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Roles of Vocabulary Knowledge in English Reading Comprehension among Korean High School Students

한국 고등학생의 영어 읽기 이해에서
어휘 지식의 역할

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Roles of Vocabulary Knowledge in English Reading Comprehension among Korean High School Students

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Roles of Vocabulary Knowledge in English Reading Comprehension among Korean High School Students

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ABSTRACT

It has long be recognized that vocabulary knowledge plays an important role in L2 learnersô reading comprehension. In regard to vocabulary knowledge, there is an increasing consensus that it consists of vocabulary breadth and vocabulary depth, while it includes receptive and productive dimensions. In spite of the agreement, most studies have focused on receptive vocabulary knowledge as opposed to productive vocabulary knowledge and vocabulary depth.

The present study investigated the relationships among the three dimensions of vocabulary knowledge ï receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge ï according to the studentsô vocabulary proficiency. This study also attempted to explore the roles of vocabulary knowledge in reading comprehension according to their reading proficiency.

The participants of this study were 143 Korean high school students in the 10th grade. To evaluate their vocabulary knowledge and reading comprehension, a Vocabulary Levels Test (VLT), a Productive Vocabulary Levels Test (PVLT), a Word Associates Test (WAT), and a Reading Comprehension Test (RCT) were administered. Correlation and regression analyses were conducted in order to answer the research questions of this study.

The findings revealed that the three dimensions of vocabulary knowledge had strong relationships with one another. When the students were divided into two groups based on their VLT scores, the correlation of the PVLT with the WAT was

the highest within the high-level group, while that of the PVLT with the WAT was the lowest within the low-level group. This indicates that productive vocabulary and vocabulary depth increase as receptive vocabulary improves, and that they develop when a student has basic knowledge of receptive vocabulary at a certain level. It was also found that both vocabulary breadth and depth provided significant contribution to predicting reading comprehension. When the students were classified into two groups based on their RCT scores, the depth dimension showed the lowest predictability on reading comprehension for both the high- and low-level groups, implying that studentsô vocabulary depth is quite low irrespective of their reading proficiency. In addition, productive vocabulary knowledge had lower predictive power on reading comprehension for the high- rather than the low-level group, suggesting that even a student who has high reading skills is not familiar with using his word knowledge productively.

These findings offer specific information on understanding L2 vocabulary knowledge and its essential roles in reading comprehension. Vocabulary instruction and assessment needs to pay attention to the depth dimension as well as the breadth dimension. Knowing various aspects of word knowledge could lead to successful reading comprehension.

Key Words: L2 vocabulary knowledge, receptive vocabulary knowledge, productive vocabulary knowledge, depth of vocabulary knowledge, L2 reading comprehension

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CHAPTER 1.
INTRODUCTION

Vocabulary knowledge has been regarded as consisting of various aspects in second language research (Read, 1988, 1989; Wesche & Paribakht, 1996), and reading comprehension is affected by multiple dimensions of lexical knowledge (Laufer, 1996; Qian, 2002). The present study attempts to explore the relationships among the three dimensions of vocabulary knowledge − receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge, and to investigate the roles of vocabulary knowledge in the prediction of English reading comprehension depending on Korean high school studentsô proficiency. Section 1.1 describes the purpose of the study and Section 1.2 addresses the research questions. Finally, Section 1.3 provides the organization of this study.

1.1. Purpose of the Study

An essential component in language competence is vocabulary knowledge (Grabe, 1991). Vocabulary knowledge is commonly presumed to predict language proficiency to a great extent in a second or foreign language, and it has long been accepted, in the field of vocabulary and reading research, that vocabulary knowledge is instrumental in reading comprehension (e.g., Alderson, 2000; Laufer,

1996; Nation, 1990, 2001). Anderson and Freebody (1981) and Mezynski (1983) even claimed that comprehending texts is impossible without lexical knowledge.

In recent decades, second language vocabulary researchers have suggested various frameworks in order to explain what it means to know a word. In these frameworks, there is a growing agreement that vocabulary knowledge should be considered as a multidimensional construct rather than a single dimension (Qian & Schedl, 2004). In one way to see vocabulary knowledge, Qian (1999), Read (1989), and Wesche and Paribakht (1996) argue that vocabulary knowledge should at least consist of two aspects, which are vocabulary breadth or size, and depth or quality of vocabulary knowledge. Breadth of vocabulary knowledge refers to the total number of words for which a learner knows some aspects of meaning, whereas depth of vocabulary knowledge refers to how well the learner knows about each word.

In another way to divide vocabulary knowledge, Nation (2001) suggests that word knowledge should be regarded as including two dimensions: receptive or passive knowledge, and productive or active knowledge. Receptive vocabulary knowledge relates to whether the learner recognizes a wordôs meaning while listening or reading. In contrast, productive vocabulary knowledge relates to whether the learner can produce the correct forms of words in given contexts while speaking or writing.

In regard to the relationships between vocabulary knowledge and reading comprehension, it has been widely recognized that receptive vocabulary knowledge especially plays a vital role in L2 learners' reading comprehension in a

number of studies (Laufer, 1992, 1996; Liu & Nation, 1985; Stæhr, 2008). Compared to receptive vocabulary knowledge, there is still a lack of studies investigating the degree to which productive vocabulary knowledge contributes to reading abilities and exploring the role of depth dimension in the reading performance. This may be derived from a lack of recognition about the productive dimension and depth dimension in lexical knowledge, along with the difficulty of evaluating productive vocabulary knowledge and depth of vocabulary knowledge (Schmitt & McCarthy, 1997). However, this unbalanced tendency does not provide insightful information into the learnersô vocabulary knowledge since a great deal of vocabulary size does not necessarily lead to deeper knowledge, nor productive knowledge. Moreover, learners may have some difficulties in reading comprehension when they do not have sufficient knowledge of diverse aspects of words (McKeown & Beck, 2004).

Several studies dealing with both the breadth and depth dimensions show that vocabulary depth is as important as vocabulary breadth in predicting reading performance (Qian, 2002; Schmitt, 2010). In addition, in a few studies which dealt with receptive and productive word knowledge, the size of productive vocabulary knowledge could be an indicator of high language proficiency (Waring, 1997). These findings stress the necessity of studies involving productive vocabulary knowledge and vocabulary depth as well as receptive vocabulary knowledge in the vocabulary and reading research.

The present study thus attempts to examine the relationships among the three dimensions of vocabulary knowledge, namely, receptive vocabulary knowledge,

productive vocabulary knowledge and depth of vocabulary knowledge, and to investigate the roles of the three dimensions of vocabulary knowledge in predicting reading comprehension performance among EFL Korean high school students. It also aims to identify how different the relationships and roles of vocabulary knowledge are depending on the studentsô vocabulary and reading proficiency levels.

If this study proves that the three dimensions of vocabulary knowledge are closely related with one another, it will emphasize the importance of recognizing the multiple dimensions of vocabulary knowledge in vocabulary instruction and assessment. Furthermore, if vocabulary depth turns out to be associated with reading comprehension as much as vocabulary breadth, this study will also provide information of a well-balanced approach in vocabulary learning, which includes not only maximizing vocabulary size, but also enhancing in-depth knowledge about words. This harmonious approach between various aspects of vocabulary knowledge will ensure successful and efficient reading comprehension.

1.2. Research Questions

This study will deal with the three dimensions of vocabulary knowledge: receptive vocabulary knowledge, productive vocabulary knowledge and depth of

vocabulary knowledge. The aim of the present study is to explore the relationships among the three dimensions of vocabulary knowledge according to the studentsô vocabulary proficiency, and to assess the roles of vocabulary knowledge in reading comprehension according to their reading proficiency. For this purpose, the following research questions were proposed:

1. What are the relationships among the three dimensions of vocabulary knowledge (receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge) depending on the studentsô vocabulary proficiency?

2. To what extent do the three dimensions of vocabulary knowledge contribute to predicting reading comprehension depending on the studentsô reading proficiency?

1.3. Organization of the Thesis

The present study is organized into five chapters. Chapter 1 introduces the purpose of the study and addresses the research questions. Chapter 2 reviews previous literature on vocabulary knowledge and its role in reading comprehension. Chapter 3 describes the methodology and data analyses employed in the current

study. In Chapter 4, the results from the analyses are provided, and the findings in regard to the research questions are discussed. Finally, Chapter 5 concludes the study with a summary of the major findings and pedagogical implications, and offers the limitations of the study and suggestions for future research.

CHAPTER 2.
LITERATURE REVIEW

This chapter reviews the theoretical background relevant to the present study. Section 2.1 gives an overview of the definitions of vocabulary knowledge. Section 2.2 deals with the three main concepts for the current research, receptive and productive vocabulary knowledge and depth of vocabulary knowledge. Previous studies on the relationship between different dimensions of vocabulary knowledge are examined in Section 2.3. Finally, Section 2.4 addresses previous studies on the roles of vocabulary knowledge in reading comprehension.

2.1. Vocabulary Knowledge

Over the years, attempts to defining vocabulary knowledge have yielded a variety of terms, which shows the difficulties of explaining lexical competence (Cronbach, 1942; Nation, 1990, 2001; Richard, 1976; Vermeer, 2001). As an example of an early definition of word knowledge, Cronbach (1942) divided it into two categories: knowledge of word meaning (generalization, breadth of meaning and precision of meaning) and levels of accessibility to this knowledge (availability and application). This classification, however, lacks consideration of other aspects of vocabulary knowledge, such as spelling, pronunciation and

collocation.

Later, Richards (1976) provided a more comprehensive definition of vocabulary knowledge by suggesting the following aspects of lexical competence: frequency, register, syntax, derivation, association, semantic features, and polysemy. Since his categorization highlighted the multidimensional nature of vocabulary knowledge, it has been regarded as a general assumption for explaining word knowledge and served as the classic reference for the succeeding research.

In recent years, Vermeer (2001) defined words in terms of interrelated nodes in a network: thematically, phonologically, morphologically, conceptually, or sociolinguistically. He reported that the denser the network surrounding a word becomes, the larger the knowledge of that specific word becomes.

By combining various components, Nation (2001) suggested that vocabulary knowledge consists of three parts, each containing receptive and productive aspects: form, meaning and use. He explained the aspects of what is involved in knowing a word using a process model, which emphasizes the relationships between the parts. According to him, if a particular word is part of a learnerôs receptive vocabulary, it includes many aspects of knowledge and use. He also proposed that receptive learning and use is easier than productive learning and use for the reason that productive learning and use requires an extra amount of knowledge and practice. In addition, learners are not motivated, for the reason of socio-cultural background, to use knowledge productively. Table 2.1 shows what knowing a word means according to Nation (2001).

TABLE 2.1

What is Involved in Knowing a Word (Nation, 2001, p. 27)

Form	spoken	R	What does the word sound like?
		P	How is the word pronounced?
	written	R	What does the word look like?
		P	How is the word written and spelled?
	word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express meaning?
Meaning	form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	concept and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	associations	R	What other words does this make us think of?
		P	What other words could we use instead of this one?
Use	grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	constraints on use	R	Where, when, and how often would we expect to meet this word?
		P	Where, when, and how often can we use this word?

R = receptive knowledge, P = productive knowledge.

In spite of the disagreement in defining vocabulary knowledge, it is commonly agreed that vocabulary knowledge is composed of multiple dimensions rather than being a single construct. Among different definitions, it is generally accepted that vocabulary knowledge comprises at least two primary dimensions: vocabulary breadth and vocabulary depth (Lars, 2003; Qian, 1998; Read, 1988; Wesche & Paribakht, 1996). Another way to divide vocabulary knowledge is receptive and productive vocabulary knowledge (Nation, 1990).

2.2. Dimensions of Vocabulary Knowledge and Assessment Instruments

This section deals with two major classifications of vocabulary knowledge: one is breadth versus depth of vocabulary knowledge, and the other is receptive versus productive vocabulary knowledge.

Breadth of vocabulary, or vocabulary size, is defined as "the number of words for which the person knows at least some of the significant aspects of meaning" (Anderson & Freebody, 1981), while depth of vocabulary, or vocabulary quality, is defined as "how much one knows about each word and also how this knowledge of words is structured in one's mind" (Meara, 1996). With regard to this distinction between breadth and depth, they are not separate, but closely interconnected (Schmitt & Meara, 1997).

