



Please cite this paper as follows:

Hasan, M. K., & Shehzad, M. W. (2020). Correlation and prediction of syntagmatic and paradigmatic relations to academic reading comprehension among tertiary level EFL learners. *Journal of Research in Applied Linguistics*, 11(2), 70-80. <https://doi.org/10.22055/RALS.2020.15947>

Research Paper

Correlation and Prediction of Syntagmatic and Paradigmatic Relations to Academic Reading Comprehension Among Tertiary Level EFL Learners

Md. Kamrul Hasan & Muhammad Waleed Shehzad

¹Corresponding author, English Language Institute, United International University, Dhaka, Bangladesh; mkamrulhasan77@gmail.com

²Department of English, Foundation University Islamabad (FUI), Islamabad, Pakistan; waleed.shehzad@fui.edu.pk

Received: 28/04/2020

Accepted: 30/09/2020

Abstract

An in-depth investigation of vocabulary depth knowledge by lexical researchers plays an important role in language teaching and learning. However, little is known of empirical research related to the correlation and prediction of syntagmatic and paradigmatic relations, which represent vocabulary depth knowledge to reading comprehension in an EFL context like Bangladesh. Therefore, this study examined the correlation and prediction of syntagmatic and paradigmatic relations to academic reading comprehension, employing standard multiple regression analysis under a quantitative approach amongst 175 Bangladeshi undergraduate EFL students. The results of this study showed that a significant and strong correlation existed between paradigmatic relations and reading comprehension. In addition, paradigmatic relations made a statistically more significant unique prediction to reading comprehension than syntagmatic relations, and it had a larger effect on reading comprehension than syntagmatic relations. Providing an insight into the research gap, the present study suggests that paradigmatic and syntagmatic relations' knowledge of vocabulary depth knowledge would have practical use for EFL students, English teachers at the tertiary level, and further implications for lexical researchers.

Keywords: Paradigmatic vs. Syntagmatic Relations; Correlation; Prediction; Academic Reading Comprehension

1. Introduction

The vocabulary dimension of language learning and teaching has achieved special prominence, and it has been comprehensively researched in SLA, instruction, and assessment (Schmitt, 2010; Zhang & Yang, 2016). The important role of vocabulary knowledge in an L2 has been described in detail (Choi & Zhang, 2018; Nation, 1983; Schmitt, 2008; Zhang, Lin, Zhang, & Choi, 2017). A close association is found between reading comprehension and vocabulary (Nation, 2001; Qian, 1999, 2002) or the ability to read well (Read, 2000, p. 74). The knowledge of vocabulary assists the ensuing in-depth reading comprehension (Choi & Zhang, 2018).

Moreover, L2 vocabulary researchers (e.g., Bogaards & Laufer, 2004; Chapelle, 1998; Li & Kirby, 2015; Nation, 1990, 2001; Qian, 1998, 1999, 2002; Read, 1989, 1993, 1998, 2000; Zhang, 2012; Zhang & Koda, 2017) consider vocabulary knowledge as multidimensional. According to Qian (1999), Read (1989), and Wesche and Paribakht (1996), knowledge of vocabulary comprises, at least, two components: the size or breadth of vocabulary and the depth or quality of vocabulary knowledge. Vocabulary depth knowledge (i.e., how deeply or well a word is known) encompasses varied components, such as pronunciation, spelling, frequency, meaning, register, and syntactic/morphological traits (Chapelle, 1994; Henriksen, 1999; Nation, 1990; Qian, 1998, 1999; Read, 2004).

Vocabulary researchers have primarily stressed on the important role played by vocabulary size or breadth in reading comprehension (i.e., Jeon & Yamashita, 2014; Laufer, 1992, 1996; Milton, 2013; Na & Nation, 1985). Qian (2002) asserts that both depth and breadth aspects need to be investigated with equal attention concerning their important roles in reading comprehension. Consequently, the measures that are responsible for assessing vocabulary depth



knowledge constructively are essentially sought after because L2 vocabulary knowledge related studies have shown “a clear imbalance” (Zhang & Yang, 2016, p. 699) concerning its multitudinous nature, especially with regard to vocabulary depth knowledge.

