

Which Prior Knowledge? — Relative Contribution of Prior Knowledge Components to EFL Reading Comprehension*

Jeongsoon Joh
(Konkuk University)

Joh, Jeongsoon. (2004). Which prior knowledge?: Relative contribution of prior knowledge components to EFL reading comprehension. *Language Research* 40(4), 1035-1057.

The purpose of this study is to find out the relative contribution of different aspects of reader knowledge to EFL reading comprehension, and to offer instructional applications for EFL reading classroom based on empirical evidence. Both reader and non-reader variables were included in the design in order to see if the relationship between the type of prior knowledge and comprehension varies as a function of extraneous factors. Results indicated that knowledge of target language vocabulary could be a better predictor of L2 reading comprehension than either the knowledge of syntactic rules in the language or topic knowledge (i.e., content schema). Additional findings and discussion on them are presented, followed by implications for the L2 reading theory and applications for EFL reading instruction.

Key words: prior knowledge, reading comprehension, EFL

1. Introduction

Since the advent of schema theory the role of the reader's prior knowledge in comprehension and learning has been one of the major research topics among reading researchers. 'Schema', now a very common term referring to the (basic unit of) reader knowledge, has largely been studied in the context of L1 reading.

However, as Brown (2001) appropriately points out, 'a number of important differences between first and second language acquisition must be care-

*This work was supported by the faculty research fund of Konkuk University in 2003.

fully accounted for(p. 272)' in spite of considerable commonalities between the two, theories of L1 reading including that of schema and teaching practice based on those theories are not necessarily applicable to L2 reading and instruction exactly as they are.

First of all, L2 reading requires knowledge of additional language system often totally different from one's native language, although both L1 and L2 reading requires content schema and formal schema in order to reach reasonable understanding of a given text. This entails a possibility that a good reader in his native language could become a poor reader when reading L2 texts because reading ability in L1 does not automatically transfer to L2 reading, unless specific conditions are satisfied. In addition, L2 readers generally lack cultural knowledge (called 'cultural schemata') that a writer assumes his readers share as a member of the common cultural community, which frequently causes comprehension difficulty among L2 readers.

A growing awareness of these specifics inherent in L2 reading led researchers to pursue new perspectives or theoretical models of L2 reading that could account for the highly complicated and multi-dimensional nature of L2 reading (Carrell et al., 1988; Clarke, 1980, among others). A large portion of previous studies reflecting these new perspectives on L2 reading investigated how L2 readers' knowledge of the target language system or cultural schemata affects the process and/or product of reading in the language. More specifically, the researchers were greatly interested in elucidating the roles in the process and product of L2 reading played by the knowledge of syntactic constraints, vocabulary, or rhetorical structure in the target language and the knowledge of target culture (Alderson & Urquhart, 1985; Berman, 1984; Carrell, 1984a, 1984b; Carrell & Eisterhold, 1988; Chihara et al., 1989; Conor, 1984; Cziko, 1980; Lee, 1986; Lee and Riley, 1990; Pritchard, 1990; Steffensen & Joag-Dev, 1984; Steffensen et al., 1979).

Motivated by these previous research, the present study attempts to investigate the relative contribution of various types of the reader's prior knowledge to L2 reading comprehension with focus on Korean EFL learners in academic settings. Decomposition of the reader knowledge was implemented in order to specify the role of different types of prior knowledge, which has tended to be viewed as a single comprehensive construct in the field.

The results from this study are expected to provide new perspectives on

the nature of L2 reading in general and EFL reading in particular, which is different from reading in one's native language in some important ways. In addition, the obtained findings could hopefully be applied to L2 reading instruction, by adding to our understanding of the specifics involved in L2 reading comprehension.

2. Review of Literature

Until late 1970's there had been little research that directly concerned reading in a second or foreign language compared with the enormous amount of research on reading in general (i.e., reading in one's native language), and accordingly applying the theories of L1 reading to understanding L2 reading seemed justified, in the absence of empirical research into the specifics inherent in L2 reading. From mid 1970's, however, many researchers began to pay attention to the critical role of target language proficiency in successful L2 reading and provided findings supporting it (e.g., Alderson, 1984; Berman, 1984; Clarke, 1980; Eskey & Grabe, 1988; Lee, 1994). As a result of these empirical studies in L2 reading, most researchers and classroom teachers now take it for granted that an L2 reader must reach a certain level of competence in the target language (called 'threshold level') before he/she can effectively read in that language.

Also, there have been studies that investigated the effect of formal schemata and content schemata on ESL/EFL reading comprehension (e.g., Alderson & Urquhart, 1985; Carrell, 1984a, 1984b; Chihara et al., 1989; Dahl, 1990; Hale, 1988; Lee, 1986; Steffensen et al., 1979). Carrell (1984a) found out that L2 reading comprehension was affected when the content was kept constant but the rhetorical structure was varied. EFL students' background discipline, which is a kind of prior knowledge, was also found to play a role in their reading performance, especially in a testing situation (Alderson & Urquhart, 1985; Hale, 1988). In addition, a person's cultural background is known to influence his/her reading in L2 by way of influencing the way schemata are constructed (Chihara et al., 1989; Pritchard, 1990; Steffensen et al., 1979).