In terms of receptive and productive vocabulary, Nation (2001) described receptive, or passive vocabulary, as the lexicon that one is able to comprehend when listening and reading, whereas productive, or active vocabulary, is vocabulary used when writing and speaking. Since receptive and productive vocabulary knowledge is commonly considered as the domain of vocabulary breadth, this study will deal with the three dimensions of vocabulary knowledge, namely, receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge.

The following sections introduce related studies on what receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge mean and how to assess them.

2.2.1. Receptive Vocabulary Knowledge

Nation (2001, pp. 24-25) explained that receptive vocabulary use "involves perceiving the form of a word while listening or reading and retrieving its meaning". In other words, receptive vocabulary knowledge refers to whether learners recognize at least one aspect of a wordôs meaning, and therefore receptive vocabulary recognition is most commonly used when evaluating learnersô word knowledge. Receptive vocabulary knowledge is also called as passive or recognitional vocabulary knowledge.

The essential role of the number of words known by a learner has been

acknowledged by many researchers, including Meara (1996), who suggested that learners with a great vocabulary have more mastery of using the language than ones with a smaller vocabulary.

A number of studies have been conducted in order to estimate vocabulary size needed for various environments in both L1 and L2 contexts. English is known to have more than 54,000 word families and educated adult native speakers know about 20,000 words (Kim, 2008). Nation (1990, 2001) suggested that L2 learners are expected to know about 2000 high-frequency words to understand 90% of spoken discourse, and 3000 high-frequency words to understand university reading tasks. According to Laufer (1992), learners with a vocabulary size of 5000 words can comprehend unassisted reading materials, as that much knowledge of words covers 95% of words in a text. Nation and Waring (1997) argued that 3000-5000 word families make comprehension possible and 2000-3000 word families provide a basis for productive use in speaking and writing. These findings from research on vocabulary size reveal that a certain number of words is crucial for successful language use, and provide useful information about how many words should be known by learners for a variety of purposes.

Since much attention has been paid to vocabulary size, assessing learners' receptive vocabulary size has also received strong interest. The two most widely used tests are the Eurocentres Vocabulary Size Test (Meara & Buxton, 1987; Meara & Jones, 1990) and the Vocabulary Levels Test (Nation, 1983, 1990).

The Eurocentres Vocabulary Size Test (EVST) devised by Meara and his colleagues (Meara & Buxton, 1987; Meara & Jones, 1990) has a checklist format

in order to estimate a leanerôs vocabulary size, and is mostly administered by computer. It asks test-takers to indicate whether they know the meaning of the presented words on the computer screen by pressing a ‘Yes’ or ‘No’ button. Some of the words include nonsense words to adjust the scores if the test-takers are unfaithfully claiming to know these nonsense words. This test has been used as a valid placement test since it is easy to construct and administer (Read, 2000). Nation (1990), however, insisted that leaners’ knowledge of the tested words is not overtly demonstrated in the Yes/No tests.

The Vocabulary Levels Test (VLT) developed by Nation (1983, 1990) has been used most extensively as a diagnostic testing tool for either general or academic purposes for those from non-English backgrounds. This test assesses whether test-takers have initial and receptive knowledge of the most frequent meanings of the target words. It consists of five parts representing five levels of word frequency (2000, 3000, 5000, 10,000 word levels and the Academic word level). The 2000- and 3000-word levels, which are required for basic daily communication, include high-frequency words, while the 10,000-word level contains low-frequency words. The 5000-word level is the boundary between high- and low-frequency words and the Academic word level consists of academic words frequently used in university textbooks. At each word level, there are six test items each composed of six words and three definitions in order to prevent the test-taker from guessing in a decontextualized situation. The test-taker should choose a word for each definition and write the number of the word beside its definition, as illustrated in Figure 2.1.

1	apply		
2	elect	_____	choose by voting
3	jump	_____	become like water
4	manufacture	_____	make
5	melt		
6	threaten		

FIGURE 2.1

The Vocabulary Levels Test (Read, 2000)

Nation (1983) said that the test-taker has not mastered a specific level if he scores 12 points or less out of 18. Later on, the revised version (Schmitt, Schmitt, & Clapham, 2001) contains 30 items per level instead of 18 on the original, and a score of more than 26 points out of 30 shows that the particular level has been mastered.

The VLT is the most widely used and the most reliable standard test to assess L2 learners' receptive vocabulary size (Laufer, 1992), and it attained a reliability of .92 (Qian, 1999). Since a learnerôs vocabulary size can provide a representative explanation of his overall vocabulary state (Read, 2000), the VLT serves as an appropriate measurement for various placement and admission in language programs.

2.2.2. Productive Vocabulary Knowledge

Nation (2001, p. 25) defined that productive vocabulary use involves "wanting to express a meaning through speaking or writing and retrieving and producing the appropriate spoken or written word form". In other words, productive vocabulary knowledge represents whether learners have the ability to produce the correct forms of words in given contexts. Productive vocabulary is also called active vocabulary or possible use.

Productive vocabulary ability is not a yes/no phenomenon, but involves degrees of knowledge (Laufer & Nation, 1999). For instance, a learner may be able to make a sentence with an infrequent word when asked to do so, but avoid using it when left to his own devices and select to employ a more frequent word of a similar meaning. Such avoidance often reflects uncertainty of the word's usage and imperfect knowledge. The ability to use a word at one's free will is referred to as free productive vocabulary, while the ability to use a word when required to do so by a teacher as controlled productive vocabulary (Laufer & Paribakht, 1998). The main interest of the present study is in controlled productive vocabulary, and the term 'productive vocabulary knowledge' will be used to refer to controlled productive vocabulary in this study.

Generally, EFL learners' receptive vocabulary is known to be larger than his or her productive vocabulary (Laufer, 1998; Laufer & Paribakht, 1998; Waring, 1997). EFL learners are less exposed to productive vocabulary than to receptive

vocabulary, and they have little chance to produce the target language in their daily lives. Therefore, some researchers mentioned that learners need more time and effort to master productive vocabulary (Laufer & Nation, 1999; Nation, 2001). Moreover, it is much more complicated to evaluate productive vocabulary knowledge than it is to evaluate receptive vocabulary knowledge. One reason for this is that the word produced by a learner tends to be so context-specific that it is difficult to estimate the true size of the learner's productive vocabulary from any small sample (Meara & Fitzpatrick, 2000). Compared to tests for productive vocabulary, receptive vocabulary tests are known to be easier to design, conduct and score (Lee & Muncie, 2006; Meara & Fitzpatrick, 2000).

Nevertheless, there have been continual efforts to evaluate productive vocabulary knowledge. Productive vocabulary knowledge can be measured by various tests, such as the Lexical Frequency Profile (Laufer & Nation, 1995) and the Productive Vocabulary Levels Test (Laufer & Nation, 1999).

Laufer and Nation (1995) proposed the Lexical Frequency Profile (LFP) to assess free productive vocabulary. The LFP presents the relative proportion of words from different vocabulary frequency lists in the composition. For instance, in a composition composed of 200 different words, if 150 words belong to the first 1000 most frequent words, 20 to second, 20 to the Academic Word List, and 10 are not in any list, these figures are converted into percentages out of the total of 200 word types. Therefore, the LFP of the composition in this case is 75% - 10% - 10% - 5%. A computer program does all the calculations, and the LFP has proved to be a valid and reliable means of vocabulary knowledge in writing and to

differentiate between learners at various proficiency levels.

The Productive Vocabulary Levels Test (PVLT) developed by Laufer and Nation (1999) is a measure of controlled productive vocabulary. It is modeled on the Vocabulary Levels Test and consists of five levels: 2000, 3000, 5000, 10,000 word levels and the Academic word level. The test-taker should fill in a word in a clear sentence context, where the first letters are usually given to prevent the test-taker from writing a different word that is beyond the given level. The test format resembles the C-test to some degree, although the PVLT is not used in a paragraph but a sentence, as shown in Figure 2.2.

1. I'm glad we had this opp_____ to talk.
2. There are a doz_____ eggs in the basket.
3. Every working person must pay income t_____.

FIGURE 2.2

The Productive Vocabulary Levels Test (Laufer & Nation, 1999)

In the PVLT, there is little or no chance to guess accurately. If a test-taker does not know the target word, the only opportunity of guessing correctly is by making a word based on the spelling of the first letters of the word, which is nearly impossible (Webb, 2008). The PVLT is criticized, however, for going beyond single words to assess learnersô vocabulary knowledge, since some items require them to demonstrate collocational knowledge (Shin, Chon & Lee, 2011). In spite of its weakness, this test has been widely used to explore the relationship between

receptive and productive vocabulary knowledge, because it is easy to implement, score and analyze (Waring, 1997).

2.2.3. Depth of Vocabulary Knowledge

Tests of vocabulary breadth are not satisfactorily assessing how well certain words are known, particularly in the case of high frequency words that can be used in various meanings and uses (Read, 1993). Measures of vocabulary size disregard the fact that words can be known to a lesser or greater degree. Therefore, Wesche and Paribakht (1996) suggested that it is important to discover how well and how much a learner knows particular words, pointing out that vocabulary breadth tests only give rough comparative estimates of total vocabulary size. Consequently, the interest of vocabulary depth, or the quality of vocabulary knowledge, has been growing.

Various researchers integrated the depth dimension with lexical competence. For example, Henriksen (1999) claimed that lexical competence consists of three discrete, but connected, vocabulary dimensions: (a) a "partial-to-precise knowledge" dimension, (b) a "depth of knowledge" dimension, and (c) a "receptive-productive" dimension. The partial-to-precise knowledge dimension concerns different levels of word knowledge on a continuum, in which vocabulary size is situated toward the partial-knowledge end and knowledge of the specific meaning of words is located toward the precise-knowledge end. The depth of

knowledge dimension entails not only knowledge of a word's referential meaning (i.e., the extensional relations between concept and referent), but also its different intensional or sense relations to other words in the vocabulary, such as paradigmatic (antonymy, synonymy, hyponymy, gradation) and syntagmatic relations (collocational restrictions). Finally, the receptive-productive dimension is viewed as the ability to use the words in comprehension and production, and this knowledge is a continuum between having some knowledge of a word and having knowledge of how to use it in speaking or writing

Qian (2002) suggested four dimensions of vocabulary knowledge: vocabulary size, depth of vocabulary knowledge, lexical organization and automaticity of receptive-productive knowledge. In his framework, depth of vocabulary knowledge involves all lexical characteristics, such as phonemic, graphemic, morphemic, syntactic, semantic, collocational, and phraseological properties, as well as frequency and register. He mentioned that these four dimensions are not only intrinsically related, but also interact closely with one another in the basic procedures of vocabulary use and growth.

Taking into consideration that word knowledge includes more than a minimum knowledge of knowing its meaning, Qian (1999) proposed that six components comprise the depth of vocabulary knowledge as presented in Table 2.2.

TABLE 2.2

Components of Depth of Vocabulary Knowledge (Qian, 1999, p. 284)

(1) Pronunciation and spelling	How different forms of the word are pronounced and spelled
(2) Morphological properties	The word's stem, its capability of inflection, derivation and other word formation devices and its possible parts of speech
(3) Syntactic properties	The word's possible positions and its syntagmatic relations, including collocational relations, with other words in a sentence
(4) Meaning	Not only identification of the denotative meaning of a word in context, but also, where applicable, knowledge of connotations, as well as polysemy, antonymy, synonymy and other paradigmatic relations the word may have
(5) Register or discourse features	Including possible adherence to a stylistic, social, or regional variety and the field, mode and manner of discourse concerning the application of the word
(6) Frequency of the word	Whether this word is a commonly used word or one that appears only in some specialized texts

According to Qian (1999), depth of vocabulary knowledge contains various dimensions: from word meaning, register, frequency and syntactic properties to pronunciation, spelling and morphological properties. Similarly, Haastrup and Henriksen (2000) described vocabulary depth as ñthe knowledge of a wordôs different sense to relations to other words in the lexicon, e.g., paradigmatic (antonymy, synonymy, hyponymy, gradation) and syntagmatic (collocational restrictions)ò.

