The Contribution of English Vocabulary Knowledge to the Reading Comprehension in English among Nigerian Senior Secondary School Students

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Abstract

This paper examines the contributions of breadth and depth of English vocabulary knowledge to predicting the performance of senior secondary students in reading comprehension in English as a second language in Nigeria. The paper evaluates a test measuring three elements of depth dimension of English vocabulary knowledge, namely, synonymy, polysemy, and collocation. An English vocabulary size (breadth) measure and an ESL vocabulary item measure are also tested. The random sampling technique was used to select 300 participants from Senior Secondary 1 – 3 across ten secondary schools in Ilorin metropolis. Data were collected chiefly through tests administered on four language measures: Depth of English Vocabulary Knowledge (DEVK), English Vocabulary Size (EVS), ESL-Vocabulary Item Measure (ESL-VIM), and ESL-Reading for Basic Comprehension (ESL-RBC). A questionnaire was also used to obtain background information on the participants. Two-tailed Pearson product-moment correlations and multiple regression models were chosen as the dominant techniques for statistical analyses. SPSS (Statistical Package for Social Sciences) was used to conduct analyses on the data. Results indicate positive and significant correlation between scores on breadth and depth of English vocabulary knowledge and ESL-RBC, and that scores on the three vocabulary measures tested are similarly useful in predicting performance on the ESL-RBC measure used as the criterion. These findings thus provide empirical support for the centrality and importance of vocabulary factor in enhancing the performance of senior secondary ESL students in reading for basic comprehension in Nigeria.

Keywords: breadth, basic comprehension, collocation, correlation, depth, reading comprehension, vocabulary knowledge, English vocabulary size.

1.Introduction

The quest for a better reading comprehension in English is one of those beguiling challenges that continue to intrigue reading researchers and language scholars in many parts of the world. As measures to enhance or develop effective reading comprehension in the language, various investigations have been conducted into the question of whether there are identifiable subskills and knowledge sources within the overall ability to read for basic comprehension in English. And among the knowledge sources, one type of knowledge source that has been found to be strongly related to the learner's ability to read and understand texts in English, is vocabulary knowledge. In L1 research, the strong correlation between measures of breadth and depth of English vocabulary knowledge and reading comprehension is well established (Anderson & Freebody, 1981, 1983; Beck, Perfetti, & Mckeown, 1982; Mezynski, 1983; Stratton & Nacke, 1974 and Tuinman & Brady, 1974). However

although a few number of studies (for instance, Laufer, 1992, 1996, Liu & Nation, 1985, Hirsh & Nation, 1992 and Qian, 1998, 1999) have been conducted to explain the nature and strength of the correlation in L2, there has been comparatively little research on English vocabulary depth to investigate it thoroughly, and no empirical research has been conducted specifically among Nigerian senior secondary school students to demonstrate or establish this relationship. This paper therefore examines the contribution of English vocabulary knowledge to the reading comprehension in English among Nigerian Senior Secondary School Students.

What is Vocabulary Knowledge?

It has long been accepted that vocabulary knowledge is instrumental in reading comprehension (Anderson, 2000; Anderson & Freebody, 1981; Mezynski, 1983; Read, 2000). Over the years, lexical researchers in both first language (L1) and second language (L2) (Cronbach, 1942, Nation 1990, 2001, Qian, 1998, 1999, Mezynski, 1983, Henrikson, 1999 and Richards, 1976) have developed various criteria for understanding what is involved in knowing a word. An early definition (Cronbach, 1942) divided vocabulary knowledge into two main categories: knowledge of word meaning (generalization, breadth of meaning, and precision of meaning) and levels of accessibility to this knowledge (availability and application). The obvious weakness in this definition is the lack of a place for other aspects of lexical knowledge, such as spelling, pronounciation, morpho-syntactic properties, and collocation (Qian, 2002: 514). Later on, the move away from seeing vocabulary as lists of items to be learnt and towards the learner raises the question of precisely what it means to 'know' a word. Richards (1976:78) tries to tackle this issue, considering 'some of the knowledge that is assumed by lexical competence (1976:78). He brings the characterization of lexical knowledge down to eight broad assumptions:

1.   Native speakers continue to expand their vocabulary in adulthood. Little is known about the average language-user's vocabulary but anything from 20,000-100,000 words could be within a person's receptive vocabulary.
2.   Knowing a word means knowing the degree of probability of encountering it and the sorts of words most likely to be found associated with it (frequency and collocability).
3.   Knowing a word means knowing its limitations of use according to function and situation (temporal, social, geographical; field, mode, etc).
4.   Knowing a word means knowing its syntactic behavior (e.g. transitivity patterns, cases).
5.   Knowing a word means knowing its underlying forms and derivations.
6.   Knowing a word means knowing its place in a network of associations with other words in the language.
7.   Knowing a word means knowing its semantic value (its composition).
8.   Knowing a word means knowing its different meanings (polysemy). Richards then refers to published materials, which attempt to come to grips with these eight assumptions. These assumptions of lexical knowledge are more inclusive than Cronbach's (1942) framework, because Richards not only incorporated morphological and syntactic properties into the concept but also considered such aspects as word frequency and register characteristics. However, pronounciation, spelling and collocation seem to be some obvious missing aspects in the framework. Improving on his own earlier framework (Nation, 1990), Nation (2001) proposed a set of 18 questions classified into three categories, each containing receptive and productive aspects: (a) form, including spoken form, written form, and word parts; (b) meaning, including from and meaning, concept and reference, and associations; and (c) use, including grammatical functions, collocations, and constraints on use, such as register and frequency. Written from a practical perspective, this framework is particularly useful for classroom teachers.

Breadth versus Depth of English Vocabulary Knowledge

In research on vocabulary learning, a distinction has often been made between two dimension of English vocabulary knowledge: breadth, or size of knowledge and depth of knowledge (Haastrup & Henriksen, 2000: 2003; Meara, 1996, Qian, 1999, 2002 and Read, 2000). Breadth of vocabulary knowledge has been taken to refer to the quantity or number of words the meaning of which learners have at least some superficial or minimum knowledge at a particular level of language proficiency (nation, 2001, Qian, 1999, 2002). Researchers have used various types of assessment tools with different formats to measure this dimension of English vocabulary knowledge, including tests that require the learner to identify a synonym for a word in a multiple-choice test, match words with definitions, translate a word into L1, or use checklists (see Wesche & Paribakht, 1996, for a discussion of these various assessment types). One measure that has been widely used to assess size of vocabulary knowledge in the literature, for example, is Nation's (1990 and 1993) Vocabulary Levels Test, which has a word format and is composed of words representing different word frequency levels, ranging from high-frequency (2,0000-word level) to low-frequency words (10,000-word level).