According to Zhang and Koda (2017), a paradigmatic relation is “an associate of the same word class as the stimulus word (i.e., free association) and performing the same grammatical function in a sentence” (p. 2), such as a synonym (i.e., *sudden*, *quick*, and *surprising*). On the other hand, a syntagmatic relation refers to “an associate of a different word class from the stimulus word and having a sequential relationship with the stimulus word” (p. 2), such as a collocate (i.e., *sudden change* or *sudden noise*). Concerning the relationship between reading comprehension and vocabulary depth knowledge, a review of the literature shows that researchers (i.e., Atai & Nikuinezhad, 2012; Choi, 2013; Chen, 2011; Li & Kirby, 2015; Kezen, 2015; Moinezhad & Moslepour, 2012; Mehrpour, Razmjoo, & Kian, 2011; Rashidi & Khosravi, 2010) have focused on paradigmatic relations (synonyms, antonyms, and superordinate under hyponymy) and syntagmatic relations (collocations) as aspects of vocabulary depth knowledge and their correlations and prediction to reading comprehension. The present study was based on Bangladeshi EFL learners. So from the Bangladeshi perspective, a similar study can provide a different result as the context or background of Bangladesh is different from the abovementioned previous studies.

On the contrary, in the context of Bangladesh, vocabulary related studies have mainly focused on the challenges that EFL teachers face, whereas they teach vocabulary and the students learn vocabulary in EFL classrooms (Jahan & Jahan, 2011; Siddiqua, 2016), vocabulary learning strategies (Ashraf, 2015), prevalent vocabulary teaching practice (Hasan, 2014), vocabulary and English writing skill (Afrin, 2016), and the effect of preschool dialogic reading on expressive vocabulary (Opel, Ameer, & Aboud, 2009).

However, in the context of Bangladesh, the abovementioned studies have not focused on syntagmatic and paradigmatic relations, which represent vocabulary depth knowledge, and their correlation and prediction to academic reading comprehension of EFL Bangladeshi tertiary-level students. Thus, filling the research gap, the current study was an attempt to examine syntagmatic and paradigmatic relations of vocabulary depth knowledge and their correlations and prediction to academic reading comprehension. Thus, more importantly, an investigation of syntagmatic and paradigmatic relations aspects of vocabulary depth knowledge of Bangladeshi EFL students at the tertiary level becomes very significant because such an investigation would determine their lack of the specific aspect of vocabulary depth knowledge. In addition, an identification of the specific aspect of vocabulary knowledge and the focus on learning of that specific aspect by the students would help enhance their academic success.

2. Literature Review

2.1. Theory Relating to Vocabulary Comprehension

L2 researchers and teachers are perplexed by the way of determining the exact nature of vocabulary knowledge (Schmitt, 2014); furthermore, the nature of vocabulary knowledge is not clearly identified and defined (Li & Kirby, 2015). Moreover, many overlapping ways show their existence and the depth of vocabulary knowledge can be conceptualized in those ways (Schmitt, 2014). Consequently, the difference in conceptualizing vocabulary depth knowledge makes it unfathomable to comprehend the ways to approach depth “from a theoretical perspective” (Schmitt, 2014, p. 915). In addition, the lack of definition manifests that the definition is “clearly theory-driven” (Li & Kirby, 2015, p. 614). Thus, this research deliberates on the prevalent, important, and relevant hypothesis (instrumental) and approach (dimension) regarding vocabulary and reading comprehension for the current study, and more of the hypothesis and approach are discussed in the Results and Discussion section.

2.2. Prevalent Research Studies on Vocabulary Depth Knowledge

A review of relevant literature shows inconclusive results regarding the correlation and prediction of syntagmatic and paradigmatic relations to academic reading comprehension. Studies (Atai & Nikuinezhad, 2012; Choi, 2013; Kang, Kang, & Park, 2012; Kezen, 2015; Mehrpour, Razmjoo, & Kian, 2011; Rashidi & Khosravi, 2010) found that syntagmatic and paradigmatic relations of vocabulary depth knowledge were stronger predictors of reading comprehension. In addition, they were also closely associated with reading comprehension and had a greater impact on reading comprehension. On the other hand, other research works (Chen, 2011; Li & Kirby, 2015; Moinezhad &

Moslehpour, 2012) showed that paradigmatic and syntagmatic relations of vocabulary depth knowledge were not stronger predictors of reading comprehension. Furthermore, they were also not closely associated with reading comprehension and had no greater impact on reading comprehension. Accordingly, an investigation of correlations and prediction of syntagmatic and paradigmatic relations, which represent vocabulary depth knowledge, to academic reading comprehension is needed in order to have a comprehensive picture of the correlations and prediction of syntagmatic and paradigmatic relations to academic reading comprehension. In addition, such an investigation is needed to contribute to reducing the research gap, which was one of the objectives of the current research work. To address the research gap based on the above literature, the following research questions were formulated:

1. How are syntagmatic and paradigmatic relations, which represent vocabulary depth knowledge test, are correlated to academic reading comprehension?
2. To what extent do syntagmatic and paradigmatic relations, which represent the depth of vocabulary knowledge test, contribute to predicting the performance of EFL learners' academic reading comprehension?
3. Which constituent of the depth of vocabulary knowledge test (i.e., syntagmatic and paradigmatic relations) is the most contributing predictor of academic reading comprehension?
4. To what level do syntagmatic and paradigmatic relations, which represent the depth of vocabulary knowledge test, affect EFL learners' academic reading comprehension?