In a more recent study, Read (2004) defined depth of vocabulary knowledge as precision of meaning, comprehensive word knowledge and network knowledge. Based on his suggestion, precision of meaning implies the difference between having a limited, vague idea of what a word means and having a much more elaborated and specific knowledge of its meaning. Comprehensive word knowledge includes not only its semantic features but also its orthographic, phonological, syntactic, collocational and pragmatic characteristics, and network knowledge means the incorporation of the word into a lexical network in the mental lexicon, together with the ability to link it to ï and distinguish it from ï related words.

In consideration of all these definitions of vocabulary depth, the depth dimension fundamentally concerns knowledge of how relationships of a word to other words are represented in the learners' lexicon. Therefore, among the diverse constituents of depth of vocabulary knowledge, the present study will examine knowledge of associations between a word and other words. Particularly, learners' knowledge of paradigmatic, syntagmatic and analytic relations will be estimated in

measuring their depth of vocabulary knowledge.

There are several tools to measure the depth of vocabulary knowledge. The ideal test format to assess the depth dimension is an individual interview asking each learner how well he or she knows the target words (Read, 2001). However, that is a time-consuming method and will be influenced by the familiarity of the interviewer with the interviewee. Moreover, adult learners may hesitate in admitting that they do not know the target vocabulary (Read, 2000).

Another vocabulary depth measure, Wesche and Paribakht's (1996) Vocabulary Knowledge Scale (VKS) has been used as a reliable tool in a large number of studies. This test involves a self-report format which asks learners to check their level of knowledge on a scale of 1 to 5 as shown in Figure 2.3.

Self-report categories

I I don't remember having seen this word before.

II I have seen this word before, but I don't know what it means.

III I have seen this word before, and I think it means _____.
(synonym or translation)

IV I know this word. It means _____. (synonym or translation)

V I can use this word in a sentence. _____. (Write a sentence)
(If you do this section, please also do section IV.)

FIGURE 2.3

The Vocabulary Knowledge Scale (Wesche & Paribakht, 1996)

In the VKS, test-takers are required to choose the category that best describes their knowledge of the word on the list. Category I is chosen if the test-takers do not recognize the word at all, and Category II is selected if the word is recognized, but its meaning is unknown. Choosing Category III and IV requires the test-takers to demonstrate their knowledge of the word by offering a synonym or translation. Category V involves productive knowledge, which is distinct from other categories, and it requires the test-takers to write a sentence including the target word.

The VKS is easy and practical to conduct and score, and obtained fair reliability and validity through empirical studies (Read, 2000). However, some constraints have been presented. First, it does not assess other aspects of vocabulary knowledge, such as collocations and the various meanings of polysemous words. It is also questionable whether multiple dimensions of word knowledge can be described through a single linear scale (Read, 2000). In addition, Category V, which is a sentence-production task, measures overall language competence rather than vocabulary knowledge.

Another test widely used to assess depth of vocabulary knowledge is Read's (1993) Word Associates Test (WAT). This test was developed to measure how well learners know of various associations of the stimulus word with other words. Read (1993) suggested three types of relationship between a stimulus word and associate words, as shown in Table 2.3.

TABLE 2.3

The Relationship between the Stimulus Word and Associates (Read, 1993)

Paradigmatic relation	The associate is synonymous with or similar in meaning to the stimulus word. (Example: *edit* - *revise*)
Syntagmatic relation	The associate is a collocate of the stimulus word. (Example: *edit* - *film*)
Analytic relation	The associate represents one feature of the stimulus word and is likely to be found in its dictionary definition. (Example: *edit* - *publishing*)

The original version asks test-takers to choose three related words which are associated with the stimulus word in one of three different ways: paradigmatic, syntagmatic, and analytic relations. In a new version developed by Read (1998), test-takers are required to select four out of eight words, either expressing similar meaning to the target word or being used with it, as shown in Figure 2.4.

sudden							
beautiful	quick	surprising	thirsty	change	doctor	noise	school

FIGURE 2.4

The Word Associates Test (Read, 1998)

In this new version of the WAT, all of the stimulus words are high-frequency adjectives which have multiple meanings. The left box includes associates which are synonyms of the stimulus word, or represent one aspect of its meaning, whereas the right box contains associates which can collocate with the stimulus word. That is, the answers have a paradigmatic, syntagmatic and analytic relationship with the stimulus word. To reduce the possibility of guessing, three patterns are possible in choosing four associates: (a) one on the left and three on the right box, (b) two on the left and two on the right box, and (c) three on the left and one on the right box. Although the possibility of guessing was still present, this test turned out to be a practical means of measuring depth of vocabulary knowledge (Read, 2001) and has a high degree of internal consistency (Qian, 1999).

2.3. Relationship between Different Dimensions of Vocabulary Knowledge

As the attention to the multidimensional aspects of vocabulary knowledge has been growing, researchers have tried to explain how a learner's vocabulary breadth and depth are related in the mental lexicon (Akbarian, 2010; Schmitt & Meara, 1997). In a study on Japanese young adults, Schmitt and Meara (1997) investigated how two types of word knowledge – word associations and grammatical suffix knowledge – change over time both receptively and productively, and reported that learners' association and suffix knowledge are connected with their overall vocabulary size. As association knowledge is considered as one of the depth dimension, it could be interpreted as vocabulary size and depth are interrelated with each other.

In a recent study, Akbarian (2010) examined the relationship between vocabulary size and depth for 112 Iranian learners of English for specific and academic purposes. He employed the Vocabulary Levels Test (Schmitt, Schmitt & Clapham, 2001) for a vocabulary size test and the Word Associates Test (Read, 1993) for a vocabulary depth test. The findings from simple regression analyses show that there is a great deal of common shared variance for the participants (R^2 = .746). However, when they were separated into two proficiency groups, the shared variance for the high proficiency group (R^2 = .804) was higher than that for the low proficiency group (R^2 = .464), suggesting that vocabulary size and depth

might overlap one another to a large extent, especially as the learners' proficiency increases.

With regard to the relationship between receptive and productive vocabulary size, the size of receptive vocabulary is generally known to be greater than that of productive vocabulary (Laufer & Paribakht, 1998; Waring, 1997; Webb, 2008). In Webb's (2008) experiment, receptive vocabulary size turned out to be larger than productive vocabulary size in each of the word frequency bands, with the gap between receptive and productive vocabulary knowledge growing as the frequency of the words decreased. The findings also implied that receptive vocabulary size might give suggestions of productive vocabulary size, that is, learners with a greater receptive vocabulary tend to know more of those words productively than learners with a smaller receptive vocabulary. Similarly, in a study of female Japanese learners, Waring (1997) mentioned that as learners' proficiency developed, the difference between receptive and productive vocabulary knowledge was narrowed to some degree, but still remained high.

Laufer and Paribakht (1998) explored the relationships among the three dimensions of vocabulary knowledge, that is, passive knowledge, controlled productive knowledge (i.e., words learners can use if asked) and free productive knowledge (i.e., words learners voluntarily choose), dividing productive knowledge into two dimensions. They found that the three types of vocabulary knowledge expanded at different rates, showing that the productive, especially free productive, vocabulary increased more slowly and less predictably than did passive vocabulary.

While contemplating the reason why the size of productive vocabulary seems smaller than that of receptive vocabulary, some researchers mentioned that productive vocabulary requires more time and effort for mastery (Laufer & Paribakht, 1998; Nation, 2001). In addition, productive vocabulary can be revealed only when learners are pushed to use it (Laufer, 1998).

To summarize, many studies suggest that various dimensions of vocabulary knowledge are interrelated and develop interdependently to some extent. However, the dimensions of depth and productive knowledge have received less interest compared to the dimension of receptive knowledge. According to Qian (1999), learnersô vocabulary depth can increase when they have certain level of vocabulary size. Therefore, it is of great importance to assess all receptive knowledge, productive knowledge and depth knowledge, and to explore the relationships among the three dimensions of vocabulary knowledge.

2.4. Roles of Vocabulary Knowledge in Reading Comprehension

It has long been acknowledged that vocabulary knowledge plays significant roles in reading comprehension, indicating that a great amount of vocabulary knowledge is essential for successful reading comprehension (Alderson, 2000; Meara, 1996; Mezynski, 1983; Read, 2000). The importance of both breadth and

depth of vocabulary knowledge in reading comprehension has generally been recognized by L1 reading researchers (Anderson & Freebody, 1981; Nation & Snowling, 2004; Ouellette, 2006; Zhang & Anual, 2008).

Within several studies which investigated the effects of vocabulary knowledge on reading comprehension for monolingual and bilingual children, Zhang and Anual (2008) explored the role of vocabulary size in reading comprehension among 37 fourth-grade secondary students. The Vocabulary Levels Test was used to evaluate students' vocabulary size, and it was found that vocabulary knowledge at the 2000- and 3000-word levels was correlated to reading comprehension.

Nation and Snowling (2004) examined the development of reading skills for 72 children at two time periods in a longitudinal study. The results revealed that the breadth of vocabulary knowledge was more predictive of the variance (25.2%) in reading comprehension than depth (15.1%) when participants were 8.5 years old. When they were 13 years old, however, breadth and depth of vocabulary were equally important in predicting reading comprehension. Similarly, in a study of 60 fourth-grade students, Ouellette (2006) suggested that vocabulary depth as well as vocabulary size significantly contributes to predicting reading outcomes.

With regard to studies including learners from L2 backgrounds, most studies have been concerned with L2 vocabulary breadth, and few studies have reported on the relationship between L2 vocabulary depth and L2 reading comprehension. That is, most attention has been paid to the role of L2 vocabulary size in L2 reading comprehension performance (Koda, 1989; Laufer, 1992, 1996; Liu & Nation, 1985). For instance, Koda (1989) worked with 24 college students enrolled

in a Japanese program, and reported that L2 vocabulary size was most highly correlated with L2 reading comprehension among the variables.

In a similar way, Laufer (1992) reported relatively high correlations between L2 vocabulary size and L2 reading comprehension in a study of 92 university students whose L1 was either Arabic or Hebrew. He used two vocabulary tests; The Vocabulary Levels Test (VLT) and the Eurocentres Vocabulary Size Test (EVST). The correlation between the VLT and the reading comprehension test was .50, and between the EVST and the reading comprehension test was .75.

In Stæhr's (2008) research on 88 Danish learners of English from lower secondary education, learners' L2 receptive vocabulary size was shown to be closely related to their L2 reading ability, with a correlation of .83. Using four levels of the Vocabulary Levels Test as a receptive vocabulary size test (the 2000-, 3000-, 5000- and the 10,000-word levels), it also suggested that the 2000-word level is an important learning goal for the low-level EFL learners.

On the other hand, there have been fewer studies examining the relationship between L2 vocabulary depth and L2 reading comprehension. This is probably because depth of vocabulary knowledge is more complex to assess than is vocabulary size, and therefore vocabulary size measures are relatively more developed compared to vocabulary depth measures (Schmitt & McCarthy, 1997). However, it was also agreed that vocabulary depth, as well as vocabulary breadth, makes an important contribution to successful reading comprehension (Choi, 2012; Jeon, 2011; Qian, 2002).

For example, Qian (2002) investigated the roles of breadth and depth of

vocabulary knowledge in reading comprehension among 217 adult ESL learners in Canada. The Vocabulary Levels Test for a size test, the Depth of Vocabulary Knowledge Test adapted from the Word Associates Test for three elements of a depth test (synonymy, polysemy and collocation) and a TOEFL reading comprehension subtest were used to evaluate the variables. It was found that vocabulary size, depth and reading comprehension are highly correlated, and that depth of vocabulary knowledge is as important as vocabulary size in predicting academic reading performance, explaining 59% of the variance of reading comprehension.

In Korea, Choi (2012) worked with 98 EFL high school students in the 11th grade using the Vocabulary Levels Test (VLT), the Word Associates Test (WAT) and an additional test designed by the researcher, the Vocabulary Knowledge in a Yes/No Format (VKS), with the aim to reduce possible guessing effects on the WAT. The results revealed that both the VLT and the WAT were significantly associated with reading comprehension, producing a correlation of .765 and .712, and that the VLT and the WAT considerably predicted 58.5% and 50.6% of the variance in reading comprehension respectively. The relationship between vocabulary depth and reading comprehension became stronger with a correlation of .790 when an exploratory test of the VKS as a depth measure was adopted.

