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Conceptualization of Depth of Vocabulary Knowledge with Academic Reading Comprehension

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Abstract

The present study embodies a conceptual framework, and it studies the concept regarding the depth of vocabulary knowledge. Literature review is employed as a foundation for developing the conceptual framework for the present study. The current study suggests that different dimensions of depth of vocabulary knowledge, namely paradigmatic relations, syntagmatic relations, analytic relations and morphological knowledge need to be included as integral parts of depth of vocabulary knowledge to examine their correlation and prediction on academic reading comprehension. In addition, different relationships of paradigmatic relations, syntagmatic relations, analytic relations and morphological knowledge with reading comprehension are explored. At last, the paper suggests a conceptual framework

of depth of vocabulary knowledge and its relationship with academic reading comprehension, and future research works need to encompass paradigmatic relations, syntagmatic relations, analytic relations and morphological knowledge as integral parts of depth of vocabulary knowledge in relation with academic reading comprehension.

Keywords: conceptual framework, depth of vocabulary knowledge, paradigmatic relations, syntagmatic relations

Introduction

According to Meara (1996), teachers of English and lexical researchers have accepted the fact that competence in lexical knowledge lies in the nucleus of good communicative ability, and the knowledge of vocabulary has definitive predictive power over the skilled ability of learners in a foreign (FL) or second (L2) language. Meara (1996) argues that students who possess more vocabulary knowledge are better skilled in language use than students who have less vocabulary knowledge. Researchers (e.g., Chapelle, 1998; Read, 1989, 1993, 1998, 2000; Richards, 1976; Wesche & Paribakht, 1996; Nation, 1990, 2001; Henriksen, 1999; Qian, 1988, 1999, 2002) who deal with L2 vocabulary do not reckon the knowledge of vocabulary having only one particular aspect, but they view that vocabulary knowledge has manifold dimensions. Qian (1999), Wesche and Paribakht (1996), Read (1989) affirm that the knowledge of vocabulary needs to encompass minimally two features, i.e., breadth or size of vocabulary and quality or depth knowledge regarding vocabulary.

The size or breadth of vocabulary refers to the number of words a learner knows, i.e., the learner needs to possess minimal knowledge of the meaning of the words whereas vocabulary depth knowledge denotes how deeply a learner has knowledge of a word (Qian & Schedl, 2004; Qian, 2005). The facet of vocabulary depth knowledge can include different elements, such as, spelling,

pronunciation, meaning, frequency, register, and syntactic, morphological traits (Qian, 1998, 1999). According to Qian (2002), in the area of L2 research, lexical researchers have hardly recognized the significant part the vocabulary depth knowledge plays till presently, and he further contends that there are few empirical studies which report the association between reading comprehension and vocabulary depth knowledge (Qian, 1998, 1999; de Bot, Paribakht, & Wesche, 1997).

Vocabulary researchers have mainly focused on the significant part played by vocabulary breadth or size on reading success (i.e., Na & Nation, 1985; Laufer, 1992, 1996). Most likely, the reason behind this is that in comparison with vocabulary size, vocabulary depth knowledge is tougher to test (Schmitt & McCarthy, 1997). Qian (2002) argues that both breadth and depth dimensions deserve equal attention for investigating the significant part vocabulary knowledge plays in reading comprehension; as a result, measures which have capability to evaluate vocabulary depth knowledge efficiently get imperatively sought after. Stæhr (2009) points out that research related to language skill and vocabulary knowledge has about entirely concentrated on reading comprehension in English. An empirical, careful enquiry into the degree to which the knowledge of vocabulary becomes contributor to skills that have language orientation is required for comprehensively discovering the significant part vocabulary knowledge plays in L2 proficiency.

Overview of the Study

Keeping the above discussion into perspective, the present conceptual paper does rationale about taking up the following different dimensions of depth of vocabulary knowledge and include different dimensions of vocabulary knowledge, namely paradigmatic relations (synonyms, hyponymy, antonymy), syntagmatic relations (collocation), analytic relation (meronymy) and morphological knowledge (affixes) as integral parts of depth of vocabulary knowledge to examine their correlation and prediction on academic reading comprehension.

To the best knowledge of the researchers, there is considerable lack of empirical research which deals with the relationship and prediction of the said different dimensions as indispensable parts of vocabulary depth knowledge on reading comprehension; as a result, it becomes evident that further vocabulary researchers would find the investigation of vocabulary knowledge and reading comprehension in this paper valuable.

Keeping the objectives mentioned above in line, the current research paper deliberates on the literature review of the manifold aspects of vocabulary depth knowledge and L2 reading comprehension. Furthermore, the latter part of this paper adds on the significance of the study of different parts of depth of vocabulary knowledge with reading comprehension. After the discussion of the importance of different parts of depth of vocabulary knowledge, the conceptual framework of the current study is provided. Then, the present research work summarizes the whole paper with conceptual framework by drawing conclusion and providing implications of the study.