Depth of Vocabulary Knowledge, on the other hand, has been used to refer to the quality of lexical knowledge, that is, 'a learner's level of knowledge of various aspects of a given word' (Qian, 1992: 282, Qian 2002:515) or 'how well the learner knows this word' (Meara, 1996 and Read, 1993, 2000). Haastrup & Henriksen (2000:222) define this dimension as mainly involving 'the knowledge of a word different sense relations to other words in the lexicon, for instance, paradigmatic (antomymy, synonymy, hyponymy, gradation) and syntagmatic (collocational restrictions). Researchers have noted the complexity and multidimensionality of word knowledge and have suggested that knowing a word well should mean more than knowing its individual meanings in particular contexts. Various kinds of knowledge are associated with a word that a learner must know for reading, especially from the perspective of their possible contributions to reading comprehension processes, ranging from knowledge related to its pronunciation, spelling, 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, syntactic properties and morphological features, semantic relationship with other words in the language, including denotative and collocational meanings; knowledge of antomymy, synonymy, hyponymy and polysemy, frequency of the word in the language, or whether is word is a commonly used word or one that appears only in some specialized texts (Qian, 1999, Chapelle, 1998, Henriksen, 1999, 2002 and Read, 2000).

Studies investigating the role of English vocabulary knowledge in reading have found that while measures of size (breadth) of vocabulary knowledge are strongly elated to the reader's understanding of texts (Laufer, 1997, Qian, 1998, 1999, 20002), measures examining aspects of depth of vocabulary knowledge make a stronger contribution to reading performance than those that simply measure a single definition of a word. Qian (1999, 2002), for example, found that depth of vocabulary knowledge, conceptualized as receptive knowledge of word meanings and collocations, was not only a better predictor of L2 reading comprehension but also made a unique contribution to L2 reading comprehension, over and above the contribution made by size (breadth) of vocabulary knowledge in English.

Breadth of English Vocabulary Knowledge Test

As mentioned earlier, a small number of studies in L2 research (Laufer, 1989, 1992 and 1996) have investigated the relationship between breadth (size) of English vocabulary and academic reading comprehension. Laufer (1996, 1997) found good correlations between the vocabulary tests and reading comprehension tests she used. In one study (Laufer, 1992) with 92 first-year university students whose native language was either Hebrew or Arabic, the correlation between the scores on the Vocabulary Levels Test (Nation, 1983) and reading comprehension was 50 (p < .0001), and that between the scores on a Eruocentres Vocabulary Test (Meara & Jones, 1989), which requires the testee to say 'yes'

or 'no' to indicate whether he or she knows the meaning of a target word, and on reading comprehension was 75 (p < .0001). In another study involving 80 first-year university students f similar L1 backgrounds in Israel (Laufer, 1996), a correlation of 71 (p < .0001) was reported between students' scores on reading comprehension and on Vocabulary Levels Test.

Koda's (1989) study of 24 college students learning Japanese as a foreign language found equally strong correlations between a self-made vocabulary test and two reading tests, one of them a fixed-ratio deletion cloze, an integrative procedure mainly tapping the testee's reading ability (Hale et al., 1988), and the other paragraph comprehension. The latter contained four passages with five short answer questions attached to each. Koda reported a correlation of 69 (p < .01) between their scores on the vocabulary test and their paragraph comprehension test scores.

In the behavioural sciences, a correlation of .50 is generally regarded as indicating a 'large correlational effect size' (Cohen, 1988:80), or at least a 'moderate positive relationship' (Hamilton, 1990:481) between any two variables considered, though this relation, Qian (1999:284) argued, is contingent on sample size and the distribution of variables. Following this general rule, the above reports appear to indicate that there probably indeed exists a strong association between the learner's breadth of vocabulary knowledge and their reading comprehension levels, and therefore that scores on English vocabulary size are capable of predicting performance on reading comprehension tasks.

Depth of English Vocabulary Knowledge Test

Depth of vocabulary knowledge is complex, and it is therefore very difficult to assess all the different components that constitute the full range of meanings and meaning relationships of a word (Qian 2002:517). For the same reason, most vocabulary tests in the literature deal with breadth of vocabulary knowledge. In recent years, however, there have been some attempts to develop measures to assess aspects of depth of English vocabulary knowledge (Greidanus & Nienhuis, 2001, Paribakht & Wesche 1993, Read, 1993, Qian 1999, 2002 and Eesche & Paribakht, 1996). For example, in a university ESL context, Paribakht & Wesche (1993) developed a test called Vocabulary Knowledge Scale (VKS), which was designed to measure the different levels of lexical knowledge of specific target words learners were learning in a comprehension-based ESL programme. The test involves a self-report format in which learners are presented with individual words and asked to indicate their degree of knowledge on a scale of 1 to 5, ranging from no familiarity with the target word to the ability to use it accurately in a sentence.

The VKS test has an easy format that can be used as a practical tool to measure the initial stages of word knowledge for certain words. However, as Wesche & Paribakht (1996:29) point out, the test was not designed to 'tap sophisticated knowledge of given words or describe the mental lexical networks to which the word belongs'. Thus, the measure does not assess the various meaning relationships a word has with other words, through these have been suggested to be an important aspect of depth of vocabulary knowledge (Read, 2000). One measure that attempts to capture these lexical meaning relationships, is the Word-Associate Test (WAT), developed by Read (1993). The WAT purports to measure the learner's depth of vocabulary knowledge through word associations, that is, the various semantic and collocational relationships that a word has closely correlated with L2 reading comprehension ability and has also been shown to have a high degree of internal reliability (Qian, 1999, 2002).

Relationship between Depth and Breadth of English Vocabulary Knowledge

Although to date few studies have been documented on the relationship between depth and breadth of vocabulary knowledge, support for a possible strong link between the two dimensions is found in two recent studies (Nurweni & Read, 2000 and Schmitt & Meara, 1997). Nurweni & Read, using a self-made translation-based vocabulary size te3st of 200 items and a depth of vocabulary knowledge test (Read, 1993), found a relatively high overall correlation (r – 62, n – 324) between the

scores on the two tests, although the sizes of correlation between the same two tests varied considerably when the sample was split into three proficiency level groups. The Schmitt & Meara's study on the English Vocabulary Knowledge of 88 Japanese young adult reports that, while the learner's knowledge of suffix and word association and their vocabulary sizes were interrelated with one another at various levels, the correlation between two elements examined, namely, word association and vocabulary size, were fairly high (62 for productive knowledge and 61 for receptive knowledge, $p < .05$).