3. Methodology

3.1. Research Design

The current study followed multiple regression analysis of the correlation design under the quantitative approach to describe potential correlations and predictions among the variables (Creswell, 2014). In addition, explanatory research design and the prediction design under correlation design were employed for analyzing the data.

3.2. Population of the Study, the Sample Design, and Sample Size

For the current study, the total number of students who were pursuing English courses under Business and Engineering Schools in a private university in Bangladesh in Spring trimester 2018 was 3,640. In order to achieve the purpose of the study, purposive sampling in the first place and random sampling as the second step were employed. Out of the total number of the whole population, the extracted participants/sample size were a sample of 175 Bangladeshi EFL students in the first year of their bachelor's degree from a mid-level private university in Bangladesh.

A total of 111 participants from four sections of the Business School, namely Bachelor of Business Administration in Finance or in other majors ($n = 36$) and Bachelor of Science in Economics ($n = 45$) and Bachelor of Business Administration in Accounting ($n = 30$) participated in the present study. Out of them, 79 were female (45.1.0%) and 96 were male (54.9%), with an average age of about 20.33 ($SD = 1.161$, range 18-24). Moreover, a total of 64 students, studying engineering participated in the study. Out of them, 20 were female (31.3%) and 44 were male (68.8%), with an average age of about 20.16 ($SD = 1.027$, range 18-23). One section consisted of 31 students who were from Bachelor of Science in Electrical and Electronic Engineering School, and the other section comprised 33 students who were from the Department of Computer Science and Engineering (Hasan & Shabdin, 2017). All the participants were selected based on their passing Basic English Skill (Credit Course 1) course, which was approximately at A2-B1 level of the Common European Framework of Reference.

3.3. Instruments

The participants completed one vocabulary instrument, namely a depth of vocabulary knowledge test, which was represented by syntagmatic and paradigmatic relations and a reading comprehension test that consisted of three reading passages followed by multiple-choice questions.

3.3.1. Vocabulary depth knowledge test

Version 4 of the Words Associates Test and depth of vocabulary knowledge test (Qian & Schedl, 2004) were adapted and employed to assess the vocabulary depth knowledge of the participants. The depth of the vocabulary

knowledge test which was represented by syntagmatic and paradigmatic relations comprised 40 items. For both paradigmatic (synonyms) and syntagmatic (collocation) relations, each item incorporated one adjective target or headword and eight response words, which were divided into two separate columns. Under each item (i.e., target word), there were eight options, and each item had two groups with an equal number of associates and distractors. In other words, the left-hand side, that is, one group was for checking the understanding of paradigmatic relations and the right-hand side group, that is, another group was for checking the understanding of syntagmatic relations of the target words (Hasan & Shabdin, 2017). In terms of scoring the vocabulary depth knowledge test, each word appropriately chosen weighed 1 point. An incorrect selection of the answer was given 0; as a result, the maximum achievable score of the vocabulary depth knowledge test was $4 \times 40 = 160$. The total number of paradigmatic items was 79, whereas the total number of syntagmatic items was 81. One example is given in the following to show how to answer a depth of vocabulary knowledge test:

(A) ungrateful (B) inexpressible (C) lack (D) inadequate	(E) discontented (F) resources (G) amount (H) need
--	--

3.3.2. Reading comprehension test

The reading comprehension test was a standard multiple-choice academic reading comprehension test, and this reading comprehension test was adopted from *Longman Test of English as a Foreign Language* (TOEFL; Phillips, 2006, pp. 343-345). The present study adopted three passages of the TOEFL reading comprehension test because the focus of the study was on examining the correlation and prediction of vocabulary depth knowledge to academic text comprehension. The adopted TOEFL reading comprehension test comprised 9 questions out of the 20 questions (i.e., question # 1 from text # 1; questions # 3, 4, 7, and 8 from text # 2 two, and questions # 14, 16, 17, and 18 from text # 3) that aimed to measure the syntagmatic and paradigmatic relations, which represented vocabulary depth knowledge (Hasan & Shabdin, 2017). The total number of the multiple-choice questions was 20, so the maximum possible score for the test was 20.