Another study in Korea is Jeonôs (2011) research, which dealt with 129 EFL high school students in the 11th grade. The results show that breadth and depth of vocabulary knowledge explained 21% and 28% of the reading comprehension variance respectively. Moreover, both breadth and depth of vocabulary knowledge

became more important with higher reading proficiency.

To summarize, the essential role of vocabulary knowledge in reading comprehension has been well accepted in both first language and second language situations. Unfortunately, most research has been devoted to the dimension of breadth, with less attention paid to the dimension of depth. Furthermore, most previous studies have measured one aspect of vocabulary breadth, which is, receptive vocabulary knowledge, neglecting to consider an equally important aspect, productive vocabulary knowledge.

The present research suggests that vocabulary depth and productive vocabulary knowledge as well as receptive vocabulary knowledge need to be taken into account in vocabulary assessment. In addition, differences resulting from students' proficiency levels will be explored in this study. Therefore, the present study aims to identify a) the relationships among receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge depending on the students' vocabulary proficiency, and b) the contribution made by the three dimensions of vocabulary knowledge in predicting reading comprehension depending on the students' reading proficiency, among Korean high school students in an EFL setting.

CHAPTER 3.
METHODOLOGY

The principal goal of this study was to investigate how various dimensions of vocabulary knowledge are related to one another and how vocabulary knowledge has an effect on English reading comprehension among Korean high school students. For this purpose, the current study employed several test measures to assess the participants' L2 vocabulary knowledge and L2 reading comprehension. This chapter outlines the methodological approach and research design for the present study. Section 3.1 provides details on the participants, and Section 3.2 reports the pre-test conducted before the main study. Section 3.3 presents the instruments employed in the main study, and Section 3.4 explains the data collection procedures used for this study. Finally, Section 3.5 describes how the data were analyzed.

3.1. Participants

The participants of this study were 143 Korean students in the 10th grade from three high schools in Gyeonggi Province in South Korea. It first involved 150 students but seven students who did not complete all the required tests were excluded from the analyses.

According to the background questionnaire, the average age of students was approximately 17 years. Thirty-four students out of 143 had experiences of living in foreign countries where English was used as a first or second language, for periods ranging from 3 months to 10 years. The participants consisted of 92 female (64%) and 51 male (36%) students. They seemed to be quite motivated in their scholastic achievements and have advanced or upper-intermediate proficiency level in English, based on their scores on several school examinations.

3.2. Pre-test

The test instruments employed in this study turned out to be quite valid and reliable in previous studies. However, a pre-test was carried out on native speakers of English in order to make sure that all the test items were appropriate before being conducted on the subjects in the main study.

Three native English speakers pre-tested four tests: the Vocabulary Levels Test (10 items from the 2000-word level), the Productive Vocabulary Levels Test (18 items from the 2000-word level), the Word Associates Test (40 items), and the Reading Comprehension Test (15 items extracted from 2011 Nationwide Unified Academic Ability Evaluation). Among the four tests, they failed to choose the intended associates in some of the items on the WAT. After the pre-test, the native speakers were interviewed and their comments on the test items were reflected in

the revision of the tests. They also checked whether the time limit for completing the tests and the difficulty of the tests were appropriate for high school students. The tests were reviewed until the native speakers agreed that all the test items were clear and adequate.

3.3. Instruments

Four sets of instruments were employed: (a) a Vocabulary Levels Test (VLT), for measuring receptive vocabulary knowledge, (b) a Productive Vocabulary Levels Test (PVLT), for measuring productive vocabulary knowledge, (c) a Word Associates Test (WAT), for measuring depth of vocabulary knowledge, and (d) a Reading Comprehension Test (RCT), for measuring reading comprehension.

3.3.1. Vocabulary Levels Test

The Vocabulary Levels Test Version 2 (Schmitt, Schmitt & Clapham, 2001) was used to evaluate receptive vocabulary knowledge, since it has been recognized as one of the most appropriate measures to estimate L2 learnersô receptive vocabulary size (Laufer, 1992, 1996; Laufer & Paribakht, 1998; Qian, 1999, 2002).

This format tests the non-specific vocabulary which is not given in a text, and

allows more precise measurement of text-independent vocabulary knowledge. In fact, according to Watanabe (1997), if vocabulary would be tested in a context, higher scores could be achieved than testing words in isolation, because the test-takers can guess the meanings from the context.

The VLT consists of five parts, according to word frequency level: the 2000, 3000, 5000, 10,000 word levels and the Academic word level. For the current study, however, only the 2000-word level was used based on the participants' vocabulary levels. According to the Korean English Vocabulary Guide of the 7th National Curriculum as shown in Table 3.1, high school students are required to master a vocabulary size of 1700 by the time they reach 10th grade. Thus, testing the 2000-word level was appropriate to assess the 10th grade high school students' receptive vocabulary knowledge.

TABLE 3.1

Vocabulary Size in High School Courses (Kim, 2008)

Course	The Size of Entire Vocabulary
High School English	1700
English I	2300
English II	3000
English Reading	2000
English Conversation	1200
English Composition	1200

In the VLT, there were 10 items involving six words with three definitions each. The participants were required to choose a word for each definition and write the relevant number. One point was awarded for each correct item, with a maximum possible score of 30 points for this test. A sample item is presented in Figure 3.1.

1	copy		
2	event	_____	end or highest point
3	motor	_____	this moves a car
4	pity	_____	thing made to be like another
5	profit		
6	tip		

FIGURE 3.1

Vocabulary Levels Test (VLT)

3.3.2. Productive Vocabulary Levels Test

The Productive Vocabulary Levels Test (Laufer & Nation, 1999) is a measure of controlled productive ability. The test format is modeled on the Vocabulary Levels Test, in the way that it employs the same word frequency bands and the same items. Thus, the PVLT also consists of five parts: the 2000, 3000, 5000, 10,000 word levels and the Academic word level. In the present study, however,

only the 2000-word level was used in consideration of the participants' vocabulary levels.

For each item, a meaningful sentence context is given and the first letters of the target word are presented. The test-takers should write the missing word in each sentence, as shown in Figure 3.2.

The pirates buried the treas_____ on a desert island.

FIGURE 3.2

Productive Vocabulary Levels Test (PVLT)

The first letters prevent the test-takers from writing another word, which would be semantically suitable in the sentence, but which is beyond the given level. The number of letters presented for each word was determined by eliminating possible alternatives to the target word. For instance, in the given context, if two possible words could start with two letters, an extra letter was attached to avoid this possibility. The length of the underlined space at the end of the imperfect word does not indicate the number of letters required to complete it.

The scoring is in terms of correct (1 point) or incorrect/blank (0 point). Spelling mistakes were marked as incorrect, because knowing a word involves knowing its spelling (Nation, 2001). An item was considered correct when it is used in the wrong grammatical form, for example, stem instead of the past tense (e.g., "introduce" instead of "introduced"). There were 18 items in the PVLT,

therefore the maximum possible score for this test was 18 points.

3.3.3. Word Associates Test

The Word Associates Test (WAT) developed by Read (1993, 1998) was used to assess the depth of vocabulary knowledge. The reliability of the test reached .92 (Read, 1993) and the split-half reliability of the test was .89 (Qian, 2002). The WAT is quite an appropriate testing tool since there is a minimal amount of reading and the first languages of the test-takers have little influence on their performance (Greidanu et al., 2004). In addition, it is reasonably easy to conduct and score the WAT.

The WAT evaluates three vocabulary aspects: synonymy, polysemy, and collocation. Each item in the WAT comprises one stimulus word, and two boxes, each including four words. Most of the stimulus words are general academic adjectives. Among the four words in the left box, test-takers are required to choose one to three words which are synonymous to the stimulus words. Among four words in the right box, on the other hand, they are supposed to select one to three words which can collocate with the stimulus word. There are always four correct answers in each item and this arrangement of answers effectively lowers the possibilities of guessing. The WAT is originally composed of 40 items. For this study, however, 30 items were carefully chosen out of the original 40 stimulus words based on the results from the pre-test, that is, disagreement on certain items

by the native speakers, and time constraints for class hours.

In scoring, one point was awarded for each word correctly chosen. The maximum possible score, therefore, was 120 points for the 30 items. An example item is presented in Figure 3.3.

beautiful							
enjoyable	expensive	free	loud	education	face	music	weather

FIGURE 3.3

Word Associates Test (WAT)

3.3.4. Reading Comprehension Test

The purpose of this study was to explore the roles of vocabulary knowledge in predicting reading comprehension. The Reading Comprehension Test (RCT) was used to assess the participants' performance on reading comprehension. In this study, 15 reading items, extracted from 2011 Nationwide Unified Academic Ability Evaluation, were adopted. There are several reasons in employing the Nationwide Unified Academic Ability Evaluation. First of all, this test was devised in collaboration with 15 Municipal and Provincial Offices of Education. Therefore, this is well-established and had gone through a close validation process. Second, the participants were familiar with this test, since it had a similar test

format to the College Scholastic Ability Test.

The participants were required to answer the correct responses to questions after reading passages (See appendix 4 for a full version of the RCT). For scoring, one point for each right answer was awarded, and the maximum possible score for the RCT was 15 points.

3.4. Procedures

In order to collect the data, the instruments were administered in two different sessions. The interval between sessions was three or four days. Before the first test session, the participants were informed of the purpose of the study. In addition, a detailed explanation of the test formats and an example item were provided before taking each test. Table 3.2 summarizes the test procedures for the data collection.

TABLE 3.2

Data Collection Procedures

Session	Tests	Number of Items	Time (min)
1	VLT	10	10
	WAT	30	30
2	PVLT	18	10
	RCT	15	25

The three vocabulary tests and one reading comprehension test were conducted across two testing sessions: the VLT and the WAT, followed by the PVLT and the RCT. All tests were timed and administered to six classes of 25 to 35 students by three teachers well-informed of the instructions. The time limit for each test was carefully decided based on the constraints of the class hours, so that students could complete each test with minimal pressure.

3.5. Data Analysis

The main purposes of the present study were to find out: (a) the correlations between receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge depending on the students' vocabulary proficiency, and (b) the extent to which the three dimensions of vocabulary knowledge can contribute to the prediction of reading comprehension depending on the students' reading proficiency.

Descriptive statistics (means, standard deviations, obtained score ranges, and percentages of correct answers) were calculated for all measures. In addition, a reliability coefficient was computed to identify how reliable the items in each of the materials were. For the first research question, Pearson product-moment correlation analyses and simple regression analyses were conducted to examine the

relationship among the variables. For the second research question, correlation analyses and multiple regression analyses were carried out to investigate the roles of vocabulary knowledge in predicting reading comprehension. SPSS (a Statistical Package for Social Studies) was used as the main statistical program for the analyses.

CHAPTER 4.
RESULTS AND DISCUSSION

This chapter presents the results of the study and discusses the research questions based on the findings. Section 4.1 provides descriptive statistics of all the tests employed. Section 4.2 deals with the findings on the relationship between receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge. Roles of the three dimensions of vocabulary knowledge in explaining reading comprehension are presented in Section 4.3.

4.1. Descriptive Statistics

Table 4.1 shows the means, standard deviations, MPS (Maximum Possible Score), score ranges, and percentages converted from the raw scores (percentage of correct answers) of the VLT, the PVLT, the WAT and the RCT.

TABLE 4.1

Descriptive Analysis of Four Tests

	M□	SD	MPS	Score Range	Correct Answers (%)
VLT	26.23	4.855	30	(6, 30)	87.4%
PVLT	12.05	3.857	18	(3, 18)	66.9%
WAT	84.36	15.078	120	(33, 107)	70.3%
RCT	12.64	2.852	15	(4, 15)	84.3%

MPS: Maximum possible score, N=143

As can be seen in Table 4.1, the percentage of correct answers on the VLT was the highest among the four tests, followed by the RCT and the WAT. The percentage of correct answers on the PVLT was the lowest, almost 20% points less than on the VLT. The possible reason for the high percentages of correct answers on the VLT and the RCT may be the students' familiarity with the test formats. In other words, students are accustomed to choose a word for each definition, which the VLT required them to do. The RCT had a format similar to the mock test for the College Scholastic Ability Test, which students had been exposed to in many circumstances. In contrast, the lowest percentage of correct answers on the PVLT may imply that there exists a big difference between the students' receptive and productive vocabulary knowledge.

