



## The Contribution of Syntactic and Lexical Knowledge to Foreign Language Reading Comprehension\*

### *Yapı Bilgisi ve Sözcük Bilgisinin Yabancı Dilde Okuduğunu Anlama Becerisine Katkısı*

Dr. Samet TAŞÇI<sup>1</sup>, Prof. Dr. Ümit Deniz TURAN<sup>2</sup>

#### Abstract

The current study was designed to identify the relative significance of syntactic and lexical knowledge in English as a Foreign Language (EFL) reading comprehension of 254 adult Turkish university students. The role of two dimensions of lexical knowledge, lexical depth and breadth in L2 reading comprehension were also examined in the current study. A Syntactic Knowledge Test (SKT), Reading Comprehension Test (RCT) composed of TOEFL, Vocabulary Levels Test (VLT) and Word Associates Test (WAT) were used in the data collection process. Correlation and multiple regression analyses were utilized to analyze the data. The data analyses showed that all variables of the study positively and significantly correlated with each other. Moreover, all independent variables together significantly predicted RCT scores of the participants. However, when each variable was examined separately, syntactic knowledge was the most contributive variable to L2 reading comprehension. Lexical breadth also significantly explained L2 reading comprehension of EFL learners. The unique contribution of lexical depth to L2 reading comprehension was very low and not significant. Moreover, the independent variables were also correlated with each other. The findings of the current study were compared with the previous findings, discussed and justified in accordance with them. Pedagogical implications were offered.

**Keywords:** L2 reading comprehension, syntactic knowledge, lexical breadth, lexical depth

**Paper Type:** Research

#### Öz

Bu çalışmanın amacı İngilizceyi yabancı dil olarak öğrenen 254 yetişkin Türk üniversite öğrencisinin yabancı dilde okuduğunu anlama becerisinde İngilizce yapı bilgisi ve İngilizce sözcük bilgisinin katkısını belirlemektir. İkinci dilde okuduğunu anlama becerisinde sözcük bilgisinin iki boyutunun, sözcük derinliği ve sözcük dağarcığı, rolü de incelenmiştir. Bu çalışmanın veri toplama sürecinde İngilizce yapı bilgisi testi, yabancı dilde okuduğunu anlama testi, İngilizce sözcük düzey testi ve sözcük ilişkilendirme testleri kullanılmıştır. Veri analizinde nicel veri analiz yöntemleri kullanılmış ve veri analizinde korelasyon ve çoklu regresyon analizi gerçekleştirilmiştir. Veri analiz sonuçları, bu çalışmanın bütün değişkenlerinin anlamlı bir biçimde ve pozitif yönde birbiriyle ilişkili olduğunu göstermiştir. Ayrıca tüm bağımsız değişkenler birlikte katılımcıların İngilizce okuduğunu anlama testi puanlarını anlamlı bir biçimde yordamıştır. Bununla birlikte, her bir bağımsız değişken ayrı ayrı incelendiğinde, yapı bilgisinin, yabancı dilde okuduğunu anlama becerisine en çok katkıda bulunan bağımsız değişken olduğu sonucuna varılmıştır. Ayrıca sözcük düzey testi de yabancı dil öğrenenlerin okuduğunu anlama düzeyini önemli ölçüde açıklamıştır. Sözcük derinliğinin ikinci dilde okuduğunu anlamaya özgün katkısının ise çok düşük olduğu ve anlamlı olmadığı sonucuna varılmıştır. Dahası, bağımsız değişkenlerin de birbirleriyle ilişkili olduğu bu çalışmanın bir diğer bulgusudur. Bu çalışmanın bulguları alan yazındaki diğer çalışmaların bulguları ile karşılaştırılmış ve tartışılmıştır. Bu çalışmanın bulgularından hareketle eğitimsel çıkarımlar önerilmiştir.

\* This article is a part of PhD. dissertation titled “The role of L2 lexical and syntactic knowledge in L2 reading comprehension of Turkish EFL learners” prepared by the first author at Anadolu University, Turkey.