3.4. Measuring Reliability of the Measure

3.4.1. Pilot study

In order to check the internal reliability/consistency of the items employed to measure the constructs of the instrument, a reliability analysis by *KR-21* formula was administered for conducting the pilot study. *KR-20* is used to measure the reliability of a test, which consists of right or wrong answers, and it is designed to investigate how well a test measures that a researcher intends to measure (Alderson, Clapham, & Wall, 1995). The reliability of *KR-20* showcases correspondence or similarity to Cronbach's alpha. Table 1 demonstrates the performance of the learners ($n = 20$) on the two language tests and the reliability of the tests ($n =$ number of items) of the pilot study (Hasan & Shabdin, 2017):

Table 1. Means, Standard Deviations, and Reliability Coefficients Value

Tests	n^*	Range	Minimum	Maximum	Mean	Std. Deviation	<i>KR</i> Coefficients	Reliability	MPS**
DVK ¹	40	22.00	137.00	159.00	147.80	6.677	0.750		160
RC ⁴	20	10.00	8.00	18.00	12.85	3.281	0.630		20

**MPS= maximum possible score * n = number of items

DVK¹ = Depth of Vocabulary Knowledge Test; RC⁴ = Reading Comprehension

The r values (reliability coefficients) of the two tests (i.e., vocabulary depth knowledge test and reading comprehension test) were moderate and can be considered to have an acceptable level of reliability because the number of items ($n = 20$) was small. Importantly, the acceptable *KR-21* score is dependent on the type of conducted test. Generally, a score that is above 0.50 is regarded as reasonable. According to Salvucci, Walter, Conley, Fink, and Saba (1997), in terms of the range of reliability measure, when the r value is less than 0.50, the reliability is considered low; if the r value is between 0.50 and 0.80, the reliability is regarded as moderate whereas the r value is greater than 0.80, the reliability is treated as high. Even though *KR-21* employs less information to compute, it always provides a lower reliability index than produced by other methods (Alderson et al., 1995). In conclusion, it can be said that all the items incorporated in the two instruments showed an acceptable level of internal consistency while assessing their respective intended measures. Moreover, the two tests were reliable and valid.

4. Results

4.1. Correlations Among Paradigmatic, Syntagmatic Relations, and Academic Reading Comprehension

Research question # 1 reads: “How are syntagmatic and paradigmatic relations, which represent vocabulary depth knowledge test, are correlated to academic reading comprehension?” To answer this question (i.e., regarding the strength and direction of the correlations of syntagmatic and paradigmatic relations that represented vocabulary depth knowledge and academic reading comprehension), a two-tailed Pearson correlation was conducted and the results are presented in Table 2:

Table 2. *Correlations Among Paradigmatic Relations, Syntagmatic Relations, and Academic Reading Comprehension*

	Paradigmatic (Synonyms)	Syntagmatic (Collocations)
Syntagmatic (Collocations)	Pearson Correlation	.535**
	Sig. (2-tailed)	.000
Reading Comprehension	Pearson Correlation	.431**
	Sig. (2-tailed)	.001

**Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows that there was a significant positive correlation at the 0.01 level ($r = .431$; $p < .01$) between academic reading comprehension and paradigmatic (synonymous words) relation, which represented the vocabulary depth knowledge test. This suggests that the students who had learnt paradigmatic (synonyms) relations performed better in academic reading comprehension than those who had learnt syntagmatic relations (collocations), which had a positive and significant relationship at the 0.01 level ($r = .359$; $p < .01$) with reading comprehension. In addition, this suggests that the students who had learnt both paradigmatic (synonyms) and syntagmatic (collocations) relations, which represented vocabulary depth knowledge (test), performed better in academic reading comprehension. In other words, two aspects of vocabulary depth knowledge helped the learners perform better in academic reading comprehension. On the other hand, as shown in Table 2, the correlation at the 0.01 level ($r = .535$; $p = .000$) between paradigmatic and syntagmatic relations of vocabulary depth knowledge test was found positive and statistically significant. Moreover, this suggests that the two aspects (i.e., syntagmatic and paradigmatic relations) are interconnected and they necessarily form as essential components of vocabulary depth knowledge.

4.2 Paradigmatic and Syntagmatic Relations as Predictors of Academic Reading Comprehension

Research question # 2 addresses the contribution of syntagmatic and paradigmatic relations, which represent the depth of vocabulary knowledge test, to predicting the performance of the EFL learners' academic reading comprehension and research question # 3 relates to the most contributing predictor of academic reading comprehension of the two syntagmatic and paradigmatic relations. Research questions # 2 and 3 were developed to determine the most significant, unique predictor of academic reading comprehension and to address the extent of prediction of syntagmatic and paradigmatic relations, which represented vocabulary depth knowledge on academic reading comprehension.