The percentage of correct answers for the WAT was also quite low, which indicates that the depth test of vocabulary knowledge was difficult for the students.

This may be because students were not familiar with this type of test format. Moreover, the WAT required students to select four associates of the stimulus word rather than to simply supply a definition. Even though they know the primary meaning of the target words, there might be a chance that they do not possess a deeper knowledge of the words.

In addition, reliability analyses were carried out to check the internal consistency of each test. Table 4.2 presents that the estimates of internal consistency reliability for all the tests were appropriate.

TABLE 4.2

Internal Consistency Reliability of the VLT, PVLT, WAT and RCT

Test	Cronbachôs Alpha Reliability Coefficient
VLT	.887
PVLT	.819
WAT	.922
RCT	.828

4.2. Relationship between Different Dimensions of Vocabulary Knowledge

In order to evaluate the relationship between receptive vocabulary knowledge,

productive vocabulary knowledge and depth of vocabulary knowledge, correlation analyses were conducted between the VLT, the PVLT and the WAT. In addition, simple regression analyses were carried out to investigate how much one dimension of vocabulary knowledge could predict other kinds of vocabulary knowledge. Finally, in order to see the differences according to the studentsô vocabulary proficiency levels, another correlation and simple regression analyses were performed after dividing them into two groups.

4.2.1. Correlation Analyses

The result of the correlation analyses among the VLT, the PVLT and the WAT is presented in Table 4.3.

TABLE 4.3

Correlations among the VLT, PVLT and WAT

Correlation	VLT	PVLT	WAT
VLT	-	0.653*	0.736*
PVLT		-	0.679*
WAT			-

N=143, *p<.05

As shown in Table 4.3, the interrelations among the variables were fairly

strong. It was revealed that there is the highest correlation between the VLT and the WAT, producing a correlation of .736. In addition, there existed a strong relationship between the PVLT and the WAT (.679). Relatively high correlations of the VLT with the WAT and the PVLT with the WAT indicate that vocabulary size, both receptive and productive knowledge, and vocabulary depth are related to each other to a significant extent. A strong association between the VLT and the PVLT was also found, with a correlation coefficient of .653, suggesting that receptive and productive vocabulary knowledge are considerably interrelated with each other.

Overall, the three tests had strong relationships with one another, supporting the claims made in previous studies (e.g., Akbarian, 2010; Schmitt & Meara, 1997). This means that as one of the three vocabulary knowledge increases, the other vocabulary knowledge also develops. In other words, one who possesses large receptive vocabulary knowledge has more productive and deeper vocabulary knowledge than one who does not.

4.2.2. Regression Analyses

Simple regression analyses were conducted to investigate the predictive values among the three dimensions of vocabulary knowledge. The analyses show how well one dimension of vocabulary knowledge can explain other kinds of vocabulary knowledge. Table 4.4 summarizes the results from simple regression analyses with the three variables.

TABLE 4.4

Simple Regression Analyses among the VLT, PVLT and WAT

Model	R^2
VLT & PVLT	0.426
PVLT & WAT	0.461
WAT & VLT	0.541

First, in a model for the VLT and the PVLT, the VLT considerably predicted 42.6% of the variance in the PVLT and vice versa. This means that students' receptive and productive vocabulary knowledge actually overlap one another to a large extent. Second, in a model for the PVLT and the WAT, the PVLT accounted for 46.1% of the WAT variance and vice versa. This predictability indicates that there is a great deal of overlap between productive vocabulary knowledge and depth of vocabulary knowledge. Finally, in a model for the WAT and the VAT, the WAT explained 54.1% of the VLT variance and vice versa. The predictive power between the WAT and the VLT is the highest among the three simple regression analysis models, which reveals that the explanatory power between vocabulary depth and receptive vocabulary knowledge is the highest among the three dimensions of vocabulary knowledge. In a similar study by Akbarian (2010), the shared variance between the VLT and the WAT was very high with about 75%, suggesting that vocabulary size and depth might be accounted for by the same factors, to a great extent, in the process of vocabulary development.

4.2.3. Analyses According to Vocabulary Proficiency Levels

In order to investigate whether the relationship between the three dimensions of vocabulary knowledge varies according to the learners' vocabulary proficiency, the participants were divided into two groups based on their VLT scores, because receptive vocabulary knowledge is generally considered as the basic aspect of vocabulary knowledge. The VLT contains 30 items per level and a score of more than 26 points out of 30 shows that the particular level has been mastered. Therefore, in this study, 103 students who scored above 26 points were categorized as a high-level group, while the 40 students who scored below 26 points were classified as a low-level group.

An independent samples t-test was carried out to check if the difference between the high- and low-level groups was statistically significant. The result presented in Table 4.5 proves that the two groups were statistically different.

TABLE 4.5

Independent Samples t-test of the VLT

	t	*df*	*Sig.*
High- and Low-level Groups	9.561	40.865	.000

Table 4.6 shows the descriptive statistics for the four tests of high- and low-level groups respectively. The mean scores of the VLT for high- and low-level

groups are 28.56 and 20.23 out of 30, respectively. When the mean scores are converted to percentages, the high-level group received 95.2% and the low-level group got 67.4%.

TABLE 4.6

Descriptive Analysis According to Vocabulary Proficiency Levels

		VLT	PVLT	WAT	RCT
High-level Group (N=103)	Mean	28.56	13.54	90.13	13.86
	SD	1.348	3.130	9.450	1.541
	Correct Answers (%)	95.2%	75.2%	75.1%	92.4%
Low-level Group (N=40)	Mean	20.23	8.20	69.53	9.50
	SD	5.451	2.729	16.681	3.055
	Correct Answers (%)	67.4%	45.6%	57.9%	63.3%

Correlation analyses were carried out in order to determine the degree of correlations among the VLT, the PVLT and the WAT across the vocabulary proficiency groups. The results of the correlation analyses for the high-level group are presented in Table 4.7.

TABLE 4.7

Correlations among the VLT, PVLT and WAT

for the High-level Group

Correlation	VLT	PVLT	WAT
VLT	-	0.498*	0.439*
PVLT		-	0.591*
WAT			-

N=103, *p<.05

Overall, significant correlations existed among all the variables for the high-level group, although the degree of correlations varied a little. The relationship between the PVLT and the WAT was the highest, producing a correlation of .591. The correlation between the VLT and the PVLT (.498) was slightly higher than that of the VLT and the WAT (.439). The results reveal that receptive vocabulary size, productive vocabulary size and vocabulary depth are related to a significant extent in the group of high-level students.

In comparison to the correlations for the whole participants, it is worth noting that the correlation of the VLT with the WAT for the whole participants was the highest among the variables, while that of the VLT with the WAT for the high-level group was the lowest. This implies that even a student who has a large vocabulary size may not possess a deeper knowledge of vocabulary. In addition, the fact that the correlation of the PVLT and the WAT was the highest for the

high-level group may indicate that both productive vocabulary knowledge and vocabulary depth increase as receptive vocabulary knowledge develops, considering that the high-level group students gained relatively high VLT scores.

In order to determine the predictive power among the variables for the high-level group, simple regression analyses were conducted. Table 4.8 summarizes the results from the simple regression analyses for the high-level group.

TABLE 4.8

Simple Regression Analyses among the VLT, PVLT and WAT for the High-level Group

Model	R^2
VLT & PVLT	0.248
PVLT & WAT	0.349
WAT & VLT	0.193

For the high-level group, the VLT predicted 24.8% of the variance in the PVLT and vice versa. The PVLT accounted for 34.9% of the WAT variance, while the WAT explained 19.3% of the VLT variance and vice versa. The predictive power between the PVLT and the WAT is the highest among the three simple regression analysis models, suggesting that the explanatory power between productive vocabulary knowledge and vocabulary depth is the highest among the three dimensions of vocabulary knowledge for the high-level group students.

With regard to the low-level group, the results of the correlation analyses among the VLT, the PVLT and the WAT are presented in Table 4.9. According to the results, all the variables turned out to have positive correlations for the low-level group. The correlation of the VLT with the WAT was the highest (.600), which is the same as the result for the whole group. The relationship between the VLT and the PVLT (.411) was the second highest, followed by that of the PVLT and the WAT (.364).

TABLE 4.9

Correlations among the VLT, PVLT and WAT for the Low-level Group

Correlation	VLT	PVLT	WAT
VLT	-	0.411*	0.600*
PVLT		-	0.364*
WAT			-

N=40, *p<.05

One thing to be considered here is that the degree of correlations for the low-level group has the reverse order to that of the high-level group. The low-level group students showed relatively weak correlations of the PVLT with the WAT and the VLT with the PVLT compared to the high-level group students. Considering that the low-level group students gained relatively low VLT scores, it

may imply that productive vocabulary knowledge and vocabulary depth can be expanded when a student has receptive vocabulary knowledge to a certain degree.

Simple regression analyses were conducted to determine the predictive power among the three tests for the low-level group. The results of the simple regression analyses for the low-level group are presented in Table 4.10.

TABLE 4.10

Simple Regression Analyses among the VLT, PVLT and WAT for the Low-level Group

Model	R^2
VLT & PVLT	0.169
PVLT & WAT	0.133
WAT & VLT	0.359

The results from the low-level group show that the VLT accounted for 16.9% of the PVLT variance, while the PVLT predicted 13.3% of the WAT variance and vice versa. The WAT explained 35.9% of the VLT variance and vice versa, which is the highest among the variables in the low-level group. This indicates that there is a considerable overlap between receptive vocabulary knowledge and vocabulary depth for the low-level group students.

4.3. Roles of Vocabulary Knowledge in Reading Comprehension

In order to determine the relationship between the three vocabulary knowledge and reading comprehension, correlation analyses were conducted between the RCT, the VLT, the PVLT and the WAT. In addition, in order to investigate the roles of vocabulary knowledge in predicting reading comprehension, multiple regression analyses were performed among the variables. Finally, further regression analyses were performed after dividing students into two groups in order to see the differences according to their reading proficiency levels.

4.3.1. Correlation Analyses

The result of correlation analyses between the RCT, the VLT, the PVLT and the WAT is presented in Table 4.11.

TABLE 4.11

Correlations among the RCT, VLT, PVLT and WAT

Correlation	VLT	PVLT	WAT
RCT	0.792^{*}	0.716^{*}	0.722^{*}

N=143, $^{*}p<.05$

The correlation coefficients between the RCT and the variables turned out to be all significant. The association between the RCT and the VLT was the strongest, producing a correlation of .792. The correlation between the RCT and the WAT was the second highest, with a correlation coefficient of .722. A close relationship was also found between the RCT and the PVLT (.716). These results imply that productive vocabulary size and vocabulary depth, as well as receptive vocabulary size, are strongly related to reading comprehension.

4.3.2. Regression Analyses

Multiple regression analyses were carried out to determine whether, and to what extent, the three dimensions of vocabulary knowledge could predict reading comprehension. The VLT, the PVLT and the WAT represented the independent variables and the RCT represented the dependent variable. Table 4.12 summarizes the results from multiple regression analyses with a) each measure, and b) combinations of the three measures.

TABLE 4.12

R-Square of the Correlation Coefficient

between Each Predictor Variable and the RCT

Model	R^2
VLT	0.627
PVLT	0.513
WAT	0.521
VLT & PVLT	0.696
PVLT & WAT	0.616
WAT & VLT	0.669
VLT, PVLT & WAT	0.709

On the whole, each independent variable, whether employed individually or in combination, turned out to be a fairly strong predictor for reading comprehension. The VLT accounted for 62.7% of the variance in the RCT, which is the strongest among the individual variables. The WAT and the PVLT predicted 52.1% and 51.3% of the RCT variance, respectively. These results indicate that vocabulary depth as well as vocabulary size considerably contributes to the prediction of reading comprehension.