According to Schmitt (2010), L2 vocbualry research scholars have not been able to come up with a theory of vocabulary knowledge as such till to date in comparison with a theory like universal grammar proposed by Noam Chomsky. The underlying reason for this is that the findings of the study of the prominent L2 vocabulary research scholars, such as Laufer (1998), Meara (1996), Nassaji (2006), Nation (2001), Nation and Meara (2002), Nation and Waring (1997), Paribakht and Wesche (1997), Qian and Schedl (2004), Read (2007) show varying results regarding vocabulary knowledge and reading comprehension, and on the basis of those results, it is observed that L2 vocabulary research scholars fail to come up and qualify with/for a theory of vocabulary knowledge as such. For the reason mentioned above, the researcher discusses on the issues and literature review of different parts of depth of vocabulary knowledge and academic reading comprehension.

Literature Review

Manifold aspects of knowledge of vocabulary depth

It has been already discussed that the knowledge of vocabulary *depth* refers to how well a student knows a word (Read, 1993, 2000). Nassaji (2004) expresses that the knowledge of a word involves complexity and multi-dimensionality. Also, with the reference to research scholars, it has been discussed previously that a word associates different types of knowledge, which ranges from the knowledge of its spelling, pronunciation, register, morphological and stylistic attributes to syntactic knowledge and knowledge regarding semantic associations of a word with other words, i.e. the said knowledge includes the knowledge of meanings of collocates, and knowledge regarding antonymy, synonymy, and hyponymy. The aspects of knowledge of vocabulary, which are included in the present research purpose are elaborated in the following.

Paradigmatic relation

According to Schmitt (2000), both syntagmatic associations and paradigmatic associations consider the word class (i.e., part of speech) of the associations (i.e., word associations). He adds that answers of similar word class as the stimulus are called paradigmatic. The examples of paradigmatic association can be verb-verb pairs, such as *abandon-desert, abandon-leave,* and *abandon-eject.* Schwartz and Katzir (2012) assert that paradigmatic relations are known as hierarchically vertical, like subordination and superordination, and they represent hierarchical relationships between words. For instance, the superordinate category *furniture* encompasses the following subordinate-level groups, such as *table, chair, bed,* etc. (Schwartz and Katzir, 2012). In turn, the basic-level notion under paradigmatic sense relations is able to comprise subdivisions. For example, the category *spoon* can get subdivided into the sub-ordinate level categories, like *soup spoon, tea spoon, coffee spoon,* etc. Moreover, paradigmatic sense relations articulate a bondage

between the meanings of words. For instance, some words provide lexically opposite meanings (antonyms), such as *clean-dirty, hot-cold*.

Synonyms

Synonyms are words that contain almost similar meanings (Schmitt, 2000). Considering the following items, such as *expire, die, bite the dust, pass away, kick the bucket, give up the ghost,* one can realize that the six instances are synonyms which give the meaning "to die". Moreover, the synonyms above are consisted of two single words, a phrasal verb, and three idioms. Finegan (2008) expresses that two words are considered as synonyms if they convey the same meaning. The words *film, movie, flick*, and *motion picture* possess similar referents in the practical world, and they are termed to have synonymous relations. For instance, every flick is a film, and every film is a flick, so the words *flick* and *film* are synonymous. Considering the above examples, it can be said that the "vice versa" is significant.

Schmitt (2000) illustrates that words are connected with each other in many ways; one of the two examples is that the meaning of a word is dependent on its linkage with similar words, generally via sense relations. The other one is that words under a word family are linked to one another via a shared base form, but separate inflectional and derivational affixes. Schmitt (2000, pp. 25-26) explains that sense relations means the categories of meaning (interrelationship between words). The sense relations can be illustrated by the following table:

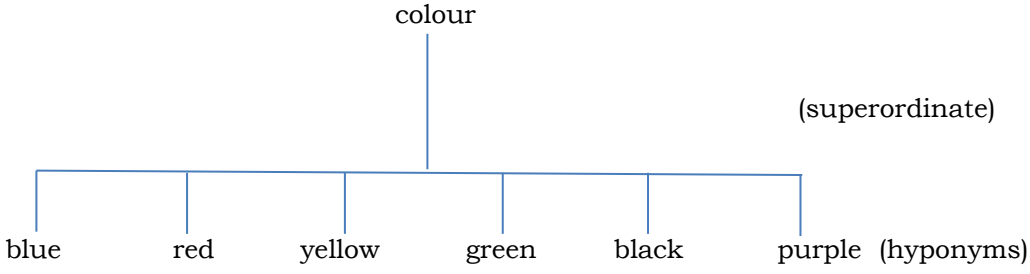
Table 1: Sense Relations

Sense Relation	**Word**	**Attribute**	**Example**
synonymy	synonym	similarity	huge-gigantic rich-wealthy
ungraded antonymy	ungraded antonym	exclusive oppositeness	alive-dead pass-fail
graded antonymy	graded antonym	oppositeness on a continuum	big-little hot-cold
hyponymy	hyponym superordinate (hypernym)	more general category	vehicle-car fruit-apple
meronymy	meronym	whole-part	bicycle-wheels handle, seat

(Source: Schmitt, 2002: pp. 26)

Hyponymy

According to Finegan (2008), a hyponym is "a subordinate, specific term whose referent is included in the referent of a superordinate term" (Finegan, pp. 189). For example, it can be said that blue is one type of colour, and also red is another type of colour. Blue and red are specific colours whereas *colour* is known as a general term for all the colours. The following diagram will enable us to understand the relationship between specific colours and the general term *colour*.