The role of syntax or semantics in the comprehension of L2 texts is another important issue. It was reported that the interaction of the two most facilitated L2 reading comprehension (Barnett, 1986). Dahl (1990) also

noted that the reader's sensitivity to the syntactic features within the text is one of the factors that may influence success in L2 reading. As for the effects of rhetorical organization on L2 readers' comprehension and memory, it was found that the amount of recall was affected by whether the reader recognized the rhetorical structure of the text and organized recall using that structure (Carrell, 1984a; Lee & Riley, 1990).

In summary, a wide variety of factors affect the process and product of L2 reading and it is generally believed that these factors are interwoven rather than independent of one another. In addition, the result of a reading research on these factors can be different depending on what kind of task is used to measure comprehension. Therefore it seems necessary in L2 reading research to use texts that are diverse in topic, difficulty, and rhetorical organization, along with different types of criterial task.

Bearing in mind the findings from previous studies and generally accepted views based either on empirical evidence or on theoretical reasoning, the present study intends to figure out the relative contribution of different types of reader knowledge to reading comprehension in an EFL academic context. In addition, it aims to examine whether and how the role of prior knowledge is influenced by other variables that are known to affect the process of reading or the reader's ability to demonstrate his/her understanding of a text. The resulting research questions are as follows.

- 1) What is the relative contribution to L2 reading comprehension of the different types of reader knowledge?
- 2) Does the role of prior knowledge in L2 reading comprehension vary as a function of the reader's target language proficiency?
- 3) Does the role of prior knowledge in L2 reading comprehension vary as a function of other reader factors such as interest?
- 4) Does the role of prior knowledge in L2 reading comprehension vary as a function of non-reader factors, such as text type and task type?

The following chapters will introduce the detailed methods implemented to find answers to posed research questions for the present study and the findings from it.

3. Method

3.1. Subjects

A total of 157 high school and college level students (77 female and 80 male), all residing in Korea, participated in the study: 61 high school 2nd year students from two schools, one class from each; and 96 college level students (from freshmen to seniors) from two universities. About a half of the high school students were from liberal arts, and the other half from natural science. About three fourths of the college level students were liberal arts or social studies majors, and the remaining was natural science or engineering majors.

3.2. Scope and Definition of the Variables

Recently, Alderson (2000) classified the reader's (prior) knowledge that affects the nature of reading into knowledge of language, knowledge of genre/text type, knowledge of subject matter/topic, world knowledge, cultural knowledge and so on. In the present study, knowledge of language and knowledge of subject matter/topic in Alderson's (2000) terms are examined as the types of reader knowledge, and the former is confined to the reader's knowledge of the *target* language, i.e., English in this case.

A number of previous studies emphasized the critical importance of syntactic knowledge in successful text comprehension in L2 (Barnett, 1986; Bernhardt, 1983; Berman, 1984; Eskey & Grabe, 1988), and some claimed it is the interaction of knowledge of grammar and that of vocabulary that most facilitates comprehension (Barnett, 1983; Bernhardt, 1984; Dahl, 1990). Based on these previous studies, both knowledge of syntactic rules and that of lexical items are measured in the present study as components of target language proficiency, a type of prior knowledge the reader possesses. Then the relative contribution of these two components to EFL learners' reading comprehension is examined, along with that of overall proficiency in the language.

The second type of reader knowledge to be examined is topic knowledge, i.e., knowledge of a specific topic or domain, otherwise called 'content schema' in the literature. Topic knowledge has also been known as a critical factor to comprehend a given text. In the present study, topic

knowledge was defined as the knowledge of the information with high degree of importance in the given text.

In addition to topic knowledge, another form of prior knowledge¹⁾ was measured and used as a variable, i.e., knowledge of vocabulary that has important semantic information in understanding the text, named 'topic vocabulary' in this study. The rationale for this is as follows: 1) There may be discrepancy between topic knowledge and knowledge of topic vocabulary in the context of L2 learning because the former could have been conceptualized, stored, and retrieved basically in one's native language whereas the latter is part of target language knowledge but distinguishable from general target language proficiency in that it is likely to contribute much more directly to the comprehension of the given text; 2) The knowledge of domain area vocabulary could be the most economical and accurate measure of one's prior knowledge, according to Johnston (1983).