<sup>1</sup>Nevşehir Hacı Bektaş Veli University, Faculty of Education, samettasci@nevsehir.edu.tr.

<sup>2</sup>Anadolu University, Faculty of Education, udturan@anadolu.edu.tr.

**Atf için (to cite):** Taşçı, S., ve Turan, U. D. (2021). The contribution of syntactic and lexical knowledge to foreign language reading comprehension. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi*, 23(1), 97-112.

**Anahtar Kelimeler:** Yabancı dilde okuduğunu anlama, yapı bilgisi, sözcük dağarcığı, sözcük derinliği

**Makale Türü:** Araştırma

## Introduction

Reading in a foreign language is accepted as crucial for various reasons such as education, professional success, and personal development (Oakhill, Cain, & Elbro, 2015). In particular, it is an important skill not only for personal development, but also for academic achievement or language proficiency in general and L2 learners need to maintain fluency and accuracy in L2 reading comprehension because inadequate reading proficiency prevents students from attaining essential tools for further reading which, in turn, causes them to suffer academically (Koda & Zehler, 2008). However, it is not an easy skill for many EFL learners because L2 reading comprehension is multifaceted and involves the interaction of various cognitive sub-skills (Grabe, 2009; Jeon & Yamashita, 2014; Koda, 2005). Among these various cognitive sub-skills, L2 linguistic knowledge, i.e., lexical and syntactic knowledge, was stated to be equally important and the best predictors of L2 reading comprehension (*see* Jeon & Yamashita, 2014). Researchers also stated that inadequate lexical knowledge or deficiency in syntactic knowledge caused difficulty in comprehending L2 texts (Gass & Selinker, 2008; Richards & Rodgers, 2001). Despite such significance, the role of syntactic and lexical knowledge in L2 reading comprehension appears to be uncertain. Although some earlier studies reported that syntactic knowledge was the strongest contributor of L2 reading comprehension (Shiotsu, 2010; Shiotsu & Weir, 2007), some others disclosed that lexical knowledge predicted L2 reading comprehension better than syntactic knowledge (Nassaji, 2003; Zhang, 2012). Therefore, there is no consensus on the contributive performance of lexical or syntactic knowledge in L2 reading comprehension of EFL students.

The inconsistency between the findings of previous studies has been justified by a number of reasons, two of which are worth mentioning. First, most of previous studies considered lexical knowledge as a unidimensional construct. However, lexical knowledge has multidimensional structure (Anderson & Freebody, 1981; Qian, 1999; Schmitt, 2014). Thus, it is necessary to dissect the effects of sub-dimensions of lexical knowledge in order to better understand the predictive power of lexical knowledge in L2 reading comprehension. Second, lexical and syntactic knowledge may have differing contribution to L2 reading comprehension depending on the language distance between L1 and L2 groups (Jung, 2009). Accordingly, it is essential to explore the predictive power of syntactic and lexical knowledge in L2 reading comprehension of L1 Turkish EFL learners. Consequently, multidimensional structure of lexical knowledge and considering L1 background of the learners may present more accurate picture of syntactic and lexical knowledge in L2 reading comprehension. Determining their predictive performances in L2 reading comprehension may provide practical suggestions for instructors to adapt teaching materials in reading classes (Koda, 2007).

## 1. Literature Review

### 1.1. Lexical Knowledge

Lexical knowledge is widely accepted as an essential component for reading comprehension. Studies both in L1 (Ouellette, 2006; Tannenbaum, Torgesen & Wagner, 2006) and in L2 (Laufer, 1992; Laufer & Ravenhorst-Kalovski, 2010; Nassaji, 2003; Qian, 1998) have found lexical knowledge to be a vital predictor of reading comprehension. However, the amount of the contribution that lexical knowledge provides has not been constant across studies. Moreover, most of previous studies considered lexical knowledge as a unidimensional construct and focused largely on lexical breadth in measuring lexical knowledge of learners (Schmitt, 2014; Zhang, 2012). However, lexical knowledge was widely accepted to have at least two different dimensions: *breadth* and *depth* (Anderson & Freebody, 1981; Schmitt, 2014). While breadth or

