

The Effects of Vocabulary Knowledge and Background Knowledge on Reading Comprehension of Taiwanese EFL Students

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Abstract

Many studies have shown that vocabulary knowledge and background knowledge can help students read and comprehend better. The more vocabulary students know, the better they can decode and understand what they read. In contrast, background knowledge helps students make successful inferences. Therefore, this study looks at the effects of vocabulary knowledge and background knowledge in an EFL reading comprehension test. The participants consisted of 159 students from a college in Southern Taiwan. The result of the study showed that the participants who received a list of vocabulary to study performed significantly better on the reading comprehension test than the participants who relied on background knowledge. This led to a discussion in the conclusion about the need for vocabulary building for college EFL students in Taiwan.

1 Introduction

While the study of English becomes a commonplace nowadays, especially in Taiwan, reading in English is becoming increasingly important for the students. They need to be able to read texts in English, not only for academic purposes, but also for their careers. Reading has many beneficial effects in language acquisition. Some researchers believe that reading facilitates language development (Martin-Chang & Gould, 2008). The more a person reads, the more they will develop their vocabulary knowledge. Reading can also help students improve their spelling and writing skills (Harmer, 2007). When students enroll in an English reading class, they will always, at one point or another, be tested on their reading ability. When they fail an English reading test, they may feel disappointed and discouraged but it does not mean that they are poor readers. They fail the English reading test simply because they do not know enough words in order to understand texts and answer the comprehension questions. After all, they can read and understand everything perfectly in their native language (L1). Although studies in L2 reading are quite common in language research, there have been few studies conducted to explore the effects of vocabulary and background knowledge on reading comprehension of Taiwanese EFL students.

2 Review of literature

Reading is a very complex process that requires many different skills. Hancock (1998) believes that in reading, “comprehension involves understanding the vocabulary, seeing relationships among words and concepts, organizing ideas, recognizing the author’s purpose, evaluating the context, and making judgments” (p. 69). Because of its complexity, researchers have studied and examined many different areas of reading. Some studies looked at the effects of prior knowledge

in reading comprehension (Brantmeier, 2005; Hammadou, 1991, 2000; Johnson, 1982; Lee, 1986; Nassaji, 2003; Qian, 2002) while others have examined the effects of vocabulary knowledge (Alderson, 2000; Joshi & Aaron, 2000; Martin-Chang & Gould, 2008; Nagy & Scott, 2000; Pressley, 2000). Knowing how prior knowledge and vocabulary knowledge help reading comprehension would be an important area to explore because it could give teachers new approaches to teaching.

2.1 Studies on the effects of prior knowledge

As the background or content knowledge about a subject or theme, prior knowledge is an important aspect to successful reading. In second language research, there is evidence that having this prior knowledge plays a significant role in comprehension (Brantmeier, 2005; Hammadou, 1991, 2000; Johnson, 1982; Lee, 1986; Nassaji, 2003; Pulido, 2004, 2007). For example, Johnson (1982) finds that a lack of cultural familiarity in ESL students has a greater impact on reading comprehension of a passage on Halloween than the pre-teaching of vocabulary. Lee (1986) has studied the effects of background knowledge in reading, understanding and recalling of text in second language learners and finds that the learners' ability to recall is enhanced when they are presented with one of the three components of background knowledge, context, transparency, and familiarity.

One theory concerning why prior knowledge effects comprehension is the ability of the students to make inferences. According to Hammadou (1991), inference refers to a cognitive process used to construct meaning through a thinking process that involves reasoning beyond the text through generalization and explanation. In the study, Hammadou (1991) examines inference strategies used by students and finds that background knowledge affects the comprehension process. The results of the study show that beginner readers use a greater amount of inference in recall than advanced readers. Because greater inference is used by novice readers, this is an indication that the readers' background knowledge affects the comprehension process and that recall and comprehension are not the products of the text alone.