3.3. Materials

3.3.1. Reading Texts

Only expository texts were used for the present study, taking into account the type and nature of the texts which the population and the sample under investigation are likely to read most frequently. The selection criteria for the texts are as follows; 1) those written by educated native speakers and written for general readers, not for professionals; 2) those covering a variety of topics and rhetorical organization, and considered equivalent in terms of length and difficulty. Using these criteria and consulting 4 native speakers of English working as visiting professors at a Korean university, as well as referring to related previous studies (Carrell, 1984a; Kendall et al., 1980; Kobayashi, 2002; Meyer and Freedle, 1979), 6 expository texts of three different types of rhetorical organization (two texts per organization type) were finalized. The three organization

1) In general, the term 'prior knowledge' may cover any type of knowledge that a reader already has (before the action of reading a text). Target language proficiency, therefore, can be considered a type of 'prior knowledge' or reader knowledge in its broad sense. In the following sections of this paper, however, the term 'target language proficiency' will be used to refer to 'knowledge of language' and will be compared with 'prior knowledge' which is operationalized in this study as a more specific type of reader knowledge directly related to the text in question—that is, the knowledge of the content area/topic of the given text in the form of conceptual knowledge and the knowledge of lexical items in the given text.

types are as follows: 'list' type where pieces of information on a specific topic are listed, each of which has almost the same degree of importance; 'description' type where facts or phenomena are objectively described or explained; and 'causation' type where causes and effects of an event or a phenomenon are logically presented.

Texts of different organization types were used in the hope that generalization across organization types within expository texts could be made and that the effect of organization type, if any, on the relationship between prior knowledge and reading comprehension could be detected.

3.3.2. Instruments for Measuring Prior Knowledge

3.3.2.1. Measuring Topic Knowledge

To assess the subjects' topic knowledge, four open-ended format items per text were constructed asking about the important messages in the given text. These items were written in Korean, not in English, because topic knowledge should be differentiated from the knowledge of language. The stems of topic knowledge items are almost the same as those in the measure of reading comprehension. The rationale for this is that in this way it could most efficiently be examined whether and how the prior knowledge of the text content contributes to reading comprehension, independent of target language proficiency.

3.3.2.2. Measuring Topic Vocabulary Knowledge

As mentioned earlier, 'topic vocabulary knowledge' is a term of convenience that refers to the reader's knowledge of the words and phrases that constitute a given text. On this measure, the subjects were told to write down the meaning(s) of 10 lexical items from each text carrying information of importance in understanding the text adequately.

3.3.2.3. Measuring General Proficiency in the Target Language

In order to assess the subjects' general English proficiency, a 30 item test was constructed. The test has three sub-tests (10 items each) that were designed to measure knowledge of vocabulary, that of grammatical structures, and reading comprehension ability, respectively. As already mentioned, the present study will examine the relative contribution of components of target language proficiency to reading comprehension, as well as that of overall competence in the language. Items were extracted from existing test preparation materials with confirmed reliability and validity, such as

TOEFL, TEPS, and Cambridge FCE.

3.3.2.4. Measuring Topic Interest

Topic interest was measured in order to see if the contribution of prior knowledge can be different as a function of interest in the topic of the text, and was assessed by having the subjects indicate the degree of their interest in the text topic by means of marking one of the five scale descriptors ranging from 'Not interested at all (1)' to 'Very interested (5)', after they read a given text.

3.3.2.5. Measuring Reading Comprehension

As a measure of reading comprehension ability, two types of test tasks were constructed different in format but basically asking the same. First, 10 multiple-choice items (five per text) were constructed for each of three text types. The open-ended format was formed by deleting alternative choices from the multiple-choice format, in order to make the two task types equivalent except the response format itself.

The purpose of using two different formats of reading comprehension task is to examine if the role of prior knowledge could be found different depending on what type of task is used to measure reading comprehension. The items contained both textually explicit and implicit questions: one out of the five concerning the main idea, three, specific details important in understanding the text on the whole, and the remaining one requiring the reader to infer from the given information.

3.4. Procedure

Data was collected between November and December in 2003, during regular class hours. With the help of the instructors of the classes, the researcher gave a brief instruction on the task, and randomly distributed the test packets to the subjects so that approximately the same number of the subjects could be assigned to each text organization type or task type. The test packet was composed of a measure of prior knowledge, of general English proficiency, and of reading comprehension, packed in this order. As the pilot test predicted that it would take approximately 60 minutes to complete the test packet, maximum 60 minutes were given to the subjects. It would have been much better to separately administrate the three subparts in the test packet with enough interval among them.

However, due to the limited time allowed for the researcher to collect data at each school, data gathering had to be completed with just one visit to each school. Having the subjects finish all the three tasks consecutively at one site was an inevitable consequence of this circumstantial constraint. As an effort to alleviate the subjects' mental fatigue coming from this constraint, approximately 10 min break was given between the first two parts and the last part of the packet.

In administrating the test packet, it was critical that measuring the subjects' topic knowledge precede measuring their comprehension, since the measure of topic knowledge tapped basically the same as that of reading comprehension, except the language of assessment. For this reason, the subjects were instructed to strictly follow the order of presentation in the packet, and the researcher promptly collected the completed sheets, walking around the classroom and closely observing the subjects' performance.

3.5. Data Analysis

In scoring, 0 or 1 point was given per item for multiple-choice items, and partial credit was permitted for open-ended items. As a result, 0, 0.5, or 1.0 point per item was given for open-ended format items depending on the degree of adequacy of the answer. The rationale and validity of this scoring procedure are described in detail in Joh's (1997, 1998) studies.