size is associated with the number of words known by a learner, depth dimension is related to the quality of knowing these words (Anderson & Freebody, 1981). Nevertheless, there is a discussion over the usefulness of depth dimension in the literature because of high correlation between breadth and depth. On the one hand, some previous studies proposed that there is not conceptual difference between breadth and depth dimensions and these dimensions are affected by the same factors for learners (Vermeer, 2001). On the other hand, some others suggested that breadth and depth dimensions of lexical knowledge are empirically and conceptually inter-connected yet lexical depth had unique contribution to reading comprehension; therefore, these variables need to be treated uniquely (Qian, 1999, 2002).

Koda (2005) proposed that the relationship between lexical knowledge and L2 reading comprehension is higher than that of the relationship between reading comprehension and any other language skill. In L1 contexts, Tannenbaum et. al. (2006) indicated that breadth and depth/fluency model provided the best fit to the data and these factors explained significantly 50 percent of variance in reading comprehension. In L2 context, Laufer (1992) aimed to find out the necessary threshold level for effective reading and suggested that learners need to know at least 3000-word families to comprehend L2 texts, which was accepted as a lexical threshold by the researcher. The lexical threshold required for L2 reading comprehension was revisited and it was proposed that there were two different lexical thresholds: *the optimal threshold* consists of 8000-word families, with the coverage of 98%, and *the minimal threshold* consists of 4000-5000-word families with the coverage of 95% (Laufer & Ravenhorst-Kalovski, 2010). Qian (2002) revealed that there were close and positive link among lexical depth, lexical breadth, and L2 reading comprehension. The researcher concluded that depth and breadth had equal importance in university level ESL reading. On the other hand, Li & Kirby (2014) stated that both dimensions of lexical knowledge had contributive role in reading comprehension; however, these dimensions had differing predictive power in different reading measures.

Some other studies compared the relative contribution of lexical knowledge and that of syntactic knowledge in the prediction of L2 reading comprehension. For example, Nassaji (2003) revealed that vocabulary knowledge had a more important role than syntactic knowledge in discriminating good readers from less-skilled ones. In a similar vein, Zhang (2012) found that the relative contribution of lexical knowledge was significant after controlling for syntactic knowledge while the relative contribution of syntactic knowledge was not significant after controlling for lexical knowledge, and concluded that lexical knowledge had better performance than syntactic knowledge in predicting L2 reading comprehension of adult Chinese students.

## 1.2. Syntactic Knowledge

Syntactic knowledge is connected to reading comprehension and students should know the syntactic constructions of sentences in order for text comprehension take place (Gottardo et. al., 2018). Similarly, Jung (2009) noted that “even though reading comprehension is mostly conceptual, it still is affected by the knowledge of grammar either directly or indirectly” (p, 29). Therefore, it can be concluded that syntactic processing is needed for meaning construction of a reading text.

In spite of its considerable contribution to reading comprehension, syntactic knowledge is often overlooked (*see* Grabe, 2009; Shiotsu & Weir, 2007). The reason for this might be the strong correlation between syntactic knowledge and lexical knowledge which has caused an overemphasis of lexical knowledge in reading research (Shiotsu, 2010; Shiotsu & Weir, 2007). Urquhart & Weir (1998) referred to the problem of separating the measure of syntax from other sources of knowledge and advised to take “formal” “structuralism” model of syntactic knowledge with little emphasis on “meaning” or “communicative value” while measuring it.

Results of the previous studies on the predictive role of syntactic knowledge in L2 reading comprehension is ambiguous. While some studies found that students need some degree of syntactic knowledge to read fluently and comprehensively (Nergis, 2013; Shiotsu & Weir, 2007),

some others found that syntactic knowledge did not account variance or limited degree of variance in L2 reading comprehension (Brisbois, 1995; Lopez, 2008; Ulijn & Strother, 1990).