In addition, combinations of each measure (VLT & PVLT, PVLT & WAT, WAT & VLT and VLT, PVLT & WAT) showed high predictability. The combination of the VLT and the PVLT predicted 69.6% of the variance in the RCT and the combination of the WAT and the VLT accounted for 66.9% of the

RCT variance. The combination of the PVLT and the WAT displayed the lowest predictability of 61.6% among the combinations of two measures, but this still provides a strong contribution to the prediction of the RCT. The combination of the VLT, the PVLT and the WAT showed the highest predictability of 70.9%. In other words, combining variables offered greater predictive power than individual variables alone. This suggests that combinations of different aspects of vocabulary knowledge contribute more to explaining reading comprehension than one aspect alone. In other words, learnersô multiple dimensions of vocabulary knowledge, rather than one dimension alone, provide a greater contribution to predicting their reading comprehension performances.

To summarize, both L2 vocabulary breadth and depth play an important role in predicting L2 reading comprehension. In addition, productive vocabulary knowledge as well as receptive vocabulary knowledge significantly contributes to reading comprehension. The findings from this study suggest that encompassing various dimensions of L2 vocabulary knowledge is essential for L2 vocabulary and reading instruction.

4.3.3. Analyses According to Reading Proficiency Levels

In order to determine whether the roles of vocabulary knowledge in reading comprehension vary according to the learners' reading proficiency, the participants were divided into two groups based on their RCT scores. The criteria for classification is whether the percentage of correct answers is above or below

80%. The RCT employed in this study contains 15 items. Therefore, those who scored above 80% (12 points) were placed in a high-level group and those who scored below 80% were categorized in a low-level group. As a result, 108 students were classified as the high-level group and 35 students as the low-level group.

An independent samples t-test was employed to check if the difference between the high- and low-level groups was statistically significant. The result presented in Table 4.13 proves that the two groups were statistically different.

TABLE 4.13

Independent Samples t-test of the RCT

	t	*df*	*Sig.*
High- and Low-level Groups	15.904	39.707	.000

Table 4.14 shows the descriptive statistics for the RCT, the VLT, the PVLT and the WAT of high- and low-level groups, respectively. The mean scores of the RCT are 14.06 out of 15 for the high-level group and 8.26 for the low-level group. The percentages of correct answers on the RCT are 93.7% for the high-level group and 55.1% for the low-level group.

TABLE 4.14

Descriptive Analysis According to Reading Proficiency Levels

		RCT	VLT	PVLT	WAT
High-level Group (N=108)	Mean	14.06	28.02	13.34	90.12
	SD	1.044	2.238	3.230	8.676
	Correct Answers (%)	93.7%	93.4%	74.1%	75.1%
Low-level Group (N=35)	Mean	8.26	20.71	8.06	66.60
	SD	2.077	6.420	2.754	16.811
	Correct Answers (%)	55.1%	69.0%	44.8%	55.5%

Regression analyses were conducted to investigate whether the contributions of the variables to the RCT prediction could vary across the reading proficiency groups. Table 4.15 summarizes the results from regression analyses for the two proficiency groups.

TABLE 4.15

R-Square of the Correlation Coefficient

between Each Predictor Variable and the RCT for Reading Proficiency Groups

Model	R^2 of the High-level Group	R^2 of the Low-level Group
VLT	0.379	0.386
PVLT	0.245	0.436
WAT	0.160	0.120

In general, each variable offered some contribution to the prediction of the RCT within the two groups. The VLT predicted 37.9% and 38.6% of the RCT variance for the high- and low-level groups, respectively. For the high-level group, the VLT was the strongest predictor for the RCT. For the low-level group, the PVLT accounted for 43.6% of the variance in the RCT, which is the strongest among the variables. The WAT showed the lowest predictability within both groups with 16.0% for the high-level group and 12.0% for the low-level group.

On the whole, the results show that the participants' vocabulary size and depth served as a predictor for reading comprehension to some extent for both the high- and low-level groups. There are two things to be considered here. First, the low predictability of the WAT to the RCT for both groups indicates that students' knowledge of vocabulary depth is quite low irrespective of their reading proficiency. One of the possible reasons for this may be that the test format of the WAT was quite unfamiliar to the students as mentioned before. Moreover, although students do not have in-depth understanding about words, they can guess the meanings from the context and comprehend the reading passages.

Second, the lower predictability of the PVLT to the RCT for the high-level group than the low-level group may imply that students are not familiar with using their vocabulary knowledge productively, although their reading performance is fairly good. In an EFL setting, students are more likely to be exposed to listening and reading than to speaking and writing. Therefore, even a student with high listening and reading abilities may not possess correspondingly high speaking and writing abilities which require him to use his vocabulary knowledge productively.

CHAPTER 5.
CONCLUSION

This chapter concludes the present study. Section 5.1 summarizes the major findings of this study and Section 5.2 discusses pedagogical implications drawn from the findings for teachers and researchers in the instruction and assessment of L2 vocabulary. Finally, Section 5.3 provides some limitations of the current study and suggestions for further research.

5.1. Summary of the Findings

This study focused on the three dimensions of vocabulary knowledge, namely, receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge. The purpose of this study was to investigate (a) the relationships among the three dimensions of vocabulary knowledge according to the students' vocabulary proficiency among Korean EFL high school students, and (b) the extent to which the three dimensions of vocabulary knowledge contribute to their reading comprehension according to their reading proficiency.

143 Korean high school students in the 10th grade participated in this study. To assess the participants' vocabulary knowledge and reading comprehension performance, the Vocabulary Levels Test (VLT), the Productive Vocabulary

Levels Test (PVLT), the Word Associates Test (WAT), and the Reading Comprehension Test (RCT) were employed.

In order to resolve the research questions, correlation and regression analyses were carried out. With regard to the first research question, the three dimensions of vocabulary knowledge had strong relationships with one another for the participants as a whole. Among the three vocabulary tests, the correlation and predictability between the VLT and the WAT were the highest, suggesting that vocabulary breadth and depth might be accounted for by the same factors to a large extent. When the students were divided into two groups based on their VLT scores, the degree of correlations showed several differences depending on the vocabulary proficiency. For the high-level group students, the correlation of the PVLT with the WAT was the highest among the variables, indicating that both productive vocabulary knowledge and depth of vocabulary knowledge develop as receptive vocabulary knowledge increases. For the low-level group students, however, the correlation of the PVLT with the WAT was the lowest among the variables. Furthermore, the correlation of the VLT with the PVLT for the low-level group was weak in comparison to the high-level group, which implies that productive vocabulary knowledge and vocabulary depth can improve when a student has basic knowledge of receptive vocabulary at a certain level.

In regard to the second research question, the results showed that the three dimensions of vocabulary knowledge were significantly related to reading comprehension and that vocabulary depth as well as vocabulary size provided strong contribution to the prediction of the whole students' reading

comprehension performance. In addition, when combining each measure (VLT & PVLT, PVLT & WAT, WAT & VLT, and VLT, PVLT & WAT), the predictability increased, compared with the individual measure alone. This suggests that combinations of different dimensions of vocabulary knowledge, rather than one dimension alone, offer an additional explanation for reading comprehension. When the students were divided into two groups based on their RCT scores, the extent of contributions differed according to their reading proficiency. The PVLT showed a lower predictive power on reading performance for the high-level group than the low-level group. This may imply that even a student with high reading comprehension skills is not familiar with using his vocabulary knowledge productively. In addition, the WAT turned out to have the lowest predictability on reading performance for both the high- and low-level groups, indicating that students' knowledge of vocabulary depth is quite low irrespective of their reading proficiency.

To sum up, the present study reveals that different dimensions of vocabulary knowledge, which are receptive vocabulary knowledge, productive vocabulary knowledge and depth of vocabulary knowledge, have strong correlations with one another, and that both vocabulary breadth and depth play a very important role in predicting reading comprehension. Therefore, it is suggested that attention needs to be paid to various aspects of vocabulary knowledge in the field of vocabulary learning. As a result of this effort, studentsô reading comprehension will be further developed as well.

5.2. Pedagogical Implications

The findings of the study suggest that there exist high and positive correlations among the three dimensions of vocabulary knowledge, and that vocabulary depth as well as vocabulary size significantly contributes to the prediction of reading comprehension performance. In other words, L2 learners with both a great amount of vocabulary and a deep knowledge of words have more advantages of L2 reading. Several implications can be drawn from these suggestions for teachers and researchers in the field of ESL/EFL vocabulary and reading.

First, L2 vocabulary instruction needs to recognize the complex nature of vocabulary knowledge and to devote more attention to its multiple dimensions. Language educators and curriculum designers have generally focused much more on increasing learners' vocabulary size, based on the concept that the larger the number of words known, the deeper the knowledge of the words (Vermeer, 2001). Consequently, learners mainly pay attention to expanding their vocabulary knowledge by memorizing the simple meaning of words. However, a large vocabulary size does not necessarily result in the deep knowledge of vocabulary. Moreover, if too many words are given to learners at one time, they cannot recall their meanings later (Beck, McKeown, & Kucan, 2002). The fact that students with wider and deeper lexical knowledge show better performance on reading comprehension throws an important topic to the vocabulary instruction. Since providing only the basic meaning of a word may prohibit learners from

understanding various aspects of words, vocabulary instruction needs to deal with multiple meanings, as well as semantic, phonological, morphological, syntactical and collocational aspects. In other words, vocabulary knowledge should be considered as comprising various dimensions rather than being a single construct in vocabulary instruction.

Second, vocabulary assessments need to combine both vocabulary size and depth tests. Vocabulary tests have commonly focused on measuring receptive vocabulary size rather than productive vocabulary size and the depth of vocabulary knowledge, due to the difficulty of developing and implementing valid and reliable measurement instruments for the production and depth dimensions. The present study, however, showed the significantly combined effects of receptive vocabulary knowledge, productive vocabulary knowledge and vocabulary depth on reading comprehension. The Productive Vocabulary Levels Test and the Word Associates Test were implemented in this study to measure productive vocabulary knowledge and vocabulary depth respectively. The PVLT asks the test-taker to fill in a word where the first letters are given, while the WAT requires the paradigmatic and syntagmatic relationships of a word. These measurements can provide more meaningful information about the learners' lexical knowledge than a measurement of receptive vocabulary size alone. Therefore, productive vocabulary knowledge and vocabulary depth, as well as receptive vocabulary knowledge, should be contained in vocabulary tests in order to understand the multidimensional vocabulary knowledge. Furthermore, it is suggested that a combined test which assesses various aspects of a word at one time should be devised.

5.3. Limitations and Suggestions for Further Research

There are several limitations to the present research. First, this study evaluated vocabulary knowledge and reading comprehension of only 143 high school students. The small sample size might make it difficult to apply the findings of this study to Korean EFL high school students in general. Further research is recommended to work with a sufficient number of participants, including students of different ages in different regions, so that the results of the study can be generalized to all high school students in Korea. Moreover, in order to see the differences according to the proficiency levels, students were divided according to only two proficiency levels in this study. If participants are classified into more diverse proficiency groups, different results could be revealed in the relationship between vocabulary knowledge and reading comprehension.

Second, the Vocabulary Levels Test and the Productive Vocabulary Levels Test as measures of vocabulary size were limited to only 2000-word level in this study, taking into consideration the vocabulary size expected for the students to reach according to the National Curriculum. For a more comprehensive study of receptive and productive vocabulary knowledge, however, employing other low-frequency word levels or all levels would provide more meaningful information about studentsô vocabulary size.

Third, the number of items on the Reading Comprehension Test was also limited. Since the students were fairly familiar with the test format, more test items

could have been implemented in the same limited time. Therefore, future studies need to contain a large number of items with different types of questions and texts on the reading comprehension test. In addition, other variables such as L1 reading skills, background knowledge of the subject matter, grammatical knowledge and syntactic skills were excluded in assessing reading comprehension other than lexical knowledge. These variables, as well as vocabulary knowledge, may have an effect on reading performance.

Finally, future studies in the instructional effects of vocabulary knowledge can better investigate how various dimensions of vocabulary knowledge will develop over time and to what extent the instruction will have an effect on vocabulary knowledge. Particularly, longitudinal studies involving productive vocabulary knowledge and depth of vocabulary knowledge should be conducted in order to confirm the findings of this study.

In spite of these limitations, the findings from the present study offer valuable information about the relationship between various dimensions of vocabulary knowledge and their roles in reading comprehension.

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APPENDICES

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APPENDIX 1. Vocabulary Levels Test

영어 단어 평가 I

(　　)학년 (　　)반 (　　)번 이름 (　　)

※ 각 문제에서 왼쪽에는 여섯 개의 단어가 주어지고, 오른쪽에는 세 개의 설명이 주어집니다. 오른쪽에 주어진 설명에 해당되는 단어를 왼쪽에서 찾아 그 번호를 쓰십시오.