As the open-ended format was used for the measure of prior knowledge, the same criteria were used as in the open-ended format reading comprehension task described in the above. With the ten vocabulary items, 0.5 point was given for those answers that provided one of the possible meanings but different from that as used in the given text.

For statistical Analysis, an English version of SPSS (11. 0) was used. Mostly correlation and regression analyses were conducted to investigate the degree of relationship between prior knowledge and reading comprehension on the one hand, and the relative contribution of different aspects of prior knowledge to reading comprehension on the other hand. Additionally used were ANOVA's when necessary to compare means among groups.

4. Results and Discussion

Prior knowledge has been recognized as one of the major reader variables, maybe the most crucial factor, in L2 reading comprehension. The reader's linguistic competence in the target language and topic knowledge of the text being read, among others, have most frequently been mentioned in the literature. Of the target language competence, the knowledge of syntactical constraints and of vocabulary has been recognized as the most important aspect of linguistic knowledge. In the following, the results of statistical analyses are presented, which will provide clues to answer the research questions posed.

4.1. Language Proficiency and Comprehension

As expected, there was a high correlation of .71 between target language proficiency and reading comprehension in the language. Since researchers consistently have emphasized the importance of knowledge of target language syntax and vocabulary in successful L2 reading, additional analyses were conducted in order to see which component of target language proficiency was more closely associated with reading comprehension. Table 1 shows that knowledge of vocabulary had a little higher correlation with reading comprehension than knowledge of grammar.

Table 1. Correlation Between Proficiency and Reading Comprehension

Measure of TL Proficiency	Correlation with RC
Total Score	.71 (p <.01)
Grammar subtest	.55 (p <.01)
Vocabulary subtest	.63 (p <.01)
RC subtest	.67 (p <.01)

The table indicates that the L2 reader's general knowledge of the target language is highly associated with reading comprehension in the language and that command of vocabulary might have a little greater contribution than knowledge of syntactical rules.

4.2. Prior knowledge and Reading Comprehension

Since the advent of schema theory, researchers have been eager to elucidate the role of prior knowledge in learning, cognition, and comprehension. In the present study two types of prior knowledge were examined that could directly affect the understanding of a given text: topic knowledge (knowledge of the topic area of the text) and knowledge of topic vocabulary. Table 2 shows the result of correlation analysis.

Table 2. Correlation between Prior Knowledge and Comprehension

Type of Prior Knowledge	Correlation (r)
Topic knowledge + Topic vocabulary	.68 (p <.01)
Topic knowledge	.34 (p <.01)
Topic vocabulary	.67 (p <.01)

The table reveals high degree of correlation between the subjects' prior knowledge on the whole and their reading comprehension. In addition, it suggests that a large portion of this high correlation could be attributed to 'topic vocabulary', considering the much higher correlation found with topic vocabulary than with topic knowledge.

The low correlation of .34 between topic knowledge and reading comprehension was rather an unexpected result, as the measure of topic knowledge in the present study directly tapped the major information in the given texts, not one's general background knowledge of the topic/area. This result is also quite interesting as it implies that knowing a lot about the content of the text being read does not necessarily result in better comprehension of the very text. Using the terms in schema theory, the presence of content schema did not greatly facilitate the reading process, contra what schema theory would predict, at least in the context of the present study.

In contrast, knowledge of vocabulary appearing in the given text was closely interrelated with reading comprehension as can be seen from the high correlation of .67 in Table 2. The result is seemingly telling us that in L2 reading one's knowledge of a specific topic/area does not contribute to the understanding of a text on that topic as much as his knowledge of (some of) the lexical items in the given text does.

What can explain this phenomenon? A possible reasoning would be that

one's knowledge of a specific topic/area (i.e., one's content schema) is probably conceptualized in his mother tongue in the form of underlying propositions. This prior knowledge is supposed to facilitate the reader while reading a text on a related topic as the schema theory speculates. However, something hinders this facilitating effect of schema on reading process. What is that 'something'?

At this point we need to remember that the schema theory is based on reading in one's native language. That is, the well-known facilitating effect of schemata may not automatically apply to L2 reading. Instead, the reader's knowledge of target language vocabulary appearing in the text was a better facilitator in his comprehension of the given text, by providing semantic information necessary for decoding the text written in an 'unfamiliar' language.

This finding is in line with the higher correlation found with the vocabulary score than with grammar score in Table 1, suggesting that target language proficiency probably plays a much stronger role in L2 reading comprehension than content schemata and that knowledge of vocabulary can be the best predictor of successful L2 reading. The correlation coefficients in Table 3 partly supports this reasoning. In the table 'TL' stands for 'target language', 'PK', prior knowledge, and 'Total PK', the sum of scores in the measures of topic knowledge and topic vocabulary.