Nergis (2013), for example, investigated the role of depth, syntactic awareness and metacognitive awareness in the academic reading of Turkish undergraduate EAP learners. The results showed that morphological awareness was the best contributor of academic reading, followed by syntactic awareness. Depth was not found to contribute to the academic reading success of Turkish participants. Similarly, Shiotsu & Weir (2007) conducted a componential analysis in EFL and ESL contexts to find out contributory factors of L2 reading. The results showed that the variance in L2 reading comprehension can be best explained by syntactic knowledge even in the subgroup analysis. On the other hand, Lopez (2008) revealed statistically significant correlation between grammar knowledge and L2 reading comprehension of 186 Spanish university students; however, grammar knowledge accounted for only 0.22 percent of the variance in L2 reading comprehension. The researcher concluded that the scores in L2 reading comprehension cannot be predicted by the scores of grammar knowledge.

In addition to the role of syntactic knowledge in L2 reading comprehension, other studies have focused on the effects of syntactic simplification on L2 reading comprehension of learners. For example, Yano, Long & Ross (1994) revealed that students who read the linguistically simplified texts scored significantly higher in L2 reading comprehension test than the students who read the original ones. This result indicates that comprehending texts with less complex grammatical structures tends to be easier than comprehending texts with more complex grammatical structures. In other words, an interpretation for such a result may be that an L2 reader who has sufficient syntactic knowledge may not have any problem in comprehending structures of original L2 texts. On the contrary, Ulijn & Strother (1990) stated a minor role of syntactic simplification in L2 reading comprehension. The researchers asserted that the syntactically simplified version of L2 reading text did not really help the students to comprehend better or to read more quickly, either for the natives or for the non-natives. The researchers implicated that syntactic knowledge plays a minor role in reading comprehension of native and non-native advanced readers.

Comparing the relative contribution of syntactic and lexical knowledge to L2 reading comprehension, Maftoon & Tasnimi (2014) supported the superiority of syntactic knowledge over lexical breadth and metacognitive awareness in the prediction of L2 reading comprehension of Iranian EFL learners. In a similar context, Atai & Nikuinezhad (2012) demonstrated that syntax explained more variance in L2 reading comprehension than vocabulary knowledge. On the other hand, Brisbois (1995) asserted that L2 vocabulary knowledge contributed more than that of L2 grammatical knowledge, which in most cases contributes the least, to L2 reading comprehension of the participants. Moreover, the researcher stated that L2 grammatical knowledge did not significantly contribute to L2 reading comprehension scores of either beginners or upper levels.

In conclusion, previous findings have shown that the role of syntactic and lexical knowledge in L2 reading comprehension is unclear. Some studies were in favor of lexical knowledge as the best predictor of L2 reading (Brisbois, 1995; Nassaji, 2003; Ulijn & Strother, 1990; Zhang, 2012) while some others accepted syntactic knowledge as the stronger predictor of L2 reading (Atai & Nikuinezhad, 2012; Maftoon & Tasnimi, 2014; Nergis, 2013; Shiotsu & Weir, 2007; Yano, Long & Ross, 1994). Thus, in the light of previous literature, this study examined the predictive power of lexical and syntactic knowledge in L2 reading comprehension of adult Turkish EFL students. The research questions addressed in this study are as follow:

1. What is the relationship among lexical knowledge, syntactic knowledge, and L2 reading comprehension of EFL learners?
2. Which one of the variables, namely lexical breadth, lexical depth or syntactic knowledge, is a better predictor of L2 reading comprehension of EFL learners?

## 2. Method

### 2.1. Participants

The participants of the current study were 289 EFL students; however, the data from 254 participants were used for the data analysis on the grounds that thirty-five of them were left out of the study because they did not complete all the tasks required for the study or they were outliers. The participants were 2<sup>nd</sup> and 3<sup>rd</sup> year students studying at English Language Teaching Department of a Turkish public university. Non-probabilistic sampling method was employed in the selection of the participants because the participants were available, convenient, and represented target characteristics that the researchers seek to study (Creswell, 2012). The students were required to achieve sufficient scores from a standardized national examination to enroll the ELT program. Moreover, students had to pass a proficiency and a placement exam conducted by Anadolu University, School of Foreign Languages to be exempt from English preparation class and to start their education in their department. Before the data collection phase an approval was obtained that there was no ethical problem in the study with the decision numbered 5898 of Anadolu University Ethics Committee.