(source: Finegan, 2008: 189)

From the above diagram, it is obvious that the lower words are the hyponyms (i.e., *hypo-* refers 'below'), and the higher word *colour* is considered as superordinate (hypernym).

Antonymy

Finegan (2008) expresses that the term antonymy stems from the Greek root word *anti-* (means 'opposite'), and the word implies opposition in terms of meaning. He also adds that antonyms has binary association which is able to classify a linkage between only two words concurrently. He contends that the archetypical antonyms are generally known as pairs of adjectives which impart opposite ideas, for example *wide* and *narrow*, *large* and *small*, *married* and *single*, *hot* and *cold*, *alive* and *dead* (Finegan, 2008: 185). Antonymy is not confined only to adjectives. Nouns, like *man* and *woman* are also antonyms. The example of an antonymous pair of adverbs is *always* and *never*. The verbs *love* and *hate* form antonymous relationship. From the examples above, it is obvious that antonymy possesses binary relationship.

Syntagmatic

Schmitt (2000) defines that responses that provide a sequential associations to the stimulus word are known as syntagmatic. He further adds that syntagmatic association generally is made up of different word class. The examples can be verb-noun pairs, such as *abandon-ship* and *abandon-hope*. According to Schwartz and Katzir (2012), syntagmatic sense relations reflect horizontal association between items by furnishing information regarding the appearance, location, or the use of the object. For example, "A watermelon is sweet and tasty" is an example of descriptive characteristic; "A hammer is something to pound with" provides functional description (Schwartz and Katzir, 2012).

Collocations

Sadeghi (2009) describes that the word *collocation* is comparatively a recent phenomenon to the lexicon of English. He also adds that Firth (1957) is the first person who formally introduces the term 'collocation' to the discipline of Linguistics. Nation (2001) defines that the word 'collocation' refers to a group

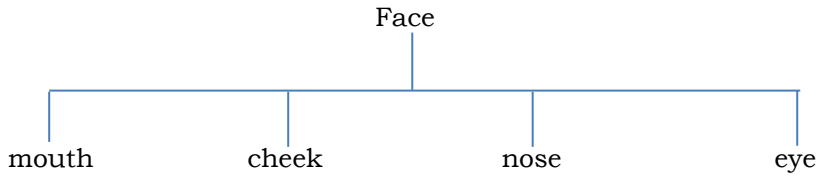
of words which fit in together. In other words, he describes that collocation as any commonly acknowledged grouping of words into phrases or clauses. Schmitt (2000) expresses that collocation denotes to the propensity of two or more words to coincide in discourse. Collocations come under syntagmatic relationship. He also mentions that there are two types of collocations; the first one is grammatical/syntactic, and the second one is semantic/lexical collocation (Benson, 1985). The present study aims to study the second type of collocation i.e., lexical collocation, and they generally are made up of two fundamentally "equal" words, for example, noun + verb (*ball bounces, withdraw an offer, inflict a wound*), adjective + noun (*cheerful expression, a crushing defeat*), noun +verb (*blizzards rage*), noun $_1$ + noun $_2$ (*a pride of lions*), adverbs and adjective (*deeply absorbed*), verb + adverb (*appreciate sincerely*) where both of the words contribute to the meaning (Bahns, 1993; Benson, 1985).

Bahns (1993) mentions that the term collocation has been applied and understood in various ways. However, the discussion of different understanding of the term is beyond the scope of the present study. Instead, it would be worthwhile to quote a short account of the way Benson, Benson, and Ilson (1986) have used this term:

> "In English, as in other languages, there are many mixed, identifiable, non-idiomatic phrases and constructions. Such groups of words are called recurrent combinations, fixed combinations, or collocations." (1986: ix)

Analytic

Schwartz and Katzir (2012) profess that another type of lexical hierarchy known as partonomic among academicians. Partonomic is commonly recognized as a part-whole hierarchy (meronymy or holonymy). For example, the case of body parts (head-nose) is an example of meronymy. Read (2004) places meronymy under analytic sense relations. A diagram in the following can be provided to understand part-whole relationship:



(Source: Finegan, 2008: 191)

From the diagram above, it is obvious that eye is a 'part of the face'.

Paradigmatic, syntagmatic and analytic relationships

Read (2004) illustrates that three fundamental associations exist between target words and associates, and they are syntagmatic (collocations), paradigmatic (synonyms, superordinates) and analytic (vocabulary items that represent a vital component regarding the denotation of the target word). An example can be given to illustrate the point.

contract

agreement confident formal notice sign special

(Source: Read, 2004: 221)

The appropriate answers for the above example are 'agreement' (paradigmatic), 'sign' (syntagmatic), and 'formal' (analytic).