It thus stands to reason that breadth and depth are two interconnected dimensions of vocabulary knowledge, the development of which are interdependent to a substantial extent. With the exception of students who are particularly knowledge in a certain domain as a result of experience or specialized training it would be rare for an L2 reader in the secondary school to have superior and in-depth knowledge of vocabulary in a given language in which his or her overall size of vocabulary was very limited. By the same token, a large vocabulary would probably not take a reader very far if his or her knowledge of this vocabulary was shallow or superficial. Therefore, while the issue of vocabulary size matters a great deal in predicting the relationship between English vocabulary knowledge and reading comprehension, the integral place of depth of English vocabulary knowledge in this relationship should also be accorded equal recognition.

The Role of English Vocabulary Knowledge in Reading Comprehension

As mentioned in the introduction, a number of L1 researchers have long noted the importance of both breadth and depth of English vocabulary knowledge in reading comprehension (Anderson & Freebody, 1981; Beck, Perfetti, & Kckeown, 1982 and Mezynski, 1983). The same, however, cannot be said of the situation in L2 research, where there has been little recognition of the role of depth of English vocabulary knowledge in reading comprehension, let alone empirical investigation on the topic. This is probably because the dimension of vocabulary depth is more difficult to measure than that of breadth and because, consequently, vocabulary size measures are relatively advanced in comparison with depth measure (Schmitt & McCarthy, 1997:323), although more recently, Qian (2002) investigated the relationship between the reading comprehension of academic English text of ESL learns enrolled in an intensive ESL programme and the breadth and depth of their vocabulary knowledge. Qian used the Depth of Vocabulary Knowledge (DVK) measure (the word associates format) proposed by Read (1993) to measure the depth of vocabulary knowledge. The study found that 'the dimension of vocabulary depth is as important as that of vocabulary size in predicting performance on academic reading', (Qian, 2002:513). These findings contribute to understanding the relationship between vocabulary knowledge and reading comprehension, especially in the context of reading assessment.

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**Vocabulary and Reading Comprehension in Senior
Secondary School English Language Syllabus**

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The West African Senior School Certificate Examinations Syllabus for the English Language is an integrated English studies syllabus embodying the following essential elements: vocabulary development, listening and reading comprehension, grammatical structures, spoken English, writing and literature. The idea is to promote a systematic development of both the language skills and the literary knowledge that are considered essential for effective use of English in oral and written (receptive and productive) communication as well as in learning other subjects in the school curriculum.

The various skills are broken down into their component subskills for purposes of systematic instruction, but the essential inter-dependence of vocabulary and reading comprehension skills taught through the various units is of interest to the present researcher and therefore has to be examined in the present review. One bold attempt in the syllabus is the deliberate integration of literature with the other component areas. Thus the importance of literature as a practical manifestation of proficiency in

the language is greatly enhanced by the way it is integrated with the other components and further employed to facilitate the understanding and manipulation of linguistic structure.

In the context of the Senior Secondary Certificate Examinations, the West African Examination Council (WAEC) (2004-2008) staked out the test domain for the reading comprehension measure as follows:

> The purpose of the reading comprehension test is to
> measure the candidate's ability to find appropriate equivalents
> for selected words and phrases, understand the factual content;
> make inferences from the content of the passages, respond to
> uses of English expressions to reveal/reflect sentiments/emotions/
> attitudes, identify and label basic grammatical structures, words,
> phrases, or clauses and explain their functions as they appear in the
> context; identify and explain basic literary terms and expressions;
> recast phrases or sentences into grammatical alternatives
> (WAEC, 2004-2008:192-3).

In line with this purpose, the reading comprehension component of the test is intended to reflect "a wide variety of sources all of which will be suitable for this level of examination in terms of theme, interest and experience of candidates" (WAEC, 2004-2008:193). The inclusion, in the syllabus, of excerpts from narratives dialogues and expositions of social, cultural, economic and political issues in any part of the world is clearly useful in categorizing reading tasks occurring among senior secondary school students, which serve as the source of various texts for the SSCE reading comprehension component.

In the vocabulary development component, the syllabus sees the teaching of vocabulary as a very major area for the achievement of a satisfactory level of competence in English language. The vocabulary component has therefore been designed so as to ensure that at the end of the 3 year' period, students are exposed to an adequate range of English vocabulary and current word usage that can enable them express as well as receive satisfactorily a wide range of ideas and experiences. Infact, vocabulary factory is considered a fundamental aspect in designing the SSS English language syllabus. The importance of this factor is reflected in the vocabulary component of the syllabus as follows:

> The test of lexis will be so designed so as to explore, not merely
> the extent of the candidates' vocabulary but more importantly in
> the use of lexical items, e.g. synonyms, antonyms and homonyms
> (WAEC, 2004-2008:194).

Consequently, the WAEC vocabulary framework identifies 6 aspects of word knowledge as relevant vocabulary variables to be taught to students to enhance a super performance in both receptive (listening and reading) and productive (speaking and writing) communication skills, meaning relations (e.g. synonyms, antonyms, hyponyms), collocability, register and functional constraints (e.g. idioms and figurative expressions), syntactic behavior, and association with other words in domains of knowledge and use (WAEC, 2004-2008:193:4). WAEC anticipated, it appears, that vocabulary would play a large role in determining reading tasks and test item difficulty. These vocabulary factors considerably overlap the dimensions of vocabulary size and depth proposed by Nation (1990, 2000). Chapelle (1988), Henriksen (1999) and Qian (1998, 1999). The common vocabulary elements identified in both the vocabulary framework of the SSCE English language syllabus and the vocabulary knowledge framework for the present study suggest that it is feasible to incorporate the proposed concept of vocabulary knowledge into the Senior Secondary School ESL reading comprehension research, which may lead to an improved conceptualization of the SSCE reading construct and may eventually contribute to developing new item types for SSCE reading comprehension tasks.

The Present Study

In the context of Nigerian Senior Secondary School Students, the present study aimed to determine the contribution of English vocabulary knowledge to basic reading comprehension in English as a global language. Specifically, the study aimed to examine the contribution of English vocabulary size and some factors of English vocabulary depth (synomymy, polysemy, and collocation) to predicting performance on reading for basic comprehension. It must be pointed out that although all vocabulary dimensions are conceptually relevant in measuring the contribution of English vocabulary knowledge in reading comprehension, only vocabulary size and a partial dimension of depth were evaluated in this study because these two dimensions appeared to be central in the framework.