### 2.2. Instruments

This study aimed to explore the contribution of syntactic and lexical knowledge to L2 reading comprehension scores of the participants. Thus, each variable was under investigation. In total, there were four instruments used in the current study. The instruments were a Reading Comprehension Test, Vocabulary Levels Test, Word Associates Test, and a Syntactic Knowledge Test.

#### 2.2.1. Reading Comprehension Test

Appropriate Reading comprehension sections of retired TOEFL tests were used to assess reading levels of the participants. In the compilation process of the Reading Comprehension Test (RCT), the titles of the reading texts and short summaries of the texts found in the reading comprehension part of the TOEFL were given as a small-scale questionnaire to the students. They were asked to check the most interesting topics and they were asked whether they had read anything about the topics of the texts or not. Among 12 TOEFL reading texts, three reading texts that were the least known and rated highest for interest by participants were chosen. Through this procedure researchers were attempting to control for topic familiarity, another important variable of reading comprehension. Three texts with 42 questions were determined as reading comprehension test of the study and the test were sent to field expert to assess whether the questions measure reading or not. Some questions of the test were eliminated on grounds that they did not measure reading comprehension. In the final version of the reading test, there were 31 reading comprehension questions and the possible maximum point that can be achieved from the test was 37. The test was found to be reliable ( $\alpha=.77$ ).

Before application of the test, a lexical frequency profile of the passages was calculated through VocabProfile software (Cobb, 2002), and readability scores were determined through the Readability website (<http://www.readabilityformulas.com>). Readability, on the other hand, uses a type of readability formula and allows us to score the difficulty of a text. The Gunning FOG readability index was used to calculate the readability score of the texts. Readability index compares syllables and sentence lengths. A Fog score of 5 is readable, 10 is hard, 15 is difficult, and 20 is very difficult. Lexical frequency profile and readability scores of the texts are as shown in table 1.

Table 1. Lexical frequency profile and readability scores of the texts

	K1 Words (1-1000)	K2 Words (1001-2000)	Academic Word List Words	Readability Score
Orientation and Navigation	81.51%	3.13%	7.68%	13.3
Biological Clocks	66.57%	3.95%	15.09%	19.5
Transition to Sound in Film	71.75%	8.13%	9.42%	19.7

### 2.2.2. The Vocabulary Levels Test

The Vocabulary Levels Test (VLT) version (Schmitt, Schmitt & Clapham, 2001) was used for measuring lexical size of the participants. The test is composed of 5 levels measuring lexical breadth at the 2000, 3000, 5000, 10000, and an academic vocabulary level. In each part of the test, there are 10 questions and each question has six written forms of words with three definitions. Students are asked to match each definition with three written forms using the following form. Each correct answer is worth 1 point and the possible maximum score that can be achieved in the test is 150.

Figure 1. A sample question from the Vocabulary Levels Test

1 clerk	
2 frame	<u>6</u> a drink
3 noise	<u>1</u> office worker
4 respect	<u>3</u> unwanted sound
5 theater	
6 wine	

### 2.2.3. The Word Associates Test

The Word Associate Test (WAT) developed by Read (1993, 1998) was used to assess the quality of lexical knowledge of the participants. In each item of the test, there is a target word and eight options, four of which are associated with the target word. Students were expected to match the target word with other 4 associated words.

Figure 2. A sample question from the Word Associates Test

#### **Broad**

full	moving	<u>quiet</u>	<u>wide</u>	night	<u>rivers</u>	<u>shoulders</u>	<u>smile</u>
------	--------	--------------	-------------	-------	---------------	------------------	--------------

In the design of the WAT, Read (1998) took some criteria into consideration. For example, only adjectives are used as target words to provide consistency in the relationship of the target and its associates. Furthermore, rather than random selection, Read (1998) used purposeful selection of the adjectives which test takers have at least familiarity. In addition, the answers were distributed randomly to prevent or to minimize wild guessing. A sample question from WAT is as demonstrated in figure 2 above. The WAT composed of 40 questions, and each question is worth 4 points. Therefore, the possible maximum score that can be achieved from the test is 160.