The results of the regression analysis which appear in Tables 3 and 4 show the prediction value, ANOVA, and coefficient values of two independent variables (i.e., both paradigmatic and syntagmatic relations, which represented vocabulary depth knowledge test) on the dependent variable, academic reading comprehension in terms of scores of students of Business and Engineering Schools:

Table 3. *Prediction and ANOVA Values of Paradigmatic and Syntagmatic Relations of All Students' Score*

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. Error of the Estimate	ANOVA				
				Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
.353	.125	.112	3.114	197.402	2	98.701	10.180	.000

a. Dependent Variable: Reading Comprehension; B. Predictors: (Constant), Syntagmatic and Paradigmatic Relations

Table 4. *Correlations Values Under Coefficients of Paradigmatic and Syntagmatic Relations of Students of Business and Engineering*

	Coefficients				
	Correlations		Sig.	Collinearity Statistics	
	Partial	Part		Tolerance	VIF
DVK ¹ Synonyms (Paradigmatic)	.237	.229	.004	.802	1.247
DVK Collocations (Syntagmatic)	.147	.139	.077	.802	1.247

a. Dependent Variable: Reading Comprehension; ¹Depth of Vocabulary Knowledge Test

Because the F statistics was found in the ANOVA table to be significant at the 0.001 level ($R^2 = .125$), $F(2, 143) = 10.180$, $p = .000$, the run regression model was found to be well fitted for the data. As Table 4 shows, paradigmatic (synonyms) relations that represented vocabulary depth knowledge test uniquely explained about $(.229)^2 = 5.24\%$ of the variance in reading comprehension; syntagmatic (collocations) relations that represented the depth of vocabulary knowledge alone explained $(.139)^2 = 1.93\%$ of the variance in academic reading comprehension. The above discussion above shows that the higher unique prediction was explained in academic reading comprehension by paradigmatic (synonyms) relation of vocabulary depth knowledge (5.24%) than the syntagmatic relation aspect of the depth of vocabulary knowledge test.

4.3. *Effects of Syntagmatic and Paradigmatic Facets, Which Represented Vocabulary Depth Knowledge, on Academic Reading Comprehension*

Research question # 4 reads: "To what level do syntagmatic and paradigmatic relations, which represent depth of vocabulary knowledge test, affect EFL learners' academic reading comprehension?" This question was developed to find out the largest, larger, or the least effect of syntagmatic and paradigmatic relations, which represented the depth of vocabulary knowledge, on academic reading comprehension.

Table 5 puts forward the effects of both syntagmatic and paradigmatic relations that represented the depth of vocabulary knowledge test on academic reading comprehension. The results of the regression analysis, which appear in Table 5 show Beta prediction value under coefficients of two components (i.e., syntagmatic relations and paradigmatic relations of vocabulary depth knowledge test) as the predictors (word meaning set of depth of vocabulary knowledge test and word collocation set of depth of vocabulary knowledge test) of the dependent variable (i.e., academic reading comprehension) in terms of the scores of the students of Business and Engineering Schools:

Table 5. *Coefficients of Paradigmatic and Syntagmatic Relations Variables on Academic Reading Comprehension*

IV ¹	Standardized Coefficients		t	Sig.
	β			
DVK ^A Synonyms	.255		2.922	.004
DVK Collocations	.155		1.778	.077

a. Dependent Variable: Reading Comprehension; IV¹ = Independent Variable, ^ADepth of Vocabulary Knowledge Test, represented by Syntagmatic and Paradigmatic Relations

As showcased in Table 5, the Beta value of word meaning (paradigmatic) set of the depth of vocabulary knowledge test ($\beta = .255$; $t = 2.922$, $p = .004$ [significant; $p < .001$]) indicates that the paradigmatic relations of depth of vocabulary knowledge test made larger effect on the outcome variable, academic reading comprehension than the syntagmatic aspect of the depth of vocabulary knowledge test ($\beta = .155$, $t = 1.778$, $p = .077$ [significant at the 0.10 level; $p < .10$]) when the variance was explained by the syntagmatic relations of depth of vocabulary knowledge test jointly.

5. Discussion

As shown in Table 2, the positive, significant correlation at the level of 0.01 ($r = .445$; $p = .000$) between paradigmatic and syntagmatic relations, which represented vocabulary depth knowledge test, signifies that the two aspects

were interconnected and they formed an essential part under the same construct, vocabulary depth knowledge. This finding corroborates the findings of the studies conducted by Qian (1998, 1999). In addition, paradigmatic relations (i.e., word meaning set of vocabulary depth knowledge) of vocabulary depth knowledge had a stronger, significant, and positive correlation ($r = .324$; $p = .000$) with academic reading comprehension than the correlation between syntagmatic (collocations, i.e., word collocation set of vocabulary depth knowledge) relations of vocabulary depth knowledge and academic reading comprehension ($r = .269$; $p = .001$). Similarly, this finding is also congruent with the finding of the studies of Qian (1998, 1999).