Table 3. Correlations among Knowledge Variables

	Total Prof.	TL Gr.	TL Voc.	Topic Know.	Topic Voc.	Total PK
Total Prof.	1	.83	.87	.28	.77	.75
TL Gr.		1	.55	.21	.56	.55
TL Voc.			1	.27	.71	.70
Topic Know.				1	.34	.58
Topic Voc.					1	.96
Total PK						1

Note. All the correlations are significant at .001.

The near perfect correlation between combined prior knowledge and topic vocabulary in Table 3 illustrates that almost all of the high correlation found between prior knowledge and reading comprehension comes from the relationship between knowledge of topic vocabulary and comprehension.

A high correlation of .77 between target language proficiency and topic vocabulary also implies the portion one's vocabulary knowledge can explain in his reading comprehension.

Meanwhile, the low correlation between topic knowledge and comprehension ($r = .34$) in Table 2, and similarly low correlation between topic knowledge and topic vocabulary ($r = .34$) in Table 3 seem to provide a partly contradictory evidence to Bernhardt's (1984) claim that semantic knowledge is useful primarily when it can be related to the background knowledge of the reader. In other words, in the present study readers' semantic knowledge (i.e., their knowledge of vocabulary) contributed to their understanding to a great extent ($r = .63 \sim .67$) without showing a strong relationship with their background knowledge (i.e., topic knowledge).

4.3. Prior Knowledge and Comprehension by TL Proficiency

Now turning to Research Question 2, i.e., whether the role of prior knowledge (defined as topic knowledge and topic vocabulary in this study) is different depending on the reader's competence in the target language, additional analyses were conducted for three different proficiency groups that were formed based on the subjects' scores on the measure of general English proficiency. Table 4 shows the criterion and Table 5, the result of correlation analyses.

Table 4. Criterion for Level Specification

Level	Range of scores		# of Subjects
High	0-12	out of 30	53
Middle	13-19		50
Low	20-29		54

Table 5. Correlation between Prior Knowledge and Comprehension by Level

Type of PK	High	Middle	Low	Total
(a) Topic knowledge	.30 ($p < .05$)	.26 NS	.24 NS	.34 ($p < .01$)
(b) Topic vocabulary	.32 ($p < .05$)	.44 ($p < .01$)	.11 NS	.67 ($p < .01$)
(a) + (b)	.38 ($p < .01$)	.43 ($p < .01$)	.25 NS	.68 ($p < .01$)

Table 5 indicates that the relationship between text-related prior knowledge and reading comprehension could be different depending on the reader's general proficiency in the target language, but not dramatically. As can be seen in the table, while the correlation was generally moderate with the High and/or Middle proficiency subjects, it was always low and even without statistical significance with the Low proficiency subjects.

As for the higher correlation between topic vocabulary and comprehension found with the Middle group than with the High group, putting aside the Low group which showed a 'floor effect' in the measure of reading comprehension, it is possible that the former relied more on semantic knowledge due to their limited target language proficiency than the latter who had relatively better command of the target language.

4.4. Reader Knowledge and Reading Comprehension by Text and Task Type

In order to see if the relationship between reader knowledge and L2 reading comprehension could be different as a function of text type and/or task type used to measure comprehension, further analyses were conducted and the result tables are presented in the following. It was assumed that there was no significant preexisting difference among the three text type groups in Table 6 based on the result of ANOVA ($F = .147$, $p = .863$).

Table 6. Correlations between Knowledge and Comprehension by Text Type

		Text Type		
		Causation	Description	Listing
TL Proficiency	Grammar	.62	.54	.50
	Vocabulary	.60	.58	.73
Prior Knowledge	Topic K.	.28	.36	.38
	Topic Voc.	.65	.61	.77

Note. All the correlations in Table 6 are significant at .01 level.

As the table shows, there are not dramatic differences in correlation attributable to the difference in text organization type, with the exception

of the relatively high figures found with the listing type text between knowledge of topic vocabulary and comprehension ($r=.77$), and between general knowledge of vocabulary and comprehension ($r=.73$).

This result seems to suggest the possibility that the reader may more actively utilize their prior knowledge of target language lexicon when reading a listing type text. As already described in the earlier section of this paper, the listing type text is characterized by a series of information on a specific topic where each piece of information can be considered equally important. This means that this type of text may impose cognitively heavier burden on the reader, especially when the reader has to prove his comprehension in whatever way, in that the reader possibly has more propositions of comparable importance to retain in his short-term memory. Therefore the reader with more semantic prior knowledge (especially the knowledge of vocabulary that carry most of the semantic information in the given text, i.e., 'topic vocabulary') might better comprehend this type of text.

Table 7 in the below is a summary of correlation analysis conducted to see if the type of task used to measure reading comprehension affects the relationship between reader knowledge and comprehension. It was assumed, again, that there was no significant preexisting difference between the two task groups based on the result of ANOVA ($F = 2.96, p = .087$). All the correlations in Table 7 were significant at .01 level, except the one between topic knowledge and comprehension when the task was multiple-choice format.