〈 예 시 〉

1 business		
2 clock	6	part of a house
3 horse	3	animal with four legs
4 pencil	4	something used for writing
5 shoe		
6 wall		

※ 주의: 주어진 설명이 가리키는 단어를 모르는 경우, 추측하거나 찍지 말고 빈칸으로 남겨두면 됩니다. 단어의 의미를 아는 경우에만 답을 표시하시기 바랍니다.

(1)

1 copy		
2 event	_____	end or highest point
3 motor	_____	this moves a car
4 pity	_____	thing made to be like another
5 profit		
6 tip		

(2)

1 accident		
2 debt	_____	loud deep sound
3 fortune	_____	something you must pay
4 pride	_____	having a high opinion of yourself
5 roar		
6 thread		

(3)

1 coffee		
2 disease	_____	money for work
3 justice	_____	a piece of clothing
4 skirt	_____	using the law in the right way
5 stage		
6 wage		

(4)

1 arrange		
2 develop	_____	grow
3 lean	_____	put in order
4 owe	_____	like more than something else
5 prefer		
6 seize		

- 1 -

영어 단어 평가 I

(5) 1 clerk
2 frame _____ a drink
3 noise _____ office worker
4 respect _____ unwanted sound
5 theater
6 wine

(6) 1 blame
2 elect _____ make
3 jump _____ choose by voting
4 manufacture _____ become like water
5 melt
6 threaten

(7) 1 dozen
2 empire _____ chance
3 opportunity _____ twelve
4 tax _____ money paid to the government
5 relief
6 gift

(8) 1 ancient
2 curious _____ not easy
3 difficult _____ very old
4 entire _____ related to God
5 holy
6 social

(9) 1 admire
2 complain _____ make wider or longer
3 fix _____ bring in for the first time
4 hire _____ have a high opinion of someone
5 introduce
6 stretch

(10) 1 bitter
2 independent _____ beautiful
3 lovely _____ small
4 merry _____ liked by many people
5 popular
6 slight

APPENDIX 2. Word Associates Test

영어 단어 평가 Ⅱ

(　　)학년 (　　)반 (　　)번 이름 (　　)

※ 상자 안의 8개 단어 중에서 주어진 단어와 관련이 있는 단어를 4개 고릅니다.
왼쪽 상자에서는 제시된 단어의 뜻을 나타내는 단어나 제시된 단어의 동의어를 고릅니다.
오른쪽 상자에서는 주어진 단어와 자주 함께 쓰이는 단어를 고릅니다.
양쪽 상자를 합해 총 4개의 단어에 V 표시를 합니다.

< 예 시 >

sudden

☐beautiful ☑quick ☑surprising ☐thirsty	☑change ☐doctor ☑noise ☐school

< 해 설 >

왼쪽 상자	오른쪽 상자
"sudden"은 "갑작스러운, 예기치 못한"이라는 뜻입니다. 따라서 정답은 "sudden"이 가진 뜻을 나타내는 "quick(빠른)"과 "surprising(놀라운)"입니다.	보통 "sudden doctor"나 "sudden school"이라는 표현은 쓰이지 않고, "sudden change"와 "sudden noise"라는 표현은 자주 쓰입니다. 따라서 정답은 "sudden"과 흔히 함께 쓰이는 "change"와 "noise"입니다.

※ 주의: 모든 문제가 왼쪽 상자에서 2개, 오른쪽 상자에서 2개를 골라야하는 것은 아닙니다.
왼쪽과 오른쪽을 합해서 4개를 고르는 것입니다. 단, 어느 한쪽이 0개고, 다른 한쪽이 4개인 경우는 없습니다.
즉, 한쪽 상자에서 반드시 1개는 관련된 단어가 있습니다. 다음과 같이 3가지 가능한 경우의 수가 있습니다.

< 가능한 경우의 수 >

1. 왼쪽 1개 : 오른쪽 3개

☐ ☐ ☐ ☑	☐ ☑ ☑ ☑

2. 왼쪽 2개 : 오른쪽 2개

☐ ☐ ☑ ☑	☐ ☑ ☑ ☐

3. 왼쪽 3개 : 오른쪽 1개

☐ ☑ ☑ ☑	☐ ☑ ☐ ☐

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영어 단어 평가 Ⅱ

1. beautiful

☐ enjoyable ☐ expensive ☐ free ☐ loud	☐ education ☐ face ☐ music ☐ weather

2. bright

☐ clever ☐ famous ☐ happy ☐ shining	☐ color ☐ hand ☐ poem ☐ taste

3. calm

☐ open ☐ quiet ☐ smooth ☐ tired	☐ cloth ☐ day ☐ light ☐ person

4. natural

☐ expected ☐ helpful ☐ real ☐ short	☐ foods ☐ neighbors ☐ parents ☐ songs

5. fresh

☐ another ☐ cool ☐ easy ☐ raw	☐ cotton ☐ heat ☐ language ☐ water

6. general

☐ closed ☐ different ☐ usual ☐ whole	☐ country ☐ idea ☐ reader ☐ street

7. bare

☐ empty ☐ heavy ☐ uncovered ☐ useful	☐ cupboard ☐ feet ☐ school ☐ tool

8. acute

☐ hidden ☐ often ☐ rich ☐ sharp	☐ angle ☐ hearing ☐ illness ☐ stones

9. common

☐ complete ☐ ordinary ☐ light ☐ shared	☐ boundary ☐ circle ☐ name ☐ party

10. complex

☐ angry ☐ difficult ☐ necessary ☐ sudden	☐ argument ☐ passengers ☐ patterns ☐ problem

영어 단어 평가 Ⅱ

11. broad

☐ full ☐ moving ☐ quiet ☐ wide	☐ night ☐ river ☐ shoulders ☐ smile

12. conscious

☐ awake ☐ healthy ☐ knowing ☐ laughing	☐ face ☐ decision ☐ effort ☐ student

13. convenient

☐ easy ☐ fresh ☐ near ☐ suitable	☐ experience ☐ sound ☐ time ☐ vegetable

14. dense

☐ crowded ☐ hot ☐ noisy ☐ thick	☐ forest ☐ handle ☐ smoke ☐ weather

15. curious

☐ helpful ☐ interested ☐ missing ☐ strange	☐ accident ☐ child ☐ computer ☐ steel

16. distinct

☐ clear ☐ famous ☐ separate ☐ true	☐ advantage ☐ meanings ☐ news ☐ parents

17. dull

☐ cloudy ☐ loud ☐ nice ☐ secret	☐ color ☐ knife ☐ place ☐ rock

18. direct

☐ honest ☐ main ☐ straight ☐ wide	☐ fence ☐ flight ☐ heat ☐ river

19. favorable

☐ helpful ☐ legal ☐ possible ☐ positive	☐ habit ☐ response ☐ teacher ☐ weather

20. tight

☐ close ☐ rough ☐ uncomfortable ☐ wet	☐ bend ☐ pants ☐ surface ☐ wood

영어 단어 평가 Ⅱ

21. violent

☐ expected ☐ smelly ☐ strong ☐ unlucky	☐ anger ☐ death ☐ rubbish ☐ storm

22. compact

☐ effective ☐ small ☐ solid ☐ useful	☐ group ☐ kitchen ☐ medicine ☐ string

23. domestic

☐ home ☐ national ☐ regular ☐ smooth	☐ animal ☐ movement ☐ policy ☐ speed

24. profound

☐ bright ☐ deep ☐ exact ☐ great	☐ effect ☐ machine ☐ taste ☐ thought

25. formal

☐ fast ☐ organised ☐ loud ☐ serious	☐ bomb ☐ education ☐ growth ☐ statement

26. independent

☐ changed ☐ equal ☐ important ☐ separate	☐ child ☐ country ☐ ideas ☐ prices

27. original

☐ careful ☐ closed ☐ first ☐ proud	☐ condition ☐ mind ☐ plan ☐ sister

28. professional

☐ paid ☐ public ☐ regular ☐ religious	☐ advice ☐ manner ☐ musician ☐ transport

29. critical

☐ clear ☐ dangerous ☐ important ☐ rough	☐ festival ☐ illness ☐ time ☐ water

30. dramatic

☐ exciting ☐ official ☐ surprising ☐ worried	☐ adventure ☐ change ☐ patient ☐ salary

APPENDIX 3. Productive Vocabulary Levels Test

영어 단어 평가 Ⅲ

(　　)학년 (　　)반 (　　)번 이름 (　　)

※ 빈칸을 완성하여 완전한 문장이 되도록 합니다.

< 예 시 >

He was riding a bicycle.

1. I'm glad we had this opp_____ to talk.
2. There are a doz_____ eggs in the basket.
3. Every working person must pay income t_____.
4. The pirates buried the trea_____ on a desert island.
5. Her beauty and cha_____ had a powerful effect on men.
6. La_____ of rain led to a shortage of water in the city.
7. He takes cr_____ and sugar in his coffee.
8. The rich man died and left all his we_____ to his son.
9. Pup_____ must hand in their papers by the end of the week.
10. This sweater is too tight. It needs to be stret_____.
11. Ann intro_____ her boyfriend to her mother.
12. Teenagers often adm_____ and worship pop singers.
13. If you blow up that balloon any more it will bur_____.
14. In order to be accepted into the university, he had to impr_____ his grades.
15. The telegram was deli_____ two hours after it had been sent.
16. The differences were so sl_____ that they went unnoticed.
17. The dress you're wearing is lov_____.
18. He wasn't very popu_____ when he was a teenager, but he has many friends now.

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APPENDIX 4. Reading Comprehension Test

영어 읽기 평가

( )학년 ( )반 ( )번 이름 ( )

1. They[they]가 가리키는 대상이 나머지 넷과 다른 것은?

A few years ago, while setting up camp deep in the rain forest, Morgan and Sanz heard a party of chimpanzees vocalizing loudly in the distance. ① They thought the chimpanzees were moving rapidly among trees. The chimpanzees were yelling louder and ② they seemed to be heading straight for the camp. Morgan and Sanz felt the chimpanzees would soon be nearly on top of the tents. Then, just as ③ they heard the chimpanzees closing their distance to a few dozen yards, suddenly the forest went silent. ④ They looked up and saw the chimpanzees peering down. It was such a frightening moment that Morgan and Sanz ran away as if ⑤ they saw ghosts.

2. 다음 글의 목적으로 가장 적절한 것은?

In each of the fairy tales, there's a happily-ever-after. But what happens when you get everything you've always wanted and still aren't happy? This is the question posed by the award-winning musical, *Into the Woods*, which will be presented by the Marquette High School drama club in November. This musical looks at the nature of love and parental relationships. It is also full of humor and fantastic music. It will be performed at Kaufman Auditorium on November 15th. You will be impressed by the performance of fantastic high school students.

① 뮤지컬 공연을 안내하려고
② 작품의 수상 이유를 설명하려고
③ 뮤지컬 배우 오디션을 홍보하려고
④ 공연에 출연한 배우들을 칭찬하려고
⑤ 올바른 공연 관람 태도를 알려주려고

3. 다음 글에서 전체 흐름과 관계 없는 문장은?

Your mouth is the first stage of the digestive process. ① When you take a bite and begin to chew your food, it becomes smaller, softer, and easier to swallow. ② Your lips close to stop food falling from your mouth and your teeth crunch your food into smaller pieces. ③ As your food moves around, it becomes coated in saliva, which helps to break down some ingredients of food into smaller pieces. ④ Nutrients from the digested food in the stomach can be absorbed directly into the blood. ⑤ Food becomes smaller in your mouth, which is helpful for the next step of the digestive process.

*saliva: 침, 타액

4. 다음 글에서 필자가 주장하는 바로 가장 적절한 것은?

It was upsetting to hear of your plan to freeze Social Security benefits at their present level. When your administration announced the plan to increase the benefits last year, we, senior citizens, believed your promise. I can't understand the sudden change of your plan. I think the increases are quite reasonable because my generation worked hard and paid taxes. We also faithfully funded the Social Security system during our working years. I urge you to follow your original plan from last year.