Syntagmatic and paradigmatic relations and their differences

Schwartz & Katzir (2012) and Ordóñez, Carlo, Snow, & McLaughlin (2002) opine that contemporary studies on the part of depth of vocabulary have put stress on two facets of depth knowledge; one of them is syntagmatic sense relation, and the other one is paradigmatic sense relationship. Horizontal as well as descriptive perspectives of sematic aspect of words contextually are included under syntagmatic sense relations. In addition, Ordóñez *et al.* (2002) support by saying that it connotes to the process of making definitions regarding connective and

metaphoric notion about them, for example, "a desk is used for studying and reading" or "I read a book on the desk". In contrast, the paradigmatic sense relations is highly interrelated to cognitive capabilities, like classification and cataloguing with super- or sub-ordinate terms (i.e., "a desk is furniture"); thus, it can be mentioned that synonymous words and antonyms of words are building blocks of paradigmatic sense relations (Schwarz, & Katzir, 2012). Verhallen & Schoonen (1988), Schwartz & Katzir (2012) and Ordóñez *et al*. (2002) highlight that several research studies have validated that paradigmatic knowledge of words links up higher degree of cognitive abilities, like academic reading proficiency in greater extent in comparison with syntagmatic sense relations. For example, the study of Schwartz and Katzir (2012) has asserted the reliance on syntagmatic sense relations in the knowledge of vocabulary moves to paradigmatic sense relations when the linguistics abilities of the children strengthen.

According to Schmitt (2000), the other difference between syntagmatic and paradigmatic can be seen, for example paradigmatic relations have more sematic propensity whereas syntagmatic relations include closeness of words in language. Occasionally, paradigmatic pairs can have approximate synonyms (*blossom-flower*) and at times they show different types of sense-relation (e.g. *black-white, table-furniture*).

Morphological knowledge

The study of Kieffer and Lesaux (2008) affirms that morphological awareness alludes to learners' comprehension of the formation of words as composites of purposeful units, which are known as morphemes. It can be evinced at that time when the learner or reader breaks up morphologically compounded words into component morphemes or identifies morphological association between words. They further add that out of morphological activities, extraction of a base word derived from a word which does not participate in sharing its part of speech (for example, *popular* from *popularity*) might have exceptional pertinence for getting access to the meaning of new derived words

that come across at the time of reading. The procedure of morphological interpretation necessitates the incorporation of lexical understanding of specific derivational suffixes and root morphemes accompanied with the metalinguistic capability to identify these units and analyze them. This process, in turn, can have the potentiality to provide learners with gateways or avenues to the meaning of the new words that they come across while reading a text; thus, it may pave the way for enhanced reading comprehension performance.

As reading comprehension is an interactional and progressional procedure of concomitantly formulating and extracting meaning out of text (Snow, 2002), there exist not less than two ways where morphological awareness can be hypothesized to affect the procedure. The two involves word-specific knowledge and a word-general metalinguistic skill. Firstly, the word-specific knowledge included in morphological awareness might expedite the understanding of the texts which involve specific morphologically compound words. This connotes that morphological awareness manifests one facet which is known as depth of vocabulary knowledge (Anderson & Freebody, 1981). As a dimension of knowledge of vocabulary depth, the comprehension of morphological associations might affect reading comprehension without taking breadth of vocabulary into consideration. Secondly, the word-general capability to break down morphologically compounded words might pave the way for more productive word learning (for example, an expansion of breadth of vocabulary) over time; consequently, those words qualify students better to be successful in reading comprehension.

Kieffer and Lesaux (2008) suggest that the difficulties in comprehending reading passage exist among EFLs, and it is evident that morphological awareness might have influence over reading comprehension among native English speakers, so it becomes significant to examine reading comprehension difficulties among EFLs. They reason that lack of morphological awareness would be a significant cause of reading comprehension difficulties for EFLs. Laufer (1997) proposes that learning gets facilitated if

derivational affixes are easily recognizable. For instance, when learners have knowledge of the meaning of *–ful*, it would not be very challenging to identify the meaning of novel words, like *useful* or *careful*, provided that the students know the base forms.

Rationale for not choosing the different dimensions of morphological knowledge

Even though other aspects of morphological properties, such as spelling, pronunciation, parts of speech and register are not negligible parts of depth of vocabulary knowledge (Weixia, 2014), the present study takes one aspect of morphological knowledge (affixes) as an essential part of depth of vocabulary knowledge under its conceptual framework. To the best knowledge of the researcher, lexical researchers recommend that future studies should include spelling, pronunciation, register, etc. as essential parts of depth of vocabulary knowledge. The researcher has not come across any literature so far where spelling, pronunciation, register, frequency, etc. have been studied as parts of depth of vocabulary knowledge with reading comprehension. The understanding of the researcher helps to form this assumption that the L2 lexical research scholars shy away from conducting studies that relate morphological knowledge, such as spelling, pronunciation, register, etc. as parts of depth vocabulary knowledge with reading compression since to structure new instruments (proficiency tests) regarding the said aspects of morphological knowledge of vocabulary depth seems difficult, and the question of the reliability of the tests comes to the fore as well.

Some of the studies which are mentioned in the section (2.2.2) that relates the significance of depth of vocabulary knowledge with academic reading comprehension include several aspects of morphological knowledge with academic reading comprehension, but the scope of those studies fall under the scope of Psycholinguistics, not under Applied Linguistics. The researcher of the present study believes that other scholars in their future studies would examine the relation, prediction or effects of different parts (e.g., spelling, pronunciation, parts of

speech and register) of morphological knowledge as integral parts of depth of vocabulary knowledge and or on reading comprehension as those aspects of morphological knowledge are not negligible (Weixia, 2014).