Table 7. Correlations between Knowledge and Comprehension by Task Type

Reader Knowledge		Task Type	
		Multiple-Choice	Open-Ended
TL Proficiency	Grammar	.49	.56
	Vocabulary	.62	.65
Prior Knowledge	Topic K.	.21 (NS)	.46
	Topic Voc.	.61	.74

Table 7 reveals the correlations are generally higher when the response format was open-ended. Although the difference in the coefficients is not large in most of the comparison pairs, the correlation between topic

knowledge and comprehension by task type deserves our attention. Considering the generally low correlation between topic knowledge and comprehension found in the present study, ranging from .24 to .34 at best (See Table 5 for more detailed information), the correlation of .46 found in the open-ended format task can be said relatively high, especially compared with the low, even non-significant correlation of .21 found in the multiple-choice format task.

This result implies that the contribution of the reader's knowledge of topic area to the comprehension of a text would be greater in the open-ended task, which requires 'comprehension and *production* (or '*construction*'), than in the multiple-choice task, which requires 'comprehension and selection' only (cf. Bachman & Palmer, 1996). It also suggests the need of caution in interpreting and/or generalizing the findings from reading research. That is, the relationship between prior knowledge and comprehension or the contribution of prior knowledge to comprehension could be different depending on the type and nature of a task used to measure the construct of comprehension.

4.5. Interrelationships among Interest, Prior Knowledge, and Comprehension

As already well known, a wide variety of factors affect the process and product of L2 reading and it is generally believed that these factors are interwoven rather than independent of one another. The reader's interest is one of those factors and there have been several studies that examined the role of topic interest in relation to prior knowledge (Baldwin et al., 1985; Garner & Gillingham, 1992; Osaka, & Anders, 1983; Schumann et al., 1992).

Motivated by these previous research and a general belief in the complicated interactions among variables, the present study explored the relationship among topic interest (i.e., the reader's interest in the topic of the text being read), prior knowledge, and reading comprehension, with special attention to the role of topic interest in the relationship between prior knowledge and L2 reading comprehension.

Results showed a general tendency where the correlation between topic knowledge and topic interest gets stronger as the reader's target language proficiency gets lower, ranging from .41 with High level subjects to .52 with lower level ones. This result is parallel to the tendency found in the

correlation between topic interest and reading comprehension as a function of target language proficiency: the lower the reader's language proficiency, the higher the relationship between topic interest and his achievement in the measure of reading comprehension (Joh, 2004).

In spite of the generally low correlation either between topic interest and L2 reading comprehension (around .3) found in Joh (2004) or between topic knowledge and comprehension (about .3 or below) found in the present study, this finding deserves attention in that it could provide a clue to understand the intricate nature of interactions among the variables that affect reading process and product.

The higher correlation between topic knowledge and topic interest found with lower level students implies that knowledge of text topic may ultimately contribute to better understanding of a given text on the part of those limited proficiency students by way of its contribution to an increased interest in the text. In other words, increased interest will render a reader more focused and actively engaged in reading process. This focused and active engagement in reading process will, if repeated and accumulated, be likely to result in better comprehension and achievement.

This reasoning seems plausible, though empirical evidence is necessary, for several reasons. First, topic interest or topic knowledge in the present study was not manipulated as independent variables. Rather they were investigated simply in terms of correlation with all the relevant variables put into the analysis simultaneously. Therefore, a longitudinal study may bring out somewhat different results from those in the present study. In addition, as Joh (1997) noted, it is possible that students of limited language proficiency may not have any motivation to read from the first when the text is about a topic they are not familiar with or not interested in, while high level students are generally not much affected by interest in their reading performance. This lack of motivation in turn may lead to increased unwillingness to perform the task in hand, and finally to poor achievement.

5. Conclusion

The present study attempted to examine the relationship between different types of prior knowledge and reading comprehension in the

context of EFL learning in an effort to better understand the role of prior knowledge in L2 reading in general.

One of the major findings from the study was that readers' knowledge of target language vocabulary was more closely associated with their reading comprehension in the language than their knowledge of syntactic rules of the language. The correlation between the subject's syntactic knowledge and vocabulary language in English was rather mediocre, while the correlation between their knowledge of English vocabulary in general and that their knowledge of lexical items appearing in the experimental texts was fairly high. There was about 5 percent difference in the amount of variance (that explains the scores on the measure of reading comprehension) between the subjects' knowledge of English vocabulary in general and their knowledge of words/phrases appearing in the experimental texts, suggesting that knowledge of the lexical items comprising a given text may more contribute to the comprehension of the text than knowledge of vocabulary in general.

This result implies: 1) that knowledge of target language lexical items, whether or not they appear in the text to be read, may possibly more contribute to the comprehension of the text than that of syntactic rules; 2) and that L2 learners' vocabulary knowledge could be quite a different aspect from their knowledge of syntactic rules, sharing only about 30% of common variance in their overall competence in the target language.

Applying this implication to EFL reading classroom, it is recommendable that learners need to put more efforts to expand their knowledge of English vocabulary by paying special attention to semantic plurality of individual lexical items and wide range of idiomatic expressions. At the same time, teachers need to develop effective methods of teaching vocabulary for adult EFL learners.