The present study was prompted by findings from previous studies, for instance, Qian's (1998, 1999, Nurweni & Read, 2000, Schmitt & Meara, 1997) research that some components of vocabulary knowledge in English play an important role in reading comprehension processes and that the two vocabulary measures contribute significantly to the prediction of reading performance. However, to conduct studies for the sake of Nigeria senior secondary school students, it was necessary to situate the research in the context of a mixed L1 population so that research findings would be applicable to the potential ESL examinee populations in Nigerian senior secondary schools.

This study did not test all vocabulary components because the depth-of-English-vocabulary-knowledge measure used (see details in the appendix) covers only three aspects (synomymy, polysemy, and collocation). Nevertheless, these aspects were assumed to be among the most fundamental among depth-of-English-vocabulary-knowledge factors, as they have been identified in almost all frameworks of vocabulary knowledge (e.g. Chapelle, 1998; Haastrup & Henriksen, 2000; Henriksen, 1999; Nation, 1990, 2001; Qian, 1998, 1999; Read, 1989, 1995, 2000). In order to achieve valid and reliable results, it was also desirable to include a statistically reliably vocabulary measure as a quality control standard. For this purpose, a senior secondary school level English as a second language vocabulary subtest (hereafter, ESL-Vocabulary Item Measure) composed of multiple-choice, single-sentence items testing knowledge of synonyms was adopted. Because tests on this vocabulary measure have consistently been statistically reliable in predicting reading performance (Schedl, Thomas, & Way, 1995), it seemed safe to assume that performance on this test would provide a reasonably good criterion against which the predictive values of other vocabulary measures could be compared. The following research hypotheses were formulated based on the findings form previous research regarding the relationship between learners' vocabulary size and reading comprehension, and in line with the argument that both breadth and depth of English vocabulary knowledge are closely interconnected and interdependent.

Research Hypotheses:

1. In Nigerian Senior Secondary School contexts, scores on depth and breadth of English vocabulary knowledge, on ESL-Vocabulary items, and on reading for basic comprehension will intercorrelate significantly with one another.
2. For Nigerian senior secondary school students, scores on depth of English vocabulary knowledge will contribute significantly to predicting the performance on reading for basic comprehension.
3. For Nigerian senior secondary school students, scores on English vocabulary size will contribute significantly to predicting the performance on reading for basic comprehension.
4. For Nigerian senior secondary school students, scores on ESL-vocabulary items will contribute significantly to predicting the performance on reading for basic comprehension.

Method

Participants

The participants in the study were 300 Nigerian senior secondary school students selected randomly from senior secondary school 1 – 3 across ten secondary schools in Ilorin metropolis.

Coming from (17) L1 backgrounds, the participants included speaker of Yoruba (223), Igbo (32), Ebira (10), Igala (6), Nupe (5), Fulani (4), Hausa (4) and 9 other ethnic languages (11). One hundred and sixty-five (165) were male and one hundred and thirty-five(135) were female. They represented three (3) different academic fields ranging from Science (109) to Arts (125) and Commercial (66). The majority (178) of the participants were between 16 and 20 years of age, 120 were under 16 years old, and only 2 were between 20 and 25 age range. Most of the participants were either SS3 (130) or SS1 (89) students. The rest were SS2 (81) students (see table 1 and 2 for details.

Instruments/Materials

Reading for Basic Comprehension Measure

This test was a standardized multiple-choice reading comprehension (hereafter ESL-RBC) selected from the senior secondary school textbooks as the criterion measure of reading for basic comprehension. Research and reading development specialists advised the selection. The subtest originally composed of six reading passages and 30 multiple-choice questions to measure comprehension, but because of the anticipated time constraints of administering the tests, considering that all the participants were volunteers, a need was suggested to shorten the test. As a result, a passage was randomly removed along with the comprehension questions attached to it. The resultant test had five passages, all reflecting general academic matters at introductory levels, including agriculture, geography, economics, English language and general prose. Five multiple-choice questions were attached to each passage for measuring comprehension. These questions are general straightforward, testing basic comprehension of the texts. This subtest did not contain vocabulary items in the comprehension questions. As such, the questions were judged appropriate for the purpose of measuring performance on reading for basic comprehension. The measure has a total of 25 comprehension questions.

Depth-of-English-Vocabulary-Knowledge Measure

The depth of English vocabulary-knowledge measure (DEVK) is intended to contribute to inferences about the test taker's depth of receptive English vocabulary knowledge as defined by Read (1995), by measuring three vocabulary elements: synonymy, polysem, and collocation. Originally called the Word Associates Test (WAT) or Word Associates Format (WAF), this measure was developed by Read (1989, 1993, 1995) to test depth of vocabulary knowledge in English. A recent form of the DEVK (Qian, 1999), obtained a reliability of 91 with a sample of 74 Korean and Chinese speakers. This DEVK version contains 40 items designed to measure two aspects of the depth of English vocabulary knowledge: meaning (synonymy, polysemy) and collocation, or the paradigmatic and syntagamatic relationship of words. These aspects of the DEVK measures, match some important components of the depth of English vocabulary knowledge proposed in the present study.

Each DEVK item consists of one stimulus or target word, which is an adjective, and two boxes, each containing four words. Among the four words in the left box, one to three words can be synonymous to one aspect of, or the whole meaning of, the stimulus word, whereas among the four words in the right box there can be one to three words that collocate with the stimulus word. The instruction on the test explains to the test taker that there are always four correct answers in each item. However, these choices or answers are not evenly spread. There are three possible situations: (a) the left and right boxes both contain two correct answers; (b) the left box contains one correct answer, and the right box contains three correct answers; and (c) the left box contains three correct answers, and

the right box contains only one correct answer. This arrangement effectively reduces the chances of guessing. An example follows:

Sound

logical healthy bold solid	snow temperature sleep dance

The correct choices for this item are *logical, healthy, and solid* in the left box and *sleep* in the right box. Most of the stimulus words are general academic adjectives. Although this DEVK measure taps only knowledge of adjectives, given the design of the measure, which requires the identification of nouns that collocate with the adjectives tested, nouns are actually indirectly tested as well. In addition, it appeared to be an efficient instrument, since 'the test could be completed by intermediate learners within 30 minutes' (Qian, 1999). Based on these considerations, the measures was selected for the research, and scores obtained from the DEVK were treated as the variable of depth of English vocabulary knowledge in the data analyses, to examine its relationship with the other variables identified in the study, and to evaluate the DEVK's predictive power in predicting reading fro basic comprehension performance. Results obtained from these analyses contributed to addressing research hypotheses 1 and 2.