Vocabulary Depth and L2 Reading Comprehension

In connection with L2 research, Qian (1998, 1999) and Paribakht & Wesche (1999) point out that few empirical studies have been conducted on the association concerning knowledge of vocabulary depth and reading skill. de Bot *et al*. (1997) find out that varying aspects of knowledge of vocabulary, such as morphological aspect and word associations have close relationship with reading comprehension processes. Qian (1999) reveals that knowledge of vocabulary depth has provided a distinctive contribution to the prediction on the reading proficiency of the learners.

Other lexical researchers have also acknowledged the special role of knowledge of vocabulary depth on reading skill. For example, the research conducted by Nation and Snowling (2004) focuses on the predictive role of knowledge of vocabulary depth which is evaluated by an exercise of meaning aspect for the improvement of academic reading success; also the study shows that the predictive role of vocabulary depth has statistically substantial influence on reading comprehension without considering nonverbal activity, non-word reading and phonological capabilities.

The results from L2 vocabulary research have given evidence that a distinct relationship exists concerning knowledge of vocabulary depth and academic reading proficiency. The findings also affirm that vocabulary depth works as an important contributor to success in reading achievement in L2. For example, Qian (2002) makes an assessment of both breadth of vocabulary knowledge and knowledge of vocabulary depth as well as achievement on reading comprehension of 217 adult ESL participants at university level from varied L1 backgrounds. He employs the Depth of Vocabulary Knowledge (DVK) Test, which is

an adaption of Word Associates Test (WAT), and a subtest of a TOEFL reading comprehension in order to measure the variables. The outcomes of Qian's (2002) study substantiate his earlier works (Qian, 1998, 1999). The findings of the study (e.g., Qian, 2002) assert that the knowledge of vocabulary depth as well as academic reading proficiency is notably related. The result of Qian's (2002) other study demonstrates that the marks of knowledge of vocabulary depth can make remarkable contribution to be the powerful predictor of academic reading success. Qian and Schedl (2004) have carried out a study which includes 207 international learners, and the purport of their study is to evaluate the efficacy and pragmatism of the test of knowledge of vocabulary depth. In their research, they have employed three measures, and they are depth measure, Test of English as a Foreign Language (TOEFL) vocabulary measure and TOEFL reading measure. One of the findings of their study reveals that depth measure needs to be incorporated in evaluating TOEFL vocabulary. In addition, this finding is identical with Qian's (1998, 1999, 2002) other studies, and the results of those studies indicate that knowledge of vocabulary depth incomparably exerts more prediction on learners' academic reading success.

A current study conducted by Mehrpour, Razmjoo and Kian (2011) has examined the same issue in a different context which is an EFL context. Their findings show that depth has proved to have greater influence over the academic reading proficiency of the students from a university in Iran than breadth of vocabulary knowledge. In Korean EFL context, Kang *et al.* (2012) have found out that in comparison with breadth of vocabulary knowledge, vocabulary depth has worked as more significant predictor in reading comprehension of the students of Korean high school. The study of de Bot *et al.* (1997) finds out that some parts of knowledge of vocabulary; for example, associations of word, word morphology and other vocabulary depth measures have close relationship with reading comprehension process.

The rationale for academic reading comprehension

The studies (Kezhen, 2015; Chen, 2011; Choi, 2013; Li & Kirby, 2014) that have been mentioned in the section (2.2.2) that deals with the significance of different dimensions of depth of vocabulary knowledge with reading comprehension show the recent development in the literature, and those studies are related with the relationship with depth of vocabulary knowledge and academic reading comprehension, not with general reading comprehension though many other studies have dealt with the association with depth of vocabulary knowledge and general reading comprehension; as a result, the researcher in the present study has taken the recent development of the current literature into consideration, and deals with the association of depth of vocabulary knowledge with academic reading comprehension. Moreover, the L2 vocabulary research scholars take up academic reading comprehension when they deal with the relationship with depth of vocabulary knowledge because to define academic reading comprehension has definitive advantage and clarity among research scholars.

Why the study of different parts of depth of vocabulary knowledge is important?

Vocabulary knowledge in English exerts significant effects on academic reading skill, and students without sufficient knowledge of vocabulary in English are not able to comprehend completely the reading texts in English (Arju, 2011). In other words, the comprehension ability in English of the learners depends on their vocabulary knowledge. The possession of rich knowledge of vocabulary works as an important factor in the pursuit of mastering a Foreign (FL) or Second (L2) language (Horwitz, 1988; Jahan & Jahan, 2011).

Nassaji (2004) indicates that lexical researchers have identified and recognized the multidimensionality and complexity regarding knowledge of words, and they profess that the fairly good knowledge of a word signifies greater knowledge of a word than the knowledge of a word's separate meanings in specific

perspectives. A student should have knowledge of a word that associates various kinds of knowledge, and they range from the knowledge of a words' spelling, pronunciation, stylistic, register and morphological features (Meara, 1996; Haastrup & Henriksen, 2000; Richards, 1976; Nation, 1990, 2001) to the understanding of its syntactic and semantic relations to different new utterances of that speech, and the relationships with other words include the perception of synonymy, antonymy, and hyponymy (Henriksen, 1999; Read, 2000; Chapelle, 1994).

