading text. More studies should focus on establishing valid and reliable criteria for identifying reading text difficulty. Also, special attention should be given to text selection for both classroom instruction and research because what is difficult for some students to read may not necessarily be so for others. Finally, this study showed that the selection of a reading comprehension assessment format is crucial for second language learners. While a certain type of assessment is appropriate for a certain level of language proficiency, it might not accurately measure reading comprehension of those at a different proficiency level.

The significant effects of reading assignment formats found in this study support the notion that second language reading is a multifaceted process which involves and can be affected by numerous factors and conditions. Therefore, the research on this topic should not cease so new knowledge can be discovered about the reading process. Researchers, instructors, students, and all those involved in the second language need deeper insights into the complex process of reading in a second language. Further study of the interaction of text processing by second language
learners at various levels of language proficiency are sorely needed. This present study has been a good start.
BIBLIOGRAPHY


Rader, K.E. (1990). The effects of three different levels of word rate on the listening comprehension of third-quarter University Spanish students. Doctoral dissertation. The Ohio State University.


APPENDIX A

Background Information Sheet
Background information

Nationality ________________________________
Age __________ Gender _______________________
Field of study ______________________________
Most recent TOEFL score _______________________

I have been in the United States for ______________ months.

My reading ability in first language is (circle)
   below average  average  good  very good

I like __________________ more than ______________ in English.
   (reading, writing)
I spend more time ______________ than __________ in English.
   (writing, reading)
APPENDIX B

Directions for Reading Assignment Formats
1. **Direction for no assignment groups**

    "Please read the passage I just handed out. You can read as many times as you want within 15 minutes."
    Collect texts and distribute a blank piece of paper.
    "Please write down whatever you can remember from the passage. You have 15 minutes."
    Distribute multiple-choice questions.
    "Please choose the correct answers and write down only question numbers with corresponding answers (a, b, c, or d) below your written recalls. You have 10 minutes."
    Collect all the papers.

2. **Direction for multiple-choice assignment groups**

    "Please read the passage I just handed out. You can read as many times as you want within 15 minutes. After reading, you will have to complete a multiple-choice task."
    Collect texts and distribute a blank piece of paper.
    "Please write down whatever you can remember from the passage. You have 15 minutes."
    Distribute multiple-choice questions.
    "Please choose the correct answers and write down only question numbers with corresponding answers (a, b, c, or d) below your written recalls. You have 10 minutes."
    Collect all the papers.
3. Direction for writing assignment groups

"Please read the passage I just handed out. You can read as many times as you want within 15 minutes. After reading, you will have to write down whatever you can remember from the passage."

Collect texts and distribute a blank piece of paper.

"Please write down whatever you can remember from the passage. You have 15 minutes."

Distribute multiple-choice questions.

"Please choose the correct answers and write down only question numbers with corresponding answers (a, b, c, or d) below your written recalls. You have 10 minutes.

Collect all the papers."
Managing Time

Time. Do you control it, or does it control you? We eat, sleep, play, and work without analyzing each move. Once in a while, however, it's a good idea to watch how well your clock operates.

Make a copy of the "Clock Watch" table. Pick a busy day that would be interesting to watch. Under "Imagined Time," record how long you think each activity will take. Under "Activities," briefly state how you usually use or plan to use your time.

When you have your imagined time schedule charted, check it against the real day's happenings. Under "real time," record how long each activity actually took. Then compared your "Real time" with your "Imagined time." Did you have time to do everything you had scheduled?

You can control your time. Think about ways to improve your time management. Ask yourself:

 a) When is my best time of day to get things done?

 b) Do I use my best time to get the most done?

 c) Do I plan ahead, or just let things happen?

You can use the clock watch to help you take charge of your time. Think about the "Ask yourself" questions. Find out where you could reschedule to make time work better for you.
APPENDIX D

The Difficult Text
Graduate Research Forum

Every year, the Council of Graduate Students, co-sponsored by the Graduate school and the Office of Research, organizes a day-long symposium in which graduate students from across campus are selected on a competitive basis to present their ongoing and completed research.