① 노년층의 사회참여 기회를 확대하라.
② 노년층을 위한 복지 시설을 확충하라.
③ 사회보장수혜금 지급 절차를 간소화하라.
④ 세금 체납자에 대한 법적 규제를 강화하라.
⑤ 사회보장수혜금의 인상을 계획대로 추진하라.

- 1 -

5. 다음 글의 빈칸에 들어갈 말로 가장 적절한 것은?

Exercise and diet are important, but they are not the only keys to longevity. Meditating might also be important. Planting a garden or playing games with friends might be calming and relaxing. If those things bring you pleasure or make you laugh, then do them. Longevity is a two-sided coin, with quantity on one side and quality on the other. Just as no one wants a great life that's cut short early, no one wants a life that's long but not satisfying. We want to have it both ways: _____.

① short and rich
② long and happy
③ fast and wealthy
④ famous and powerful
⑤ challenging and healthy

6. 다음 글의 주제로 가장 적절한 것은?

Experts say that you only need 20 to 30 minutes of modest physical activity three times a week to shape up your body. You can do it easily and you don't need to go to the gym. Climbing the stairs instead of riding the escalator counts. Briskly walking 10 minutes around the neighborhood, three times a day, satisfies your daily exercise requirement. Anything you do with pleasure that works up even a light sweat is exercise. Remember, if an activity is easy to perform, easy to fit into your schedule, and easy to love, you're more likely to stick with it.

① the difficulty of keeping in shape
② effects of exercise on schoolwork
③ the need for the effective exercise plan
④ easy ways to do exercise in our daily lives
⑤ tips for working out without hurting oneself

7. Uppsala에 대한 다음 글의 내용과 일치하는 것은?

Uppsala is the fourth largest city of Sweden. Lying 70 km north of the capital city of Stockholm, this city has a population of less than 150,000. The transportation system for the travelers is developed quite well. Those who have the taste for ancient architecture can visit the Uppsala castle, which has an array of old paintings. Uppsala is the birthplace of Ingmar Bergman, a famous director, who used this beautiful city as a film setting. This attractive city invites you to participate in the Uppsala Reggae Festival happening every year in the month of March. Uppsala also gives you an adventurous experience with its chilly climate and rugged landscape.

① 스톡홀름 남쪽 70km 지점에 위치해 있다.
② 관광객을 위한 교통 체계가 미비하다.
③ 현대 미술 작품이 전시되어 있는 성이 있다.
④ 유명한 영화감독이 태어난 곳이다.
⑤ Reggae 축제가 3년에 한 번씩 열린다.

8. strawberry poison arrow frog에 대한 다음 글의 내용과 일치하지 않는 것은?

The strawberry poison arrow frog is found in the rain forests of Central America. It has bright red coloring that warns predators that it is toxic. Frogs are not usually known for their parenting skills, but strawberry poison arrow frog mothers go to great lengths for their offspring. Once her tadpoles hatch on the forest floor, the mother carries her offspring one by one into the treetops. Her trips often take her 100 feet off the ground. She places each tadpole into a pool of rain water that gathers in a leaf. The mother returns to each pool every few days to bring food. After three weeks, the tadpoles develop into tiny frogs and leave the water for land.

① 중앙아메리카의 우림 지역에서 발견된다.
② 포식자에게 독성이 있음을 경고하는 붉은색을 띤다.
③ 얕은 강물 속에서 부화하여 올챙이가 된다.
④ 어미는 올챙이를 나뭇잎에 고인 빗물에 둔다.
⑤ 올챙이가 개구리로 성장하기까지 3주 걸린다.

[9 ~ 10] 다음 글의 제목으로 가장 적절한 것을 고르시오.

9. Have you ever noticed how a coin at the bottom of a swimming pool seems to tremble? This occurs because the water in the pool bends the path of light reflected from the coin. Similarly, stars twinkle because their light has to pass through several miles of Earth's atmosphere before it reaches the eye of an observer. It is as if we are looking at the universe from the bottom of a swimming pool. Our atmosphere is violent all the time. This disturbance acts like lenses and prisms that shift a star's light from side to side by tiny amounts several times a second.

① Origin of Stars: Big Bang
② Why Stars Twinkle in the Sky
③ How to Observe Stars at Night
④ Measuring the Intensity of Light
⑤ Clear Sky: Lenses for Observation

10. For half a century, from Picasso's arrival in Paris in 1904 to Henri Matisse's death in 1954, the two artists were not only rivals for the leadership of the international avant-garde but also each other's greatest critic and fan. They could foster creativity through rivalry. Throughout history, there are many other talented contemporaries — Verdi and Wagner, Tolstoy and Dostoevsky, Gauguin and Van Gogh — who tested and taught one another, pushing each other to experiment in ways they might never have dared. Even if they were different in many aspects, the competition through rivalry inspired greater innovation.

*avant-garde: 전위파, 아방가르드

① Historic Figures Overcoming Their Hardships
② Artistic Creativity: Requirement for Great Painters
③ Great Rivals Who Positively Influenced Each Other
④ New Trends of Literary Criticism in the 20th Century
⑤ Frontiers of the International Avant-garde Movement

영어 읽기 평가

11. 다음 글의 요지로 가장 적절한 것은?

In almost every instance, the book as originally written is the best. Simplifying great writing means less-than-great writing. If you want to read Bambi, then read it as Felix Salten wrote it, not the child-friendly popular version. If you want to know Winnie-the-Pooh and his friends, it is best to meet them in Alan Alexander Milne's original story with Ernest Shepard's drawings. Most children are used to reading the classics published as the popular versions, which often bear little likeness to the original. It is not a good idea to buy weak editions. Try to find the versions written by the original authors.

① 원작자가 쓴 책을 읽는 것이 좋다.
② 삽화가 많은 책을 구입하는 것이 좋다.
③ 동화책은 아이들의 창의력 신장에 도움이 된다.
④ 동화는 현실 속의 다양한 삶의 모습을 담고 있다.
⑤ 영화로 제작된 동화는 더욱 재미있게 즐길 수 있다.

12. 다음 글의 (A), (B)에 들어갈 말을 바르게 짝지은 것은?

In 1793, young Yale graduate Eli Whitney was journeying to a teaching job in South Carolina when he was invited to the plantation near Savannah. Whitney was disturbed by his glimpse of slavery and the backbreaking demands of cotton plantation life. He wanted to relieve some of the tiring work. __(A)__, he built a cotton gin, a simple machine that quickly and efficiently removed the seed from the cotton fiber. In one hour, his gin processed the same amount that required ten hours of slave labor. He submitted his patent, returned to Connecticut, and began taking orders. __(B)__, his innovative invention had a reverse effect. The gin required more slaves as cotton culture expanded.

	(A)		(B)
①	Therefore	·····	However
②	Therefore	·····	Likewise
③	Conversely	·····	However
④	For example	·····	Likewise
⑤	For example	·····	Moreover

13. 글의 흐름으로 보아, 주어진 문장이 들어가기에 가장 적절한 곳은?

> Other parents, however, insist that children do not learn a work ethic this way.

How should parents introduce their kids to pocket money? (①) Some parents link this with a set of chores to help their kids understand that money is something they earn. (②) A mother of a child says that linking jobs, such as laying the table and emptying the dishwasher, with pocket money is helpful. (③) She likes the fact that it makes her child familiar with the notion of working for money. (④) Rather, they feel that it makes children help parents not because they ought to but because they want something. (⑤) Whatever your decision, make clear why your children get pocket money and what it means.

영어 읽기 평가

14. 주어진 글 다음에 이어질 글을 순서대로 바르게 배열한 것은?

> After World War Ⅱ, the armies gathered up many hungry, homeless children and placed them in large camps.

(A) The slice of bread produced amazing results. The children would go to sleep, feeling they would have something to eat tomorrow. That assurance gave the children a calm and peaceful rest.

(B) In these camps the children were cared for and fed. However, at night they did not sleep well. They seemed restless and afraid. Finally, a psychologist found a solution.

(C) He gave each of them a slice of bread just before they went to bed. If they wanted more to eat, more was provided, but this particular slice was not to be eaten — they just held it.

① (A)−(C)−(B)　② (B)−(A)−(C)
③ (B)−(C)−(A)　④ (C)−(A)−(B)
⑤ (C)−(B)−(A)

15. 다음 글의 내용을 한 문장으로 요약하고자 한다. (A)와 (B)에 들어갈 말을 바르게 짝지은 것은?

> How do we know how a melody sounds when we are not hearing it? We send information about the melody from our memory to our auditory cortex. Then, we experience a mental sound. Because "Happy Birthday" is sung only on birthdays, it is not usually there when we want to listen to it. If our ears do not feed the auditory cortex the information about the song, we must get it from our memory. The information sent from memory will allow us to have a fake listen. Through this process, we are able to discover things about the song even when we are not hearing it.
>
> *auditory cortex: 청각 피질

⬇

> When we are not hearing a song with our ears, the information about the melody in our ___(A)___ is sent to auditory cortex and we listen to ___(B)___ sound.

	(A)		(B)
①	memory	·····	mental
②	sight	·····	mechanical
③	voice	·····	mental
④	memory	·····	mechanical
⑤	sight	·····	vocal

국 문 초 록

어휘 지식이 읽기 이해에 있어 중요한 역할을 한다는 것은 오랫동안 인식되어왔다. 어휘 지식은 양적 지식과 깊이 지식으로 구성되고, 수용적 측면과 산출적 측면을 포함하고 있다고 인정하고 있다. 그러나 대부분의 연구는 산출적 어휘 지식과 깊이 지식보다는 수용적 어휘 지식에만 편중되었다.

본 연구는 학생들의 어휘 능숙도에 따른 수용적 어휘 지식, 산출적 어휘 지식, 그리고 어휘 지식의 깊이 사이의 관계를 살펴보고자 한다. 또한 영어 읽기 이해에 있어서 학생들의 읽기 능숙도에 따른 세 가지 어휘 지식의 역할에 대해 알아보고자 한다.

본 연구에서 경기도 소재의 고등학교에 재학중인 143명의 10학년생을 대상으로 네 가지 주요 평가 ï Vocabulary Levels Test (VLT), Productive Vocabulary Levels Test (PVLT), Word Associates Test (WAT), 그리고 Reading Comprehension Test (RCT)를 실시하였다. 각 평가의 채점 결과는 상관관계 분석과 회귀 분석을 통해 이루어졌다.

그 결과 세 가지 어휘 지식은 서로 높은 상관관계를 보였다. 수용적 어휘 지식을 어휘 지식의 가장 기본적인 지식이라는 가정 하에 VLT 점수를 바탕으로 학생들을 두 집단으로 나누었을 때, PVLT와 WAT의 상관관계가 상위 집단에서는 가장 높은 반면, 하위 집단에서는 가장 낮게 나타났다. 이는 산출적 어휘 지식과 깊이 지식은 수용적 어휘 지식이 어느 정도 발달했을 때 함께 발달할 수 있음을 보여준다.

또한 세 가지 어휘 지식 모두 읽기 이해의 상당 부분을 설명할 수 있는 것으로 밝혀졌다. RCT 점수를 바탕으로 학생들을 두 집단으로 나누었을 때,

상위 집단과 하위 집단 모두 어휘 깊이 측면이 읽기 이해를 예측할 수 있는 설명력이 가장 낮았는데, 이는 어휘 깊이 지식이 학생들의 읽기 능숙도에 상관없이 상당히 낮다는 것을 보여준다. 이와 더불어 산출적 어휘 지식이 하위 집단보다 상위 집단에서 읽기 이해에 대한 예측력이 낮았는데, 이는 높은 읽기 수행을 가진 학생이라도 산출적 어휘 지식은 미흡하다는 것을 보여준다.

본 연구는 제 2언어 어휘 지식과 읽기 이해에서의 그 역할에 대해 보다 구체적인 정보를 제공할 것으로 기대된다. 또한, 어휘 지식의 다양한 측면을 아는 것이 성공적인 읽기 이해에 공헌할 수 있으므로, 어휘 교수 및 평가 시 어휘의 양적 지식뿐만 아니라 어휘의 깊이 지식도 관심을 가질 것을 제안한다.

주요어: 영어 어휘 지식, 수용적 어휘 지식, 산출적 어휘 지식, 어휘의 깊이 지식, 영어 읽기 이해

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