As shown in Table 4, the unique variance explained by the word meaning set of vocabulary depth knowledge (paradigmatic relation) indicates that the paradigmatic relation of depth of vocabulary knowledge test was a stronger unique predictor of reading comprehension than the word collocation set of the depth of vocabulary knowledge test (syntagmatic relation). This finding corroborates the results regarding the word meaning set and the word collocation set of the depth of vocabulary knowledge test found in Qian (1998, 1999) even though the two aspects in his study shared common properties. On the other hand, Kezen (2015) found that the collocation part of the depth of vocabulary knowledge played an important role in the prediction of the scores in reading comprehension skill.

The results of the present study showed that the paradigmatic relation of the depth of vocabulary knowledge test made a larger effect than the syntagmatic relation of the depth of vocabulary knowledge test on academic reading comprehension. Moreover, the results, to some extent, are not congruent with the findings of Qian (1998, 1999) because Qian's (1998, 1999) studies revealed that both syntagmatic and paradigmatic relations of vocabulary depth knowledge were found to have similar levels of predicting powers. If the sample size of the study by Qian (1998, 1999) had been increased, the result would have been different. On the other hand, several studies (i.e., Alderson, 1993, 2000; Atai & Nikuinezhad, 2002; Cain, 2007; Paribakht, 2004; Shiotsu & Weir, 2007; van Gelderen, Schoonen, de Gloppe, Hulstijn, Simis, Snellings, & Stevenson, 2004) found that a significant association existed between syntactic knowledge and reading comprehension and syntactic knowledge had the significant mediating effect on reading comprehension. The mentioned studies showed that the higher unique prediction was explained in academic reading comprehension by syntactic knowledge, as well. The sample of the abovementioned studies was taken from EFL backgrounds; as a result, the results showed similarity with the present study. Moreover, the sample of the current study was from an EFL background, as well.

The results of the current study showed that for the EFL learners, two dimensions of the depth of vocabulary knowledge played a significant role in performing in academic reading comprehension, and evidence in support of the dimension approach is affirmed because a dimensional approach contends that depth of vocabulary knowledge encompasses different aspects of word knowledge. On the contrary, the results of the current study substantiate the instrumental hypothesis which indicates knowledge of a word's meaning directly affects the reading comprehension of a learner. This statement is supported by the obtained significant and positive correlations between academic reading comprehension and two dimensions of vocabulary depth knowledge, and the students' knowledge of two dimensions of vocabulary depth knowledge directed affected their performance in academic reading comprehension.

6. Conclusion and Suggestions

The current study showcased that paradigmatic (synonyms/meaning) relation, which represented the vocabulary depth knowledge test, was found to have a stronger, positive, and significant correlation with academic reading comprehension than the correlation between syntagmatic relation and academic reading comprehension. In addition, the higher unique prediction was explained in academic reading comprehension by paradigmatic relations than syntagmatic relations. Moreover, paradigmatic relations had a larger effect on explaining academic reading comprehension than syntagmatic relations.

In terms of implications, because the current study corroborates the significance of two components of vocabulary depth knowledge test and their correlations with reading comprehension, the findings of the current research will have meaningful implications for future researchers to work on EFL reading comprehension and vocabulary knowledge, curriculum/syllabus designers, and instructional practices for EFL classrooms. Concerning the strengths of the study, because the two tests underwent a pilot study and indicted an acceptable level of reliability, the administered

instruments can be replicated in other EFL contexts, as well. In addition, the current study contributes to reducing the research gap, investigating two aspects of vocabulary depth knowledge and their correction with reading comprehension.

Regarding the limitations of the present research, because the present study investigated primarily the associations between two dimensions of vocabulary depth knowledge and academic reading comprehension, any impact of L1 (i.e., Bengali) or background knowledge of the participants on the test results was not explored. In addition, purposive sampling (nonrandom sampling) was employed as one of the research methods, so the obtained results might not be generalizable to other educational institutions.

In the context of recommendations, the participants in this study were from only one university, so L2 learners from different levels of educational sectors would make this study more comprehensive. Future researchers can attempt to find out whether and how dissimilar facets of vocabulary depth knowledge would correlate with other language skills (i.e., listening, writing, and speaking). Moreover, the potential of direction and strength of correlations of the depth of vocabulary knowledge to other language skills would be known to academia.