Students enrolled in any area of graduate study at The Ohio State University are invited to participate in the forum. To enter the competition, students must submit one-page abstracts of research papers or statements of intent for performances, exhibitions and posters. Finalists, selected based upon the merit of abstracts, may give a ten-minute oral presentation or a ten-minute slide show, visual arts exhibition, or performance (live or videotaped). Alternately, students can present a poster of their work, to be judged separately. In addition to their presentations, finalists are required to submit short theses of their work.

Participation in the Forum can be lucrative. Prizes are $300, $200, and $100 for first, second, and third place, respectively, plus a $500 travel grant to the first place winner. Additionally, there are $100 prizes for the first place winners of poster presentations. The presentations
are judged by Ohio State University faculty members, plus at least one judge per area of interest recruited from non-OSU faculty.
APPENDIX E

Multiple-choice Questions for Easy Text
Choose the correct answer. Then write the question numbers with corresponding answers (a, b, c, or d) on the answer sheet.

1. What is this passage about?
   a) real time
   b) imagined time
   c) how to manage time
   d) how to live a daily life

2. What is one of the "Ask yourself" questions?
   a) What should I do first?
   b) When is my best time of day to get things done?
   c) What do I want to do most?
   d) None of the above

3. What is "Imagined Time"?
   a) The time you think each activity will take
   b) The time each activity actually took
   c) Scheduled time
   d) Free time

4. What is the "Clock Watch"?
   a) A clock
   b) Imagined time
   c) Real time
   d) A time table
5. According to the article, what kind of day would be interesting to watch?
   a) a school day
   b) weekends
   c) a busy day
   d) any day

6. We can use the "Clock Watch" to_____.
   a) help get things done
   b) schedule activities
   c) improve time management
   d) all of the above

7. What should we do with "Imagined Time" and "Real Time"?
   a) change them
   b) compare them
   c) reschedule them
   d) choose between them

8. According to the article, there are two choices: plan ahead or_____.
   a) ask questions
   b) reschedule
   c) use the "Clock Watch"
   d) just let things happen

9. What is the correct order according to the passage?
   a) imagined time, real time, reschedule
   b) reschedule, clock watch table, real time
c) imagined time, reschedule, real time

d) clock watch table, real time, imagined time

10. This passage suggests that people should_____________.

a) have imagined time

b) do some activities

c) ask questions about time

d) be able to control their time

_________________________

Expected answers: 1. C2. b 3. a 4. d 5. c


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APPENDIX F

Multiple-choice Questions for Difficult Text
Choose the correct answer. Then write the question numbers with corresponding answers (a, b, c, or d) on the answer sheet.

1. The purpose of this article is to
   a) inform students about the Research Forum
   b) survey about research interests
   c) choose the finalists
   d) determine the prizes for winners

2. Who is the target audience?
   a) Ohio State faculty members
   b) Students from any university
   c) Any Ohio State students
   d) Graduate students doing research

3. The Forum is organized
   a) every year
   b) every quarter
   c) every month
   d) none of the above

4. According to the article, finalists are selected based upon their
   a) posters
   b) oral presentations
   c) abstracts
   d) arts exhibitions
5. What are the prizes for winners of poster presentations?
   a) $100
   b) $200
   c) $300
   d) $500

6. Ten minutes are given for___________.
   a) an oral presentation
   b) a slide show
   c) videotaped performance
   d) all of the above

7. Finalists have to present their research work and___________.
   a) show slides
   b) submit short theses
   c) present posters
   d) B and C

8. How long does the symposium last?
   a) 10 minutes
   b) one day
   c) one hour
   d) information not available

9. Who are the research competition judges?
   a) Ohio State University faculty members
   b) Non-OSU faculty
   c) Council of Graduate Students
d) Both A and B

10. Why does the university sponsor this type of research forum?
   a) competition
   b) university prestige
   c) encouragement
   d) none of the above