Vocabulary Levels Test

The Vocabulary Levels Test (Nation, 1983) has been used to make inference about the test taker's English vocabulary size (Read, 2000) by measuring single meanings of content words at five frequency levels representative of five different English vocabulary size levels, namely the 2,000 word family level, the 3,000 word family level, the 5,000 word family level, the 10,000 word family level, and the university word-list level. The 2,000-and 3,000-word-family levels include high-frequency words; the 5,000-word-family level is a boundary level between the high-frequency level and low-frqeuency level; the 10,000 word-family level is composed of low-frequency words; and the university word list level contains specialized vocabulary needed for academic studies (Nation, 1983: 19:24). Not representing a frequency level, the vocabulary selected for the Nigerian senior secondary school students ESL level comprises words frequently appearing in Senior Secondary ESL textbooks.

The test has been accepted by a number of L2 researchers as an appropriate measure of vocabulary size (e.g., Laufer, 1992; Laufer & Paribakht, 1998; Qian, 1998, 1999; Yu, 1996). Because of the way the test was constructed, the change of guessing correctly is low, and testees' scores can be regarded as a close approximation to the proportion of words in the test that they know. Qian (1999) obtained a reliability of .92 for the measure. At teach vocabulary size level are six test items, each comprising six words and three definitions. The test taker is required to match the three definitions with three of the six words provided by writing the corresponding number of the word beside its definition, as in the example below. Each level contains 18 correct choices. Therefore, the maximum possible score for each of the five levels was 18 points.

1. ceiling
2. office $\underline{3}$ something that tells time
3. watch $\underline{5}$ main body of a tree
4. vehicle $\underline{6}$ a tool used for writing
5. trunk
6. pen

In this study, scores obtained from the Vocabulary Levels Test were used as the English vocabulary size variable in the analyses, to examine its relationships with the other variables identified in the study, and to examine its power of predicting reading comprehension performance. Results obtained from these analyses contributed to addressing research hypotheses 1 and 3. As the conceptual dimension of vocabulary size in English was operationalized in this measure, in the present study, the measure is hereafter referred to as the English vocabulary size (EVS) measure.

EVS-Vocabulary Item Measure

This is a vocabulary measure developed for the present study following the generally familiar format of the English vocabulary knowledge test advocated by both L1 and L2 researchers in general, and, in particular, by the ESL examining bodies such as the West African Examinations Council and other allied examiners in Nigeria. The test, which mainly measures the knowledge of English synonyms in a limited context, contains 30 vocabulary items. All the items in this measure are multiple-choice questions requiring the test taker to select words close in meaning to, or synonymous with, the stimulus words provided in isolated sentences. Each target word is underlined within a single-sentence context. The sentences were taken from written academic materials, and the words selected for testing are those that appear relatively frequently in academic texts across a range of participant's school subjects. Because of its consistent reliability in contributing to the prediction of reading performance (Schedl, Thomas & Way, 1995), this vocabulary measure was selected for the study as a quality control standard against which the unique claims of depth and size could be measured. For this purpose, scores generated from this measure were applied as a variable called ESL-VIM in the analyses, to determine its correlational relationship with the other variables in the study, and its value in predicting reading comprehension performance. Results from the analyses were used to address research hypotheses 1 and 4.

Scoring of the Instruments

In scoring the instruments, each word or option correctly chosen in each test was worth or awarded one-point. Therefore, the maximum possible scores for the DEVK was 160 points for the 40 items, for the EVS was 90 points for the 30 items, for the ESL-VIM was 30 points for the 30 items, and for the ESL-RBC was 25 points for the 25 items. There was no penalty for providing incorrect answers. A wrong answer was simply awarded zero and if an item was left unanswered no score was awarded.

Coding of the Instruments

In this study, 300 randomly selected senior secondary school students were involved. Analysis of how this number was arrived at is given in Tables 1 and 2 on the basis of participants' educational level, academic field, age range, gender, and L1 identity. Thus the various educational levels of participants were coded (SSS1, SSS2 and SSS3) where their various academic fields were coded (Science, Arts, and Commercial) and their age range were coded (below 16, 16-20, and 20-25) respectively. The participants' gender were code (male or female) either their L1 identity were coded (Yoruba, Hausa, Igbo, etc) (See Table 2 for details). In a similar manner, the depth of English vocabulary knowledge was coded (DEVK) whereas the breadth of English vocabulary knowledge (originally called the vocabulary levels test and operationalized in this study as the English vocabulary size) was coded (EVS), and the vocabulary items taken from written academic texts across a range of senior secondary school subjects testing knowledge of synonyms in a limited single-sentence context, was coded (ESL-VIM). By the same token, the standardized multiple-choice reading comprehension passage selected from the senior secondary school textbooks as the criterion measure of reading for basic comprehension was coded (ESL-RBC).

Validation and Reliability for the Instruments

The study went through a process of repeated piloting and refining. At various stages, experts in English language teaching and examining as well as reading and research development specialists, critiqued and scrutinized the reading comprehension measure as well as the English vocabulary knowledge measures. The researcher reflected all the suggestions that they offered. As explained earlier, the original reading comprehension test was composed of six reading passages and 30 multiple choice questions to measure comprehension, but because of the anticipated time constraints of administering the tests, considering that all the subjects were volunteers, a need was suggested to

shorten the test. As a result, a passage was randomly removed along with the comprehension questions attached to it. The resultant test had five reading passages with 25 multiple-choice questions which were considered adequate for the purpose. Also, because of a concern that some key answers to some items in the DEVK were considered ambiguous and equivocal, minor modifications were suggested on those items and the researcher reflected all the suggestions offered.

In terms of the reliability of the instruments, the tests were first given to a randomly selected trial group of 30 senior secondary school students. Using the test-retest reliability method, the tests were administered twice to the students with a three-week reliability method, the tests were administered twice to the students with a three week lapse between testing. The first and second test scores on the instruments were recorded separately. A correlation coefficient was then calculated using the Pearson product-moment correlation statistics to measure the amount of relationship between subjects' first and second test scores and the reliability values of 89, 83, 999, and 79 were obtained for ESL-RBC, DEVK, EVS and ESL-VIM respectively (See table 3 below). These results confirmed that the instruments were appropriate for the purpose.

Procedure for Data Collection

All the test instruments were administered to participants in single sessions. The subjects all attended and returned the instruments. As the sole administrator of the tests, the present researcher ensured that all testing sessions were conducted within the same time frame in each of the ten participating secondary schools. The subjects were given two hours to complete the four tests along with the background questionnaire. The participants received the same instructions and explanations just as identical instructions for administering the instruments were received by the test supervisors.

In the end, the supervisors who were English teachers of the selected schools collected the responses. Such responses were later submitted to this researcher along side the personal observations and remarks, which the supervisors had made while administering the instruments.