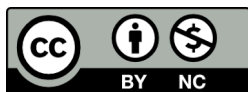
References

- Afrin, S. (2016). Writing problems of non-English major undergraduate students in Bangladesh: An observation. *Open Journal of Social Sciences*, 4(3), 104-115.
- Alderson, J. C. (1993). The relationship between grammar and reading in an English for academic purposes test battery. In D. Douglas & C. Chapelle (Eds.), *A new decade of language testing research: Selected papers from the 1990 Language Testing Research Colloquium* (pp. 203-219). Alexandria, VA: Teachers of English to Speakers of Other Languages.
- Alderson, J. C., Clapham, C., & Wall, D. (1995). *Language test construction and evaluation*. New York: Cambridge University Press.
- Alderson, J. C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.
- Ashraf, T. A. (2015). Teaching vocabulary to non-English majors: A general perspective. *DIU Journal of Humanities and Social Science*, 2, 167-175.
- Atai, M. R., & Nikuinezhad, F. (2012). Vocabulary breadth, depth, and syntactic knowledge: Which one is a stronger predictor of foreign language reading performance? *Iranian Journal of Applied Linguistics*, 15(1), 1-18.
- Bogaards, P., & Laufer, B. (2004). *Vocabulary in a second language*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Chapelle, C.A. (1994). Are C-tests valid measures for L2 vocabulary research? *Second Language Research*, 10(2), 157-187.
- Chapelle, C. A. (1998). Construct definition and validity inquiry in SLA research. In L. F. Bachman & A. D. Cohen (Eds.), *Interfaces between second language acquisition and language testing research* (pp. 32-70). Cambridge: Cambridge University Press.
- Cain, K. (2007). Syntactic awareness and reading ability: Is there any evidence for a special relationship? *Applied Psycholinguistics*, 28(4), 679-694.
- Chen, K. Y. (2011). The impact of EFL students' vocabulary breadth of knowledge on literal reading comprehension. *Asian EFL Journal*, 51, 30-40.
- Choi, H. Y. (2013). Effects of depth and breadth of vocabulary knowledge on English reading comprehension among Korean high school students. *Language Research*, 49(2), 419-452.
- Choi, Y., & Zhang, D. (2018). The relative role of vocabulary and grammatical knowledge in L2 reading comprehension: A systematic review of literature. *International Review of Applied Linguistics in Language Teaching*. <https://doi.org/10.1515/iral-2017-0033>

- Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Essex, England: Pearson Education Limited.
- Hasan, N. (2014). Teaching vocabulary through collaboration: Students as independent readers. *Journal of Education and Practice*, 5(13), 60-68.
- Hasan, M. K., & Shabdin, A. A. (2017). The correlation and contribution of depth of vocabulary knowledge to reading success of EFL Bangladeshi tertiary students. *PASAA*, 53, 148-181.
- Henriksen, B. (1999). Three dimensions of vocabulary development. *Studies in Second Language Acquisition*, 21(2), 303-317.
- Jahan, A., & Jahan, N. (2011). Working with vocabulary at tertiary level in Bangladesh. *Journal of Education and Practice*, 2(5), 45-57.
- Jeon, E. H., & Yamashita, J. (2014). L2 reading comprehension and its correlate: A meta-analysis. *Language Learning*, 64(1), 160-212.
- Kang, Y., Kang, H. S., & Park, J. (2012). Is it vocabulary breadth or depth that better predict Korean EFL learners' reading comprehension? *English Teaching*, 67(4), 149-171.
- Kezhen, L. I. (2015). A study of vocabulary knowledge and reading comprehension on EFL Chinese learners. *Studies in Literature and Language*, 10(1), 33-40.
- Laufer, B. (1992). How much lexis is necessary for reading comprehension? In P. J. L. Arnaud & H. Béjoint (Eds.), *Vocabulary and applied linguistics* (pp. 126-132). London: MacMillan.
- Laufer, B. (1996). The lexical threshold of second language reading comprehension: What it is and how it relates to L1 reading ability. In K. Sajavaara & C. Fairweather (Eds.), *Approaches to second language acquisition* (pp. 55-62). Jyväskylä: University of Jyväskylä.
- Li, M., & Kirby, J. R. (2015). The effects of vocabulary breadth and depth on English Reading. *Applied Linguistics*, 36(5), 611-634.
- Mehrpour, S., Razmjoo, S. A., & Kian, P. (2011). The relationship between depth and breadth of vocabulary knowledge and reading comprehension among Iranian EFL learners. *Journal of English Language Teaching and Learning*, 2(222), 97-127.
- Milton, J. (2013). Measuring the contribution of vocabulary knowledge to proficiency in the four skills. In C. Bardel, C. Lindqvist, & B. Laufer (Eds.), *L2 vocabulary acquisition, knowledge, and use: New perspectives on assessment and corpus analysis* (pp. 57-78). Euro SLA. Retrieved on 23 March, 2017, from the World Wide Web: <http://www.eurosla.org/monographs/EM02/Milton.pdf>
- Moinzadeh, A., & Moslehpour, R. (2012). Depth and breadth of vocabulary knowledge: Which really matters in reading comprehension of Iranian EFL learners? *Journal of Language Teaching and Research*, 3(5), 1015-1026.
- Na, L., & Nation, I. S. P. (1985). Factors affecting guessing vocabulary in context. *RELC Journal*, 16(1), 33-42.
- Nation, P. (1983). Testing and teaching vocabulary. *Guidelines*, 5, 12-25.
- Nation, I. S. P. (1990). *Teaching and learning vocabulary*. New York: Newbury House.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.
- Opel, A., Ameer, S. S., & Aboud, F. E. (2009). The effect of preschool dialogic reading on vocabulary among rural Bangladeshi children. *International Journal of Educational Research*, 48(1), 12-20.
- Paribakht, T. S. (2004). The role of grammar in second language lexical processing. *RELC Journal*, 35(2), 149-160.
- Phillips, D. (2006). *Longman complete course for TOEFL test*. New York: Longman Group/A Pearson Education Company.