The measures that examine different parts of vocabulary depth knowledge in English make greater and more powerful influence over reading success in comparison with the measures which solely test only one terming of an utterance (Nassaji, 2004). According to Vermer (2001), there is not much investigation conducted by the lexical researchers on the association among different dimensions of the knowledge of vocabulary. The opinion of Milton *et al.* (2008) relates if more new research works on vocabulary are conducted, those would offer manifold insights into the learning and teaching activities from the perspective of comprehending the ways it is fashioned, the ways it is acquired, and the ways it is applied in communicative purpose. The professed idea of Mezynski (1983) and Beck, Perfetti, McKeown (1982) supports the importance of vocabulary depth knowledge within the purview of lexical research. The significant part played by other dimensions of vocabulary depth knowledge on reading comprehension has received little investigation (Qian, 1988). The above mentioned underpinning arguments work as motivation for conducting this research.

Furthermore, there have been several empirical studies which report the correlation between vocabulary depth knowledge and reading comprehension (de Bot, Paribakht & Wesche, 1997; Qian, 1998, 1999, 2002). The recent studies (e.g., Atai & Nikuinezad, 2012; Chen, 2011; Choi, 2013; Farvardin & Koosha, 2011; Kameli, Mustapha & Alyami, 2013; Kezhen, 2015; Li & Kirby, 2014; Mehrpour, Razmjoo & Kian, 2011; Moinzadeh & Moslehpour, 2012; Rashidi & Khosravi, 2010; Rouhi & Negari,

2013) that have dealt the association between reading comprehension and vocabulary depth knowledge have only included paradigmatic relation (synonyms, antonymy, and superordinate under hyponymy), syntagmatic relation (collocations) as a part of vocabulary depth knowledge, but other aspects, like morphological knowledge as a part of vocabulary depth and its association with reading comprehension has not been delved into, particularly under the purview of Applied Linguistics.

Morphological knowledge is an important aspect of vocabulary depth as Li and Kirby (2015) argue that the knowledge of root and affixes can help learners to comprehend the formation of words which in turn develop the learners' understanding of the relationships among words. Also, word parts are very important aspect of vocabulary knowledge (Ma & Lin, 2015). Nagy *et al.* (2006) assert that morphological knowledge plays important role in figuring out how students read and learn novel, long word, and that knowledge influences their reading comprehension.

The assertion of Li and Kirby (2015) is that only as single vocabulary depth measure cannot encompass the whole gamut of the construct; as a result, the examination of a whole assortment of tests that include the entire aspects of vocabulary depth knowledge is needed. For example, the other aspects of vocabulary depth knowledge, like morphsyntactic needs to be delved for getting complete understanding about depth of vocabulary knowledge (Ma & Lin, 2015).

The studies (Deacon & Kirby, 2004; Kieffer & Lesaux, 2008, 2012; Mahony, 1994; Nagy *et al.*, 2006; Tyler & Nagy, 1990) which encompass the association concerning knowledge of morphology and reading skill fall under the scope of Psychology, and some of the studies (Deacon & Kirby, 2004; Tyler & Nagy, 1990) are longitudinal in nature and the participants of those studies include leaners from second to fifth grade (Deacon & Kirby, 2004), students from sixth grade (Kieffer & Lesaux, 2012), learners from fourth to fifth grade (Kieffer & Lesaux, 2008), students from high school and college (Mahony, 1994), learners from fourth to ninth

grade (Nagy *et al.*, 2006), students from tenth to eleven grade (Tyler & Nagy, 1990). None of the above mentioned studies dealt morphological knowledge aspect and its effect on reading comprehension includes participants from tertiary level.

All these mentioned studies that come under the scope of Psychology investigate on native English speaking students, and they did not address the association between morphological knowledge and reading skill among English language learners (Ma & Lin, 2015). Even though Kieffer & Lesaux (2008) conduct a study which investigates the association concerning morphological knowledge and English reading skill among Spanish-speaking students, the students are fourth-to fifth grade English language learners.

Within the scope of Applied Linguistics, according to (Qian, 1998), very few studies have investigated the role of morphological knowledge as a part of vocabulary depth knowledge, and the design of the morphological aspect as vocabulary depth knowledge of those studies concentrate on attached inflections whereas the present study has adopted the morphological aspect as depth of vocabulary knowledge designed by Schmitt & Zimmerman (2002), and focused with the emphasis on derivative forms of the word. The rationale for adopting derivative forms of the words as a part of vocabulary depth is given in the following.

It has already mentioned that vocabulary knowledge is multi-componential, and it includes the knowledge of a words' meaning, spelling, register traits, collocations and morphological and grammatical characteristics (Nation, 2001). There exists interrelationships among the mentioned components, and the interrelationships imply that the acquisition of one component is linked to the acquisition of other components as well (Schmitt, 2000). Derivative word forms connote to the knowledge of the related word forms (Schmitt & Zimmerman, 2002). The knowledge of the derived word forms facilitates the recognition of the other members of the word family (Bauer & Nation, 1993). Reading facilitates particularly derivational knowledge since derivational suffixes can be observed more in the reading texts than in

speaking mode (Chafe & Danielewicz, 1987). Derivational suffixes represent more vocabulary depth knowledge, and the acquisition of L2 derivations has beneficial effect on reading (Schmitt & Zimmerman, 2002); as a result, the present study has included the knowledge of derivational suffixes (i.e., morphological knowledge) as vocabulary depth knowledge for investigating its role on academic reading success.