In addition to using inferences, analogies could be used to help readers tie new, unfamiliar materials to familiar information in their memory. However, teachers should be careful when introducing analogies because some analogies do not provide any assistance to the learner. According to Hammadou (2000, p. 39), "for an analogy to aid comprehension optimally, the underlying structures of each part of the analogy must be similar, but the surface features should be very different." In their studies, both Hammadou (2000) and Brantmeier (2005) find that providing second language readers with analogies does not help improve reading comprehension, especially for longer, more difficult passages. This is because the use of analogy would sometimes make the reading passages more complex and more difficult to understand (Brantmeier, 2005). As a result, the analogies in the reading passages become a burden. Similar results have been found in Pulido (2004 & 2007) where background knowledge does not moderate the relationship between comprehension and retention of meaning from the text. In one study, Pulido (2004) examines the effects of cultural background knowledge on incidental vocabulary gain of nonsense words through reading and finds that background knowledge does not help students with weaker levels of L2 reading proficiency and limited vocabulary knowledge.

Although many studies have shown the effects of prior knowledge in reading comprehension, acquiring background knowledge is usually not the focus of many foreign language classrooms. Many of the textbooks used in the foreign language classes often focus on developing various reading strategies such as previewing, skimming and scanning, summarizing, reviewing, critical thinking, understanding text structure and most importantly, vocabulary building. Vocabulary is important in reading comprehension because vocabulary knowledge is part of background knowledge. The more words the readers know, the easier they will understand what they read.

2.2 *Studies on the effects of vocabulary knowledge*

There are several studies that have shown the relationship between vocabulary knowledge and reading comprehension (Joshi, 2005; Joshi & Aaron, 2000; Manyak & Bauer, 2009; Martin-Chang & Gould, 2008; Ricketts, Nation, & Bishop, 2007). Joshi and Aaron (2000) find that vocabulary knowledge is a strong predictor of reading ability when factoring reading speed with decoding and comprehension. Martin-Chang and Gould (2008) find a strong correlation both between vocabulary and reading comprehension and between reading rate and primary print knowledge. Vocabulary knowledge is essential in reading comprehension because it has a similar function to background knowledge in reading comprehension. Vocabulary knowledge helps students in decoding, which is an important part of reading (Qian, 2002).

Many researchers consider vocabulary knowledge to be an important variable that affects reading comprehension in both first and second language learning (Alderson, 2000; Joshi, 2005; Qian, 2002; Ricketts et al., 2007). A limited vocabulary size, as well as a lack of sufficient knowledge of word meanings, often hinders learners from understanding the meaning of the text. Garcia (1991) finds that a lack of familiarity with vocabulary in the test passages and questions is a powerful factor affecting fifth and sixth grade Latino bilingual learners on a test of reading comprehension. Qian (1999, 2002; Qian & Schedl, 2004) studies the roles of breadth and depth of vocabulary knowledge in reading comprehension in academic settings. Breadth of vocabulary knowledge refers to the size of vocabulary that a person knows and depth of vocabulary knowledge relates to how well the person knows a word. The two factors play an important role for second language learners because learners are more likely to come across words in which they are not familiar. According to Qian (2002), "having a larger vocabulary gives the learner a larger database from which to guess the meaning of the unknown words or behavior of newly learned words, having deeper vocabulary knowledge will very likely improve the results of the guessing work" (p. 518).

Other studies have looked at the relationship of various aspects of reading skills such as vocabulary, reading comprehension, reading rate and print exposure. Ricketts et al. (2007) find that vocabulary is related to some aspects of reading only and that a child's oral vocabulary (the ability to read aloud) could limit comprehension if the text contains words that are new. Therefore, oral vocabulary is related with reading comprehension and that it is vocabulary knowledge that drives the association between reading comprehension and exception word reading. In another study, Martin-Chang and Gould (2008) look at the relationship among vocabulary, reading comprehension, reading rate and print exposure. They find a positive relationship between vocabulary knowledge and reading comprehension on primary print knowledge (personal reading materials) and secondary print knowledge (general literacy materials). There is also a strong correlation between reading rate and primary print knowledge, but not secondary print knowledge. This suggests that reading for pleasure is an important part of language development because it can increase vocabulary knowledge and reading rate, both of which facilitate reading comprehension.