Another finding of interest was relatively low correlation (around .3) either between topic knowledge and reading comprehension or between topic knowledge and knowledge of topic vocabulary. This result partly supports the claim that the best single predictor of foreign language reading ability is target language proficiency (Alderson et al., 1987). It also provides additional evidence for the importance of schema activation in successful understanding of a text (Dahl, 1990), as well as existence of schema itself, especially in L2 reading.

This finding suggests the existence of a new type, or a different aspect, of 'threshold level', at which L2 readers' content schemata could be

activated to facilitate their comprehension of a given text. That is, an L2 learner's content schemata or prior knowledge on the topic of the text may not be fully utilized unless his competence in the language has not reached a certain level. The subjects in the lower proficiency groups in the present study might have been exerting most of their mental capacity in decoding the text, not fully realizing that the text they were reading was about a topic of which they already had some background knowledge, due to their limited knowledge of the language, especially that of lexical items.

When Lee (1994) first reported the existence of a threshold level among Korean secondary school EFL learners, the 'level' mostly concerned the transferability of L1 reading skills to L2 reading situations. The result from the present study seems to suggest a need to expand the concept of EFL readers' threshold level that is required for effective activation of relevant schemata.

The role of topic interest, an affective variable known as a factor in reading in general, in the relationship between prior knowledge and comprehension was another area of examination in the present study. The result showed that the correlation between topic knowledge and topic interest was higher with lower proficiency subjects, implying the possibility that L2 learners with limited target language proficiency may tend to be interested in the text whose topic they are familiar with to a greater extent than higher proficiency learners.

An instructional application of this finding to EFL reading classroom would be that at pre-reading stage the teacher needs to spend more time on providing background knowledge for LEP (limited English proficiency) students than for higher proficiency counterparts. With increased knowledge of the text topic, then, the lower proficiency learners could possibly keep their interest in reading the given text.

The relationships between reader knowledge and comprehension were generally stable across different text types, with an exception of a relatively higher correlation found between knowledge of vocabulary and comprehension in listing type texts. An implication from this result could be that the reader might rely more on his knowledge of vocabulary when reading a text that contains a number of propositions of equal importance, and therefore imposes heavier burden on memory.

Another finding of interest in terms of reading instruction as well as L2 reading theory was that the correlation between reader knowledge and

comprehension was always, though not dramatically, higher when the task required 'production' also as in the open-ended format. A possible implication from this finding in relation to EFL reading instruction would be that learners could improve their reading skills by working vigorously on those reading tasks as post-reading activities that require both comprehension and construction (such as open-ended items or summary), rather than those that simply require comprehension and selection, such as multiple-choice, true/false, or matching. It is because with the former type of tasks the components of reader knowledge seem to be more dynamically activated, making greater contribution to the eventual comprehension of a given text.

The present study has some limitations in scope and consequently limitations in generalization of the results obtained. First, text type was reduced to text organization. Also there could be different ways of categorizing organization type for expository texts. Second, the subjects did not have any obligation to complete the experimental task as they were a kind of sample of convenience, and this condition could have affected the result to an extent. Another limitation is the nature of data: only quantitative data was analyzed. In addition, the possible threat coming from very complicated interrelationships among components of reader knowledge was not completely dealt with in statistical terms.

In spite of these limitations, the findings from this study are expected to add to our understanding of the nature of L2 reading that does not have exactly the same mechanism as reading in one's native language on the one hand, and to offer a few insights on the instruction of L2 reading on other hand.

References

- Alderson, J. C. (1984). Reading in a foreign language: A reading problem or a language problem? In J. C. Alderson & A. H. Urquhart, eds., *Reading in a foreign language* (pp 1-27), Essex: Longman.
- Alderson, J. C. (2000). *Assessing reading*. Cambridge University Press.
- Alderson, J. C. and Urquhart, A. H. (1985). The effect of students' academic discipline on their performance on ESP reading tests. *Language Testing*, 2, 192-204.
- Alderson, J. C., Henning, G., and Lukmani, Y. (1987, April). *Levels of*

understanding in reading comprehension tests. Paper presented at the Ninth Annual Language Testing Research Colloquium, Miami, FL.