Techniques for Data Analysis

In this study, data were analysed using several techniques. First, descriptive and reliability statistical analyses in terms of percentage, mean scores on all four measures, standard deviations, and obtained score ranges on the ESL-RBC, DEVK, EVS, and ESL-VIM, were performed on the data.

Second, two-tailed Pearson product-moment correlations and multiple regression model were chosen as the dominant techniques for statistical analyses. SPSS (Statistical Package for Social Sciences) was used to conduct analyses on the data. Two-tailed product moment correlations were computed for scores from the DEVK, EVS, ESL-VIM and ESL-RBC to determine the intercorrelations among the four tests. A two-tailed test is used in reference to a non-directional hypothesis that does not make specific prediction about the outcome a study will take (Balian, 1982:34). Research hypotheses are either directional (one-tailed) or non-directional (two-tailed, depending on whether or not a direction of expected difference or relationship could be ascertained (Balian, 1982:40). To determine whether the differences in these correlations were statistically significant, t-test for the difference between dependence correlation coefficients were conducted. In the regression analysis, the scores on the ESL-RBC were used as the dependent variables. The predictive values of DEVK, EVS, and ESL-VIM in explaining the variance in ESL-RC were investigated further in a series of step-wise multiple-regression analyses. The focus of the analyses was on examining the magnitude of R^2 changes (that is, R^2 of the correlation coefficients between each predictor variable and the criterion variable). All these were undertaken for the present researcher by a lecturer in Computer Statistics at Al-Hikmah University, Ilorin using the Computer Unit of the University.

The .05 alpha level was adopted for this study as dictated by research precedent, since "it is where most educational researchers accept that the chance of error is settled" (Olajide, 1991L308).

Although the .05 and .01 alpha levels are by far most traditionally accepted in most research work (Balian, 1982:146), the .05 alpha or significance or "cut-off" level was chosen for the present study.

This was because, first, it is important to understand that if alpha level is set too high (e.g., .01) many statistical tests can yield "significant" findings but rejecting the null hypothesis when, in fact, it really is true, may result. Second, if alpha level is set too low (e.g., .001) a true significant finding may not be recognized, since it is not good enough to be statistically significant (Balian, 1982:147).

Table 1 & 2 above show the participants involved in the study in terms of level of education, academic field, age range, gender, and L1 identity. It is clear from the tabulation that the participants come from 17 L1 backgrounds.

Descriptive and Reliability Statistics

Table 3: **Means, Standard Deviations, Reliabilities and Obtained Score Ranges on ESL-RBC, DEVK, EVS and ESL-VIM**

Variable	MPS	M (%)	SD	Obtained Range		D	Reliability (Alpha)
				Minimum	Maximum		
ESL-RBC	25	16.14(65)	4.50	03(12)	25(100)	22	0.89
DEVK	160	133.37(83)	19.66	26(16)	160(100)	134	0.83
EVS	90	75.67(84)	15.47	02(2)	90(100)	88	0.99
ESL-VIM	30	17.84(59)	6.59	03(10)	30(108)	27	0.79

NB: MSP: Maximum Possible Score, N = 300,
M = Means, SD = Standard Deviation,
D = Difference between Maximum and Minimum ranges obtained.

Table 3 above show the results of descriptive and reliability analyses. The table summarizes the means, standard deviations, test-retest reliabilities and obtained score ranges for the full samples. To provide a common ground for comparison, the percentage scores for the means and obtained score ranges are also listed in the parenthesis in the table. As shown in the tables, in terms of percentage, the mean scores on all four measures are generally comparable. There is a reasonable spread of the obtained score ranges and standard deviations, and the reliabilities are as acceptable levels.

Variable	ESL-RBC	DEVK	EVS	ESL-VIM
ESL-RBC	-	0.52**	0.49**	0.53**
DEVK		-	**0.53****	**0.46****
EVS				
ESL-VIM				-

Note: N = 300
**Correlation is significant at the 0.01 level (2-tailed) (i.e.; ** P < 0.01 (2-tailed).

Addressing the Research Hypotheses

Research hypothesis 1 stated that in Nigerian senior secondary school contexts, scores on depth and breadth of English vocabulary knowledge, on ESL- vocabulary items, and on reading for basic comprehension will intercorrelate significantly with one another. As shown in table 1 above, the intercorrelations among the four variables appear to be moderate. According to Cohen (1988:80), a correlation of .50 is generally regarded as indicating a 'large correlational effect size' or at least 'a moderate positive relationship' (Hamilton, 1990:481) between any two variables considered. Glatthorn (1998:69) also claims that 'size of correlation sufficient for use of results (group predictions require .40 - .60; individual, 75)'. IN fact, in the table two things are particularly worth noting: (a) the correlation between DEVK and ESL-RBC is slightly higher than that between EVS and ESL-RBC, and (b) the highest correlation appears to be the one between ESL-RBC and ESL-VIM, and that between EVS and DEVK with a tie value of 0.53. To determine whether the differences in these

correlations are statistically significant, t-tests for the difference between dependent correlation coefficients were conducted. A correlation coefficient is the number which quantifies a relationship between two variables; it tells us whether a score on one variable associated in any way with a score on the other variable, that is, if high scores on one variable (measure) correspond with high scores on the other, discuss as said to be positively correlated (Ibrahim, Landu, & Opadokun, 2004:81). The results are all grater than the critical z value of 1.96, which indicates that there is no significant difference between any pair of correlation between DEVK and ESL-RBC (10.51), EVS and ESL-RBC (9.70), and ESL-VIM and ESL-RBC (10.79). In other words, all these vocabulary measures are related to reading for basic comprehension scores to a relatively similar degree of strength. Thus, the null hypothesis is rejected and the alternate hypothesis retained, since the values of t-calculated are greater than the tabulated t-values.

Table 5: R-Squares of the Correlation Coefficients between Each Predictor Variable and the Criterion Variable

Criterion Variable	Predictor Variable	R^2
ESL-RBC	DEVK	0.27**
	EVS	0.24**
	ESL-VIM	0.29**

**P $<$ 0.01

Table 5 above presents values of R^2 of the correlation coefficients that were put to the significance testing. R-squared (R2) is the square of the correlation coefficients which is used for judging the explanatory power on the linear regression of the dependent variable on the independent variable(s); it show the percentage of the total variation of the dependent variable that can be explained by the independent variable (Glass & Hopkins, 1996:66). As shown in the table, DEVK alone explains about 27% of the variance in the criterion variable ESL-RBC, EVS alone explains about 24% of the variance in ESL-RBC, AND ESL-VIM alone explains about 29% of the variance in ESL-RBC. These values are all significant at P $<$ 0.01, which confirm hypotheses 2, 3 and 4 that for senior secondary school students, scores on depth of vocabulary knowledge (DEVK), scores on vocabulary size (EVS), and scores on ESL- vocabulary item (ESL-VIM) contribute significantly to predicting the performance on reading for basic comprehension, thus, research hypotheses 2, 3 and 4 are retained.