The studies above have shown the relationship between vocabulary knowledge and reading comprehension. This current study will focus on the effects of vocabulary knowledge and background knowledge on a test of reading comprehension in a foreign language. It is assumed that students need to understand the meaning of the words in order to fully understand the reading passage in a foreign language. Students with high levels of vocabulary knowledge will be able to decode and understand the reading passage better than students with low levels of vocabulary (Nation, Clarke, Marshall, & Durand, 2004).

3 **Methods**

The main purpose of this study is to find out how the factors of background knowledge and vocabulary knowledge affect Taiwanese students' English reading comprehension ability. According to the literature review, both background knowledge and vocabulary knowledge will help students

increase their overall reading comprehension. Therefore, the main goal of this study is to find out 1) whether there is a difference in the reading comprehension scores when the students are familiar with the background knowledge of the reading passage, and 2) whether there is a difference in the reading comprehension scores when students are familiar with the vocabulary knowledge of the reading passage.

3.1 Participants

The sample of the study comprised of 159 students from a medium sized college in Southern Taiwan. Both male and female students were used as the participants in the study. The participants were from three different classes in the English Department. A random number generator was used to classify the three classes as Group A (N=55), the control group; Group B (N=55), the background knowledge group; and Group C (N=49), the vocabulary knowledge group. An English proficiency test based on TOEIC (Test of English for International Communication) Intermediate Level was administered during the first week of classes and the mean scores for the three groups were computed: Group A, 56.67; Group B, 54.72; and Group C, 58.67.

3.2 Instrument identification and assessment tool

There were several instruments used in this study on the effects of background knowledge and vocabulary knowledge. The main assessment tool used for this study was the TOEFL preparation manual, *30 Days to the TOEFL CBT*. The reading comprehension test consisted of three selected reading passages and questions from the TOEFL preparation manual. The first reading passage was about donating blood. The second passage was about the Forbidden City and the third passage was about George Eastman and the Kodak camera. Once the reading passages were identified, the reading passages and the comprehension questions were processed into a Microsoft Word document and an appropriate number of copies were printed for the study.

In addition to the assessment tool, there were two instruments used for the two treatment groups. The first one is a four page handout consisting of background information about the topics in the reading comprehension test. Information about blood donating, the Forbidden City, and the Kodak Company was obtained from *Wikipedia* and only the background information about each topic was used for the handout. The length of the text varies from 306 words for blood donation, 338 words for information about the Kodak Company, to 616 words for the Forbidden City. The background information was given to the background knowledge group to study one week before the reading comprehension test. For the vocabulary knowledge group, a worksheet was made consisting of 30 vocabulary words chosen from the three selected passages in the reading comprehension test. The participants were asked to write in the definitions for each word (in either Chinese or English) and they had one week to complete the worksheet before the reading comprehension test.

3.3 Procedure

The data for this study was collected based on the participant's performance on the reading comprehension test. The participants in Group A had classes regularly and no special treatment was given. One week before the reading comprehension test was administered, the participants in Group B were given the handout to read about the background information on the selected topics from the test. During the same week, the participants in Group C were given the list of 30 vocabulary words to study. On the day of the study, the participants had 45 minutes to complete the reading comprehension test and at the end of the time limit, the tests were collected and graded by the researcher. Once the grading was completed, the scores were transferred to a database in SPSS for statistical analysis.

3.4 Analysis

The analysis used for this study was a one-way factorial ANOVA. The one-way factorial ANOVA design allows for comparisons of mean scores from multiple groups in a factorial design in order to decide whether the differences between means are due to chance or the effects of background knowledge or vocabulary knowledge. If a significant difference was found in the ANOVA, a Tukey's HSD (honestly significant difference) was used to determine which of the three groups significantly differs from each other.