To the researcher's best knowledge, in terms of the association concerning vocabulary depth knowledge and academic reading success, there is lack of empirical research which makes an attempt to investigate the significant part played by analytic (part-whole) relation as a part of vocabulary depth knowledge on reading skill in any EFL context. Read (2004) illustrates that three fundamental associations, namely syntagmatic relations (collocates), analytic relations (that expresses a crucial component of the connotation of the word referred to) and paradigmatic (which is consisted of synonyms and superordinates) exist between the target words and associates, and also analytic relation is known as important type of sematic relation (Winston, Chaffin, & Hermann, 1987). Schmitt & Meara (1997) also claim the importance of word association knowledge in the field of language learning; consequently, analytic (part-whole) relation can be considered as one of the significant facets of vocabulary depth knowledge.

Recently, those studies (e.g., Atai & Nikuinezad, 2012; Chen, 2011; Choi, 2013; Farvardin & Koosha, 2011; Kameli, Mustapha & Alyami, 2013; Kezhen, 2015; Li & Kirby, 2014; Mehrpour, Razmjoo & Kian, 2011; Moinzadeh & Moslehpour, 2012; Rashidi & Khosravi, 2010; Rouhi & Negari, 2013) which relate the depth of vocabulary aspect has mainly concentrated on the effect of depth of vocabulary knowledge (only includes paradigmatic and syntagmatic relation without analytic relation) on reading comprehension only. There has been lack of empirical investigation which combines the four subcomponents, namely analytic (part-whole) relation with syntagmatic, paradigmatic and morphological knowledge all together as a part of vocabulary

depth knowledge in a single study, and also examines the association among all four constituents of vocabulary depth knowledge and academic reading success; as a result, considering a study along the line mentioned needs to be investigated (Ma & Lin, 2015).

Conceptual Framework

In order to formulate a conceptual framework meant for the present research as well as to discern the relationship concerning knowledge of vocabulary and reading, it seems imperative to do a summing-up of other existing conceptual frameworks regarding knowledge of vocabulary. Cronbach (1942) provides two types regarding knowledge of vocabulary, and the first one is knowledge of word meaning and the second one is accessibility to this knowledge. Richards (1976) has propounded novel traits to this framework, such as register and work frequency. On the other hand, Henriksen (1999) has put forward that knowledge of vocabulary knowledge includes three parts, and the first one is breadth of vocabulary knowledge; the second is knowledge of vocabulary depth and the third aspect includes knowledge of receptive and productive skill.

Afterwards, the framework of Nation (2001) has acknowledged other kinds of vocabulary knowledge, and they are meaning, form and use. Of late, Daller, Milton, and Treffers-Daller (2007) have improved on the framework of Nation (2001), and have proposed three constituents of word knowledge, and they are breadth, depth and fluency. Even though the preceding frameworks are contrasting, and have contributed different kinds of vocabulary knowledge, they complement each other as well.

In addition, other lexical researchers (Qian, 1998, 1999, 2002; Qian and Schedl, 2004; Read, 1989, 2000; Wesche & Paribakht, 1996) have constructed conceptual frameworks which categorically reflect the distinction between knowledge of vocabulary depth and knowledge of vocabulary breadth. The said frameworks manifest the collective strength of the earlier frameworks. More particularly, the conceptual frameworks of Qian

are based on the frameworks proposed by Nation (2001) and Richards (1976). Nation's (2001) and Richards' (1976) frameworks have determined different main building blocks which comprise knowledge of vocabulary depth for academic reading proficiency. L2 lexical researchers have focused on knowledge of vocabulary breadth and knowledge of vocabulary depth. They also have dealt with both aspects of knowledge of vocabulary in terms of academic reading success, but the present study only considers different parts of knowledge of vocabulary depth, not the breadth, regarding reading comprehension as conceptual framework, which is based on Qian's research. For the present study, the conceptual framework of knowledge of vocabulary depth in terms of reading comprehension is predominantly based on Qian's (1998, 1999, 2002) and Qian and Schedl's (2004) study. On the basis of the literature review and the theoretical gaps identified in vocabulary knowledge research, the Figure 1 of the conceptual framework for the current research is given below.