In order to determine the magnitude of R2 change in explaining the variance in ESL-RBC, the predictive values of DEVK, EVS, and ESL-VIM were investigated further in a series of step wise multiple-regression analysis as presented in the table below. A step-wise analysis is 'a variance of forward approach where correlations between the independent variables and dependent variable are obtained' (Abiri, 2006:163).

Table 6: Multiple Regression Results of the full Sample (N=300) with scores on the DEVK, EVS and ESL-VIM as the Independent Variables

Stepwise Procedure	Variable Status	R^2	R^2 Change	F Change
Force Entry	DEVK in 1st EVS In 2nd	0.27 0.33	0.27 0.06	109.70 28.01
Force Entry	EVS in 1st DEVK in 2nd	024 0.33	0.24 0.10	92.47 42.34
Forced Entry	DEVK in 1st ESL-VIM in 2nd	0.27 0.40	0.27 0.13	109.70 63.20
Forced Entry	ESL-VIM in 1st	0.29	0.29	119.12

	DEVK in 2nd	0.40	0.11	55.07
Forced Entry	EVS in 1st ESL-VIM in 2nd	0.24	0.24	92.47
		0.36	0.12	54.67
Forced Entry	ESL-VIM in 1st	0.29	0.29	119.12
	EVS in 2nd	0.36	0.07	32.20
Forced Entry	DEVK in 1st	0.27	0.27	109.70
	EVS in 2nd ESL-VIM in 3rd	0.33	0.06	28.01
		0.42	0.08	42.58
Forced Entry	EVS In 1st	0.24	0.24	92.47
	DEVK In 2nd	0.33	0.10	42.34
	ESL-VIM in 3rd	0.42	0.08	42.58
Forced Entry	EVS in 1st ESL-VIM In 2nd	0.24	0.24	92.47
		0.36	0.12	54.67
	DEVK in 3rd	0.42	0.06	30.71
Free Entry	ESL-VIM in 1st	0.29	0.29	119.12
	DEVK in 2nd	0.40	0.11	55.07
	EVS in 3rd	0.42	0.02	09.49

Table 6 above presents the stepwise multiple regression results of the full sample on the independent variables using the forced entry in the main, and free entry procedures.

DEVK and EVS: with DEVK entered into the model at the first step and EVS entered at the second step, the R^2 was 0.27 (F change = 109.70, P < 0.05) and 0.33 (F change = 28.01, P < 0.05) respectively. The entry of EVS at the second step changed the size of the R^2 to 0.33 showing an increase of 0.06 i.e. 6% of the explained variance in ESL-RBC. In other words, EVS provides an additional 6% of the criterion variable over and above DEVK. A fresh model was then built with EVS entered at the first step and DEVK entered at the second step. At this point, the R^2 was 0.24 (F change = 92.47, P < 0.05) for EVS. The entry of DEVK at the second step changed the size of the R^2 to 0.33 (F change = 42.34, P < 0.05), showing an increase of 0.10 i.e., 10% of the explained variance in ESL-RBC. That is, DEVK provides an additional 10% of the criterion variable over and above VS.

DEVK and ESL-VIM: With DEVK entered into the model at the first step, the R^2 was 0.27 (F change = 109.70, P < 0.05) and ESL-VIM entered at the second step the size of the R^2 changed to 0.40 (F change = 63.20, P < 0.05), showing an increase of 0.13 i.e. 13% of the explained variance in ESL-RBC. This indicates that ESL-VIM provides an additional 13% of the criterion variance over and above DEVK. A fresh model was then built with ESL-VIM entered at the first step and DVK entered at the second step. The R^2 was 0.29 (F change = 119.12, P < 0.05) for ESL-VIM and 0.40 (F change = 55.07, P < 0.05) for DEVK. The entry of DEVK at the second step changed the size of R^2 to 0.11 i.e. 11%. This implies that DEVK provides an additional 11% of the criterion variance over and above ESL-VIM.

EVS and ESL-VIM: With EVS entered at the first step and ESL-VIM entered at the second step, the R^2 was 0.24 (F change = 92.47, P < 0.05) for EVS. The entry of ESL-VIM at the second step changed the size of the R^2 to 0.36 (F change = 54.67, P < 0.05), showing an increase of 0.12 i.e. 12% of the explained variance in ESL-RBC. That is, ESL-VIM provides an additional 12% of the criterion variable over and above EVS. A fresh model was then built with ESL-VIM entered at the first step and EVS entered at the second step. At this point, the R^2 was 0.29 (F change = 119.12, P < 0.05) for ESL-VIM. The entry of EVS at the second step changed the size of the R^2 to 0.36 (F change = 32.20, P < 0.05), showing and increase of 0.07 or 7% of the Explained variance in ESL-RBC. That is EVS provides and additional 7% of the criterion variance over and above the ESL-VIM.

DEVK, EVS and ESL-VIM: still using the forced entry procedure with DEVK entered into the model at the first step, R^2 was 0.27 with a corresponding F change value of 109.70, $P < 0.05$. The entry of EVS at the second step gave an R^2 value of 0.33 (F change = 28.01, $P < 0.05$). An additional entry of ESL-VIM into the model at the third step increased the size of the R^2 to 0.42 (F change = 42.58, $P < 0.05$). With the entry of EVS at the second step, the size of the R^2 changed, providing an additional 6% of the criterion variance over and above DEVK. On further entry of ESL-VIM into the model the R^2 change was 0.08 (8%), indicating an increase of 0.08 (8%) of the explained variance in ESL-RBC. That is, ESL-VIM provides an additional 8% of the criterion variance over and above DEVK and EVS. A fresh model was then built with EVS entered at the first step, DEVK at the second step, and ESL-VIM at the third step. At this point, the R^2 was 0.24 (F change = 92.47, $P < 0.05$) for EVS. The entry of DEVK at the second step changed the size of the R^2 to 0.33 (F change = 42.34, $P < 0.05$), showing an increase of 0.01 (10%) of the explained variance in ESL-RBC. The entry of ESL-VIM at the third step, however, increased the R^2 value by 8%. That is, ESL-VIM provides an additional 8% of the criterion variance over and above EVS and DEVK.