- Bachman, L. F. and Palmer, A. S. (1996). *Language testing in practice.* Oxford: Oxford University Press.
- Baldwin, R. S., Peleg-Bruckner, Z., and McClintock, A. H. (1985). Effects of topic interest and prior knowledge on reading comprehension. *Reading Research Quarterly*, 20, 497-508.
- Barnett, M. A. (1986). Syntactic and lexical/semantic skill in foreign language reading: Importance and instruction. *Modern Language Journal*, 70, 343-349.
- Berman, R. A. (1984). Syntactic components of the foreign language reading process. In J. C. Alderson & A. H. Urquhart, eds., *Reading in a foreign language* (pp. 139-159), New York: Longman.
- Bernhardt, E. B. (1983). Three approaches to reading comprehension in intermediate German. *Modern Language Journal*, 67, 111-115.
- Brown, H. D. (2001). *Principles of language learning and teaching* (4th ed.). Longman.
- Carrell, P. (1984a). The effects of rhetorical organization on ESL readers. *TESOL Quarterly*, 18, 441-469.
- Carrell, P. (1984b). Schema theory and ESL reading: Classroom implications and applications. *Modern Language Journal*, 68, 332-343.
- Carrell, P., Devine, J., and Eskey, D. (1988). *Interactive approaches to second language reading.* New York: CUP.
- Carrell, P., & Eisterhold, J. (1988). Schema theory and ESL reading pedagogy. *TESOL Quarterly*, 17, 553-573.
- Chihara, T., Sakurai, T., and Oller, J. W. (1989). Background and culture as factors in EFL reading comprehension. *Language Testing*, 6, 143-151.
- Clarke, M. A. (1980). The short circuit hypothesis of ESL reading - or when language competence interferes with reading performance. *Modern Language Journal*, 64, 203-209.
- Conor, U. (1984). Recall of text: Differences between first and second language readers. *TESOL Quarterly*, 18, 139-256.
- Cziko, G. A. (1980). Language competence and reading strategies: A comparison of first- and second language oral reading errors. *Language Learning*, 30, 101-116.
- Dahl, T. I. (1990). *The implication of language for theories of comprehension and cognitive construction of ideas.* Unpublished doctoral

- dissertation, University of Texas at Austin.
- Eskey, D. and Grabe, W. (1988). Interactive models for second language reading: Perspectives on instruction. In P. Carrell, J. Devine & D. Eskey. eds., *Interactive approaches to second language reading* (pp. 223-238), New York: CUP.
- Garner, R. and Gillingham, M. G. (1992). Topic knowledge, cognitive interest, and text recall: A microanalysis. *Journal of Experimental Education*, 59, 310-319.
- Hale, G. A. (1988). Student major field and text content: Interactive effects on reading comprehension in the TOEFL. *Language Testing*, 5, 49-61.
- Joh, J. (1997). *The effects of assessment features on performance in EFL reading comprehension tests*. Unpublished doctoral dissertation. University of Texas at Austin.
- Joh, J. (1998). How does text availability affect performance in EFL reading comprehension tests? *English Teaching*, 53(3), 199-216.
- Joh, J. (2004). Interactions among the reader, text, and task variables in EFL reading comprehension performance. *English Teaching*, 59(3), 113-142.
- Johnston, P. H. (1983). Prior knowledge and reading comprehension test bias. *Reading Research Quarterly*, 19, 219-239.
- Kendall, J. R., Mason, J. M., and Hunter, W. (1980). Which comprehension? Artifacts in the measurement of reading comprehension. *Journal of Educational Research*, 73, 233-236.
- Kobayashi, M. (2002). Method effects on reading comprehension test performance: Text organization and response format. *Language Testing*, 19, 193-220.
- Lee, J. (1994). *Language proficiency in foreign language reading: A study of Korean students*. Unpublished doctoral dissertation, University of Texas at Austin.
- Lee, J. F. (1986). Background knowledge and L2 reading. *Modern Language Journal*, 70, 350-354.
- Lee, J. F. and Riley, G. L. (1990). The effect of prereading, rhetorically-oriented frameworks on the recall of two structurally different expository texts. *Studies in Second Language Acquisition*, 12, 25-41.
- Meyer, B. J. F. and Freedle, R. O. (1979). Effects of discourse type on recall. *American Educational Research Journal*, 21, 121-143.
- Osaka, G. N. and Anders, P. L. (1983). The effect of reading interest on

comprehension of expository materials with controls for prior knowledge. In J. A. Niles & L. A. Harris, eds., *Searches for meaning in reading/language processing and instruction* (pp.56-60), Rochester, NY: National Reading Conference.

- Pritchard, R. (1990). The effects of cultural schemata on reading processing strategies. *Reading Research Quarterly*, 25, 273-295.
- Schumann, J. S., Mangrum, C. T., Gordon, J., and Doucette, M. (1992). The effect of topic interest and prior knowledge on the predicted test questions of developmental college readers. *Reading Research and Instruction*, 31, 11-24.
- Steffensen, M. S. and Joag-Dev, C. (1984). Cultural knowledge and reading. In J. C. Alderson & A. H. Urquhart, eds., *Reading in a foreign language* (pp. 48-64). New York: Longman.
- Steffensen, M. S. and Joag-Dev, C., & Anderson, R. C. (1979). A cross-cultural perspective on reading comprehension. *Reading Research Quarterly*, 1, 10-29.

Jeongsoon Joh

Dept. of English Language and Literature, Konkuk University
1 Hwayang-dong, Kwangjin-ku
Seoul 143-701, Korea
Email: johjs@konkuk.ac.kr

Received: Sept. 1, 2004

Revised version received: Nov. 1, 2004

Accepted: Nov. 11, 2004