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APPENDIX G

Written Recall Protocols

Scoring Template for Easy Text
<table>
<thead>
<tr>
<th>Pausal Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>time</td>
<td>1</td>
</tr>
<tr>
<td>do you control it</td>
<td>2</td>
</tr>
<tr>
<td>or does it control you</td>
<td>2</td>
</tr>
<tr>
<td>we eat</td>
<td>1</td>
</tr>
<tr>
<td>sleep</td>
<td>1</td>
</tr>
<tr>
<td>play</td>
<td>1</td>
</tr>
<tr>
<td>and work</td>
<td>1</td>
</tr>
<tr>
<td>without analyzing each move</td>
<td>1</td>
</tr>
<tr>
<td>once in a while</td>
<td>1</td>
</tr>
<tr>
<td>however</td>
<td>1</td>
</tr>
<tr>
<td>it is a good idea to watch how well</td>
<td>3</td>
</tr>
<tr>
<td>your clock operates</td>
<td></td>
</tr>
<tr>
<td>make a copy of the clock watch table</td>
<td>2</td>
</tr>
<tr>
<td>pick a busy day that would be interesting</td>
<td>2</td>
</tr>
<tr>
<td>to watch</td>
<td></td>
</tr>
<tr>
<td>under imagined time</td>
<td>2</td>
</tr>
<tr>
<td>record how long you think each activity</td>
<td>2</td>
</tr>
<tr>
<td>will take</td>
<td></td>
</tr>
<tr>
<td>under activities</td>
<td>1</td>
</tr>
<tr>
<td>briefly state how long you usually use</td>
<td>2</td>
</tr>
<tr>
<td>or plan to use your time</td>
<td>2</td>
</tr>
<tr>
<td>when you have your imagined time</td>
<td>2</td>
</tr>
</tbody>
</table>
schedule charted
check it against the real day's happenings 2
under real time 2
record how long each activity actually took 2
then compare your real time 2
with your imagined time 2
did you have time to do everything 3
    you had scheduled
you can control your time 3
think about ways to improve your time 3
    management
ask yourself 1
when is my best time of day to get 3
    things done
do I use my best time to get the most 3
done
do I plan ahead 3
or just let things happen 2
you can use the clock watch to help you 2
take charge of your time 2
think about the ask yourself questions 2
find out where you could reschedule 3
to make time work better for you 3

* Total value 73
APPENDIX H

Written Recall Protocols

Scoring Template for Difficult Text
<table>
<thead>
<tr>
<th>Pausal units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>every year</td>
<td>1</td>
</tr>
<tr>
<td>the council of graduate students organizes</td>
<td>3</td>
</tr>
<tr>
<td>a day-long symposium</td>
<td></td>
</tr>
<tr>
<td>in which graduate students from across campus are selected on a competitive basis</td>
<td>3</td>
</tr>
<tr>
<td>to present their ongoing and competed research</td>
<td>3</td>
</tr>
<tr>
<td>the forum is divided into ten areas of evaluation</td>
<td>3</td>
</tr>
<tr>
<td>including such diverse interests as arts</td>
<td>2</td>
</tr>
<tr>
<td>agricultural sciences</td>
<td>2</td>
</tr>
<tr>
<td>engineering sciences</td>
<td>2</td>
</tr>
<tr>
<td>humanities</td>
<td>2</td>
</tr>
<tr>
<td>and social and behavioral sciences</td>
<td>2</td>
</tr>
<tr>
<td>finalists</td>
<td>1</td>
</tr>
<tr>
<td>selected based upon the merit of abstracts</td>
<td>3</td>
</tr>
<tr>
<td>may give a 10-minute oral presentation</td>
<td>2</td>
</tr>
<tr>
<td>or a 10-minute slide show</td>
<td>2</td>
</tr>
<tr>
<td>visual arts exhibition</td>
<td>2</td>
</tr>
<tr>
<td>or performance (live or videotaped)</td>
<td>2</td>
</tr>
<tr>
<td>alternately</td>
<td>1</td>
</tr>
<tr>
<td>students can present a poster of their work</td>
<td>3</td>
</tr>
<tr>
<td>to be judged separately</td>
<td>2</td>
</tr>
<tr>
<td>in addition to their presentation</td>
<td>2</td>
</tr>
</tbody>
</table>
finalists are required to submit short theses of their work
participation in the forum can be lucrative
prizes are $300
$200
and $100
for first
second
and third place
respectively
plus a $500 travel grant to the first place winner
Additionally
there are $100 prizes for the first place winners of poster presentations
the presentations are judged by ohio state university faculty members
plus at least one judge per area of interest
recruited from non-osu faculty

* Total value 78