Another model was build with **EVS, ESL-VIM,** and **DEVK** entered in that order. With EVS entered at the first step, the R^2 was 0.24 (F change = 92.47, $P < 0.05$). The entry of ESL-VIM at the second step gave an R^2 value of 0.36 (F change = 54.67, $P < 0.05$). With an additional entry of DEVK at the third step, the R^2 was 0.42 (F change = 30.71, $P < 0.05$).

However, with the entry of ESL-VIM at the second step, the size of the R^2 changed, providing an additional 12% of the criterion variance over and above EVS. On further entry of DEVK into the model, the R^2 change was 0.06 (6%), indicating an increase of 6% of the explained variance in ESL-RBC. That is DEVK provides an additional 6% of the criterion variance over and above EVS and ESL-VIM.

ESL-VIM, DEVK and EVS: Using the free entry procedure, this time, ESL-VIM entered first followed by DEVK and EVS. The R^2 values were 0.29 (F change = 119.12, $P < 0.05$), 0.40 (F change = 55.07, $P < 0.05$) and 0.42 (F change = 9.49, $P < 0.05$) respectively. The entry of DEVK however, at the second step and EVS at the third step resulted in R^2 change of 0.11 and 0.02 respectively. This shows that DEVK entered at the second step yielded an additional 0.11 (11%) of the criterion variance over and above ESL-VIM. Yet, the entry of EVS at the third step increased the explained variance in ESL-RBC by 0.02 (2%).

In summary, all changes in the magnitude of the shared variances (R^2) have been statistically significant, which suggests that, in predicting performance on the ESL-RBC, using any combination of two variables among DEVK, EVS and ESL-VIM will yield better results than using one of them alone or using the three together as shown in table 3 where the entry of a third variable into the stepwise multiple regression model yielded a negligible value of R^2 change (2 – 8%). It is also note worthy that for all variables considered in combinations of two, order of entry do not seem to matter, given that the R^2 were relatively similar in each of the above cases after the variables were entered. The results presented above indicate clearly the significance of both breadth and depth of English vocabulary knowledge in reading for basic comprehension using tests performance as the basis for prediction.

Discussion

Discussing the statement of the research hypotheses, we have found that, in the context of Nigerian senior secondary school students coming from (17) L1 backgrounds, scores on the DEVK, EVS, ESL-VIM and ESL-RBC and moderately intercorrelated, since the Pearson correlation coefficients for the scores on the variables were all higher than 0.40 ($p < 0.1$). In other words, significant and positive intercorrelations existed among the scores on the four tests. This supports hypothesis 1. However, the significance testing showed that the magnitudes of the correlation coefficients between each predictor variable and the criterion variable do not differ significantly,

which implies that all these vocabulary measures are related to reading for basic comprehension scores to a relatively similar degree of strength. Besides, there appears to be a moderate correlation (r = 0.53) between the depth of English vocabulary knowledge and English vocabulary size scores which may be due to the partial construct overlap of the two measures: the EVS measures primary meaning of words, while the DEVK measures knowledge of synonymy, polysemy, and collocation. Although the DEVK tests more and deeper aspect of English vocabulary knowledge than the EVS, primary meaning is, in certain cases, part of synonymy and polysemy, and knowledge of word meaning sometimes has an impact on knowledge of collocation.

In the multiple regression analysis, the results showed that both DEVK and EVS contributed significantly to the prediction of reading for basic comprehension and that DEVK added a noticeable (10%) of explained variance in ESL-RBC over and above the prediction already afforded by EVS. This finding confirms hypotheses 2 and 3. However, the correlation (r =0.53) between the ESL-VIM and ESL-RBC in this study corroborates the consistent reliability, validity and capability of ESL-VIM in predicting performance on reading for basic comprehension. This result confirms hypothesis 4.

The results of the multiple regression analysis indicate that in building regression models with any pair of the three predictors, DEVK, EVS, ESL-VIM, no matter what the combination and what the order of entry, all R^2 changes even though small (6-13%, p < 0.01) turned out to be statistically significant. These results contribute to understanding the significance of English vocabulary knowledge in reading comprehension, particularly among Nigerian senior secondary school students.

Conclusions and Implications

The present study has shown with empirical evidence that, in Nigerian senior secondary school settings, depth and breadth of English vocabulary knowledge are closely and positively associated not only with each other, but also with students' performance on reading for basic comprehension, and that the students' depth of English vocabulary knowledge is an important factor in the relationship between vocabulary knowledge and academic reading for basic comprehension. Meanwhile, the study has also confirmed the importance of breadth of English vocabulary knowledge in this relationship.

As the present research shows, while meaning is very important, vocabulary knowledge in English can no longer be regarded as a simple matter of recognition of superficial word meanings. Vocabulary knowledge in English not only has breadth, as represented by the number of words known to a learner, but also has depth. The definition of depth of English vocabulary knowledge established in the present study involves a good number of aspects representing various types of linguistic knowledge. The importance of depth of English vocabulary knowledge in predicting performance on academic reading has been established in the present study based on empirical evidence. We can now see that, to improve students' academic reading for basic comprehension, at least two components of English vocabulary depth need serious attention. First, in addition to primary meanings of words, synonymy and polysemy are also important elements that should be introduced in the classroom. Second, syntactic properties of words, in particular, their collocability and collocational relations with other words, are also well worth students attention, since the levels of these aspects of word knowledge are so positively associated with those of academic reading for basic comprehension.

Limitations and Suggestions for Future Research

Although our findings in general demonstrate close and positive correlation between depth and breadth of English vocabulary knowledge comprehension among Nigerian senior secondary school students, we are aware of the limitations imposed on our interpretations by our shortening the ESL-RBC measure to meet time constraints, considering that all the participants were volunteers. The shortening of the ESL-RBC measure may have resulted in less-than-ideal quality in the data. Had the ESL-RBC been longer, as it was originally developed, it could have measured reading for basic comprehension more accurately, and its results could have been more statistically reliable. Furthermore, had the ESL-RBC been kept at its original length of 30 items, there would have been a

wider range of scores, which might in some ways have improve the results of the analyses. Nevertheless, we are encourage to have confidence in the validity of our findings, bearing in mind, first, the relative consistency of the present results with those of previous research, the high reliability of the measures employed, and finally, the robustness of our findings given the educational level of our study.

It must, however, be mentioned that the study presented here examined the contributions of English vocabulary size and depth measures, the DEVK covers only three components of depth of English vocabulary knowledge, namely, synonymy, polysemy, and collocation. Recalling that the dimension of depth of vocabulary knowledge in English phraseological features, it is obvious that the concept of depth of English vocabulary knowledge was only partially operationalized in the study and therefore, caution should be exercised in generalizing a findings from this research.

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