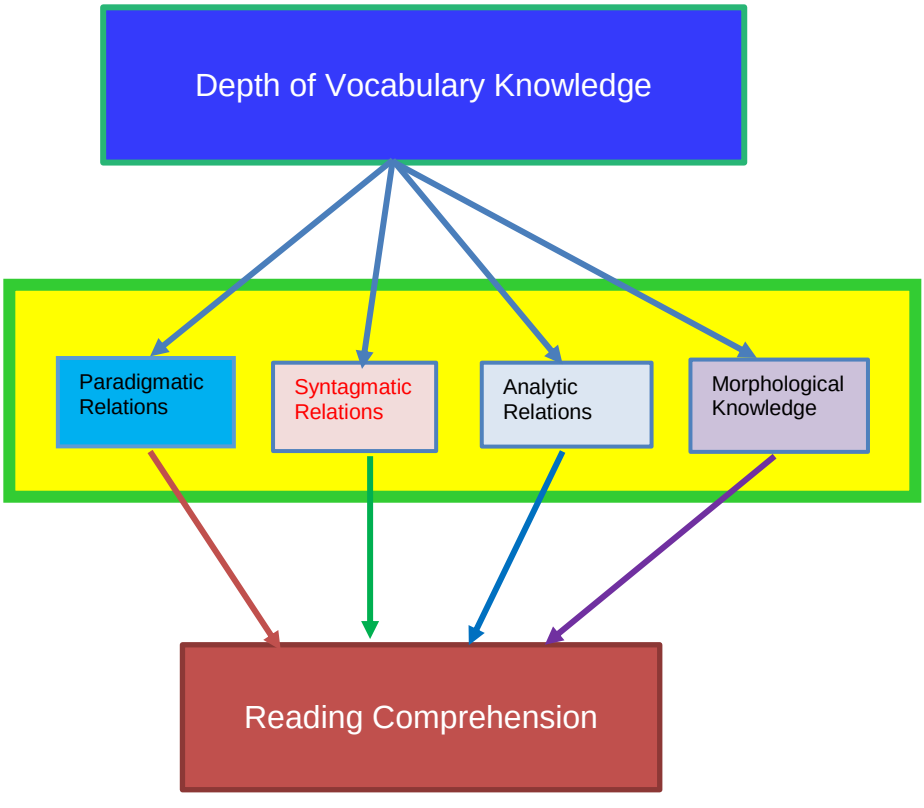


Figure 1*:* Proposed conceptual framework for the present study

The proposed conceptual framework represents different parts of knowledge of vocabulary depth, namely paradigmatic relations, syntagmatic relations, analytic relations and morphological relations, and how these multifarious aspects correlate with reading comprehension. The different parts of knowledge of vocabulary depth have been treated as independent variables whereas the reading comprehension has been considered as dependent variable.

Implications of the Study

This implication of the present study concerns that the study would give insights which will work as suitable guidelines for curriculum designers and material developers. The teachers as well will be able to find out the required depth of vocabulary knowledge of the students in English, and they will be able to design their syllabus accordingly. The depth of vocabulary knowledge in L2/FL (English), which includes collocation, meaning and morphological aspects under the present conceptual framework is investigated as in this study; consequently, the teachers could be able to figure out how difficult the would-be-taught list of vocabulary be to the students. The English language teachers could be able to generate awareness of the significance of vocabulary knowledge among students, and this in turn will improve the learning of English language skills.

Further implication of the study concerns that the current research would suggest that the depth of vocabulary knowledge test could have practical use for the students as well as for the teachers in English. The knowledge of the depth of vocabulary and its test could have further implications for lexical researchers as well. The application of the current research can suggest that the act of measuring students' vocabulary depth would allow English teachers to prioritize setting language goals of the courses under communicative language teaching.

As the present study concerns the vocabulary depth knowledge of L2 (English), the said research would allow the teachers to teach various dimensions of vocabulary depth

knowledge. Thus, it would help students to enrich their overall performance in English. The students would be able to grasp the significance of performing actual language use to develop their abilities when they encounter with the different dimensions of vocabulary depth knowledge.

Conclusion

This paper provides the notion of different dimensions of depth of vocabulary knowledge, and that notion is supported by the evidence from literature; thus, it is more of theoretical in nature. Hence, it would be more meaningful if future researches take up the presented conceptual framework and test empirically the relationship of different parts of depth of vocabulary knowledge and their relationship with reading comprehension. Then, a clear and robust picture of the provided framework can be found and issues related to depth of vocabulary knowledge and academic reading comprehension will be evident among researchers.

The present research article explores the important role of different parts of depth of vocabulary knowledge with academic reading comprehension and their relationships and prediction on academic reading comprehension. The findings of the recent studies that deal with the depth of vocabulary knowledge and academic reading comprehension have been synthesized and justified to show that analytic (meronymy) and morphological knowledge need to be integrated as integral parts of depth of vocabulary knowledge along with paradigmatic relations and syntagmatic relations as parts of depth of vocabulary knowledge with academic reading comprehension. The theoretical gap of the present study is that lexical researchers have so far studied about paradigmatic relations and syntagmatic relations, not analytic relations and morphological knowledge combined as parts of depth of vocabulary knowledge with academic reading comprehension. To the best knowledge of the researcher, there is lack of empirical research that deals with the combination of different parts of depth of vocabulary knowledge and examines the

said parts of depth of vocabulary knowledge, namely paradigmatic relations (synonyms, hyponymy, antonymy), syntagmatic relations (collocation), analytic relation (meronymy) and morphological knowledge (affixes) together on academic reading comprehension in English in any context; thus, the testing of the proposed conceptual framework by future lexical researchers will contribute to the body of knowledge to the issues related to the depth of vocabulary knowledge and academic reading comprehension.

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