3.5 Assumptions

Studies by Joshi and Aaron (2000) and Martin-Chang and Gould (2008) have shown that reading comprehension is strongly related to vocabulary knowledge. The more words a person knows, the easier it will be for him or her to decode and understand a text. Thus the assumption in this study was that Group C, which receives a list of vocabulary words to study, will perform significantly better than Group A, the control group. On the other hand, even though Group B in the study is familiar with the topic, the unfamiliar vocabulary words may affect the participants' ability to make inferences, making their understanding and comprehension of the reading passages more difficult. This is in accordance with the claim that background knowledge may not help improve reading comprehension, especially for longer, more difficult passages (Brantmeier, 2005; Hammadou, 2000; Pulido, 2004).

4 Results

The one-way analysis of variance (one-way ANOVA) was used to evaluate whether the results of the reading comprehension tests significantly differed between the three groups. First, the Levene's Test of Equality of Error Variances was used to check for homogeneity of variance among the three groups. In the Levene's Test of Equality of Error Variances, the Sig. value (0.324) was greater than our Alpha value (.05); therefore, we failed to reject the Null. Thus the groups were not significantly different from each other so the variances were equal (see Table 1).

F	df1	df2	Sig.
1.134	2	156	.324

Table 1: Levene's Test of Homogeneity of Variances

The mean scores for the control group and the two experimental groups were computed and are shown in Table 2.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Control	55	56.67	12.440	1.677	53.31	60.04
Background	55	57.80	10.368	1.398	55.00	60.60
Vocabulary	49	69.59	11.494	1.642	66.29	72.89
Total	159	61.04	12.757	1.012	59.05	63.04

Table 2: Dependent variable score

In the results of the one-way analysis of variance, the overall ANOVA was significant, $F(2,156) = 19.821$, $p = .000$. Since the p value is less than .05, we reject the null hypothesis (see Table 3). Because the overall F was significant, a post hoc test was used to evaluate pair-wise differences among the means.

Source	Sum of Square	Df	Mean Square	F	Sig.
Between Group	5209.946	2	2604.973	19.821	0.000
Within Group	20502.746	156	131.428		
Total	257120692	158			

Table 3: ANOVA summary table

A Post Hoc Test was used to determine if there were any significant differences in the reading comprehension scores between the three groups in the study. Using Tukey's HSD, a significant difference at the .05 alpha level was found between the vocabulary knowledge group and the control group. There was also a significant difference at the .05 alpha level between the vocabulary knowledge group and the background knowledge group. However, the reading comprehension score for the background knowledge group (Group B) was not significantly different from the score for the control group (see Table 4).

(I) Groups	(J) Groups	Mean Dif- ference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Upper Bound	Lower Bound
Control	Background	-1.127	2.186	.864	-6.30	4.05
	Vocabulary	-12.919*	2.252	.000	-18.25	-7.59
Background	Control	1.127	2.186	.864	-4.05	6.30
	Vocabulary	-11.792*	2.252	.000	-17.12	-6.46
Vocabulary	Control	12.919*	2.252	.000	7.59	18.25
	Background	11.792*	2.252	.000	6.46	17.12

Based on observed means, * $p < .05$

Table 4: Post hoc test summary

5 Discussion and conclusion

This current study tested the hypothesis that there would be a difference in the reading comprehension score when the participants were presented with one of the two variables: background knowledge and vocabulary knowledge. From the one-way ANOVA, several interesting findings were revealed. The study showed that vocabulary was significant in helping students understand the reading passages. The participants in the vocabulary knowledge group scored significantly higher than the control group and the background knowledge group. The findings were in accordance with the idea presented in Qian (2002) that the more vocabulary a reader knows, the better her or she will be at decoding and guessing the meaning of the texts. This implies that having vocabulary knowledge could increase the overall performance of a reading comprehension test for college EFL learners. The findings also confirmed that vocabulary and reading comprehension are strongly related (Joshi & Aaron, 2000; Martin-Chang & Gould, 2008).