- Qian, D. D. (1998). *Depth of vocabulary knowledge: Assessing its role in adults' reading comprehension in English as a second language*. Unpublished doctoral dissertation, University of Toronto, Canada.
- Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review*, 56(2), 282-307.
- Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading comprehension: An assessment perspective. *Language Learning*, 52(3), 513-536.
- Qian, D. D., & Schedl, M. (2004). Evaluation of an in-depth vocabulary knowledge measure for assessing reading comprehension. *Language Testing*, 21(1), 28-52.
- Rashidi, N., & Khosravi, N. (2010). Assessing the role of depth and breadth of vocabulary knowledge in reading comprehension of Iranian EFL learners. *Journal of Pan-Pacific Association of Applied Linguistics*, 14(1), 81-108.
- Read, J. (1989). *Towards a deeper assessment of vocabulary knowledge*. Paper presented at the 8th Annual Meeting of the International Association of Applied Linguistics, Sydney, New South Wales, Australia.
- Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing*, 10(3), 355-371.
- Read, J. (1998). Validating a test to measure depth of vocabulary knowledge. In A. Kunnan (Ed.), *Validation in language assessment* (pp. 41-60). Mahwah, NJ: Lawrence Erlbaum.
- Read, J. (2000). *Assessing vocabulary*. Cambridge: Cambridge University Press.
- Read, J. (2004). Plumbing the depths: How should the construct of vocabulary knowledge be defined? In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language: Selection, acquisition, and testing* (pp. 209-227). Amsterdam: John Benjamins Publishing Company.
- Salvucci, S., Walter, E., Conley, V., Fink, S., & Saba, M. (1997). *Measurement error studies at the National Center for Education Statistics (NCES)*. Washington, D.C.: U.S. Department of Education.
- Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research*, 12(3), 329-363.
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge: Cambridge University Press.
- Schmitt, N. (2010). *Researching vocabulary: A vocabulary research manual*. Basingstoke: Palgrave Macmillan.
- Schmitt, N. (2014). Size and depth of vocabulary knowledge: What the research shows. *Language Learning*, 64(4), 913-951.
- Shiotsu, T., & Weir, C. J. (2007). The relative significance of syntactic knowledge and vocabulary breadth in the prediction of reading comprehension test performance. *Language Testing*, 24(1), 99-128.
- Siddiqua, A. (2016). Challenges of teaching English vocabulary at the higher secondary level in Bangladesh. *The Journal of EFL Education and Research*, 1(1), 1-8.
- van Gelderen, A., Schoonen, R., de Glopper, K., Hulstijn, J., Simis, A., Snellings, P., & Stevenson, M. (2004). Linguistic knowledge, processing speed, and metacognitive knowledge in first and second language reading comprehension: A componential analysis. *Journal of Educational Psychology*, 96(1), 19-30.
- Wesche, M., & Paribakht, T. S. (1996). Assessing second language vocabulary knowledge: Depth vs. breadth. *Canadian Modern Language Review*, 53, 13-40.
- Zhang, D. (2012). Vocabulary and grammar knowledge in L2 reading comprehension: A structural equation modelling study. *Applied Linguistics*, 21, 117-126.
- Zhang, D., & Koda, K. (2017). Assessing L2 vocabulary depth with word associates format tests: Issues, findings, and suggestions. *Asian-Pacific Journal of Second and Foreign Language Education*, 2(1), 1-30.
- Zhang, Y., Lin, C. H., Zhang, D., & Choi, Y. (2017). Motivation, strategy, and English as a foreign language vocabulary learning: A structural equation modelling study. *British Journal of Educational Psychology*, 87, 57-74.

Zhang, D., & Yang, X. (2016). Chinese L2 learners' depth of vocabulary knowledge and its role in reading comprehension. *Foreign Language Annals*, 49(4), 699-715.



© 2020 by the authors. Licensee Shahid Chamran University of Ahvaz, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution–NonCommercial 4.0 International (CC BY-NC 4.0 license). (<http://creativecommons.org/licenses/by-nc/4.0/>).