In contrast to the vocabulary group, the background knowledge group did not score much higher on the reading comprehension test than the control group. This is not in accordance with the review of literature that prior knowledge aids in reading comprehension (Hammadou, 1991, 2000; Johnson, 1982; Lee, 1986). Instead, this result is similar to the claim that background knowledge

may not help improve reading comprehension in longer, more difficult passages (Brantmeier, 2005; Hammadou, 2000; Pulido, 2004). One explanation for this result might be that the participants in this study were only familiar with the topic but did not actually process any background knowledge such as terminologies and information that would actually help the participants make inferences. From this result, we can conclude that there is a difference between topic familiarity and background knowledge. The topic familiarity does not necessarily mean the background knowledge in a subject or topic. Background knowledge must include knowledge such as terminologies and information that would actually help the participants make inferences.

The results of the study show that vocabulary knowledge is more important when it comes to helping second language learners improve their reading comprehension as suggested by other researchers (Alderson, 2000; Nagy & Scott, 2000; Pressley, 2000). The background information about the topic provided to the background knowledge group fails to increase the comprehension level of the students. The participants in this group may only have topic familiarity, but they do not have the vocabulary knowledge to help them understand the reading passage. The results of this study show that background knowledge does not simply mean topic familiarity, but also includes knowledge in the terminologies and vocabularies involved in the topic.

5.1 Pedagogical implications

The significance of this study provides several implications for EFL teachers. Firstly, language teachers should be more aware of what they choose for their students to read in the reading classes, especially if the teachers are using English learning course books. In a foreign language learning classroom, reading in the reading class should not simply be just practice. Instead, it should be treated like reading in a native language, which is to gain knowledge. With proper textbooks and reading materials, students will be able to develop their vocabulary knowledge as well as background knowledge more effectively.

Secondly, although vocabulary instruction is very common in foreign language classrooms in Taiwan, most textbooks in General English only provide explicit instruction of relatively basic English vocabulary. Therefore, it is necessary for teachers to find ways to increase the student's vocabulary knowledge. For example, the teacher can provide or encourage students to do extensive reading beyond the classroom requirements. When students do extensive readings, they will be able to build new vocabulary as well as background knowledge in multiple subjects. The development of vocabulary and background knowledge will in turn help students with their reading comprehension (Joshi & Aaron, 2002; Martin-Chang & Gould, 2008; Qian, 2002). Another argument for extensive readings in the classrooms is that most language learners in Taiwan are not exposed to the target language outside the classroom as often as they would if they were in the United States or other English speaking countries. Therefore, it is even more important that in their leisure time, students spend time reading, not only for the enjoyment of the language, but also to gain vocabulary and background knowledge.

Finally, although this study showed how vocabulary knowledge can help students understand and improve their reading test scores, it is not suggested that language teachers pre-teach the vocabulary in all reading comprehension tests. Instead, the teacher should also spend time in class doing activities that develop the students' vocabulary knowledge from explicit vocabulary instruction or have students do more extensive reading. In addition, reading skills such as reading around the unknown words and making educated guesses about what a word means are still valuable and necessary skills in reading. After all, reading strategies are something that all language learners learn to use, especially when they encounter difficulties, but vocabulary is something that language learners acquire through the act of reading and studying. In everyday life, the former (reading strategies) are a useful skill, but the latter (vocabulary knowledge) should receive an equal amount of attention because reading comprehension is strongly related to vocabulary knowledge (Joshi & Aaron, 2002; Martin-Chang & Gould, 2008).

6 Limitations of the study

Due to the constraints of this study, the analysis was based on the participants' performance in one reading comprehension test only. In addition, the participants in the experimental groups received a single treatment (either the background information or the vocabulary list) one week before reading comprehension test. In order to have more reliable findings, perhaps a longitudinal study could be used to determine the effects of background knowledge and vocabulary knowledge on reading comprehension.

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