### 2.2.4. Syntactic Knowledge Test

Grammar section of the ECPE by Cambridge Michigan Language Assessment was employed to assess syntactic ability of the readers. The grammar section composed of 40 multiple-choice questions. The Cronbach's Alpha score of the test was .86, which indicated that the test was reliable. VocabProfile (Cobb, 2002) was used to check the validity of the test. The software showed that 87% of the lexical items in the test were between 1-1000 frequency level. Therefore,

syntactic knowledge test (SKT) measured only the syntactic ability of the readers rather than lexical knowledge or reading comprehension ability of the participants.

Each item of SKT was checked by field experts to determine whether it contained a variety of syntactic constructions. Syntactic construction types found in the test were identified by field experts. Some questions required the knowledge of more than one type of syntactic knowledge simultaneously. The syntactic structures found in the test are as in Table 2.

Table 2. Essential types of syntactic structures found in the syntactic knowledge test

Grammatical Structures	Number of the items
Infinitive or Gerund Complements	3
Modals and Phrasal Modals	4
Subordinating and Coordinating Conjunctions	2
Prepositions and Prepositional Phrases	3
Comparatives and Superlatives	1
Adverbials	1
Adverbial Clauses	2
Pronouns and Reference	3
Passive Voice	2
Relative Clauses	4
Non-referential <i>it</i> and <i>there</i>	2
Word order	3
Adjectives and Adjective Phrases	4
Tense and Aspect	3
Noun Clauses	3
<b>TOTAL</b>	<b>40</b>

### 2.3. Data Collection and Analysis Procedures

These tests were administered to the students in their regular classes over two separate weeks. In line with the aim of the current study, a quantitative research design in which the researcher collects numeric data from the participants and analyzes them using statistics, was used. Both skewness and kurtosis of the values were checked. The outliers were determined by scatterplot and excluded from the study. In the process of data analysis, the Pearson-product moment correlation analysis was conducted to reveal the relationship between the variables. In addition, assumptions of regression were checked and multiple regression analyses were carried out to explore the total and the unique contribution of each variable to L2 reading comprehension. Simple bivariate regression is used to predict scores on one variable on the basis of scores on the second (Brantmeier, 2004). In other words, regression analysis allows us to find out the unique variance of independent variables accounted for in the dependent variable.

### 3. Results

The descriptive statistics of the participants' scores in RCT, VLT, WAT and SKT are illustrated in Table 3 below. The table shows the number of participants, minimum and maximum scores achieved by the participants, the optimal scores that can be taken, mean scores, standard deviations, and standard errors.

Table 3. Descriptive statistics of the study

	Number of participants	Min.	Max.	Optimal Score	Mean	Standard Deviation	Standard Error
RCT	254	5	35	37	19.96	6.254	.392
VLT	254	65	145	150	104.83	16.258	1.020
WAT	254	55	142	160	100.83	18.665	1.171
SKT	254	10	38	40	23.91	5.527	.347

RCT= Reading Comprehension Test Scores of the whole sample

VLT= Vocabulary Levels Test Scores of the whole sample

WAT= Word Associates Test Scores of the whole sample

SKT= Syntactic Knowledge Test Scores of the whole sample

The first research question investigated the relationship among vocabulary breadth, depth, syntactic knowledge and L2 reading comprehension. A Pearson Product Moment Correlation analysis was employed to reveal the relationship between the RCT, VLT, WAT, and SKT scores of the participants. Table 4 below shows the correlation matrix of the variables. According to table 4, all the variables correlated positively and significantly with each other. In other words, participants obtaining high scores from a test were likely to obtain high scores from the other tests. First of all, the table showed that the RCT scores (M=19.96, SD=6.254) and the VLT scores (M=104.83, SD=16.258) highly and significantly correlated ( $r=.598$ ,  $p<.01$ ), which indicates that RCT and VLT scores were likely to be parallel to each other among the participants of the study.

Table 4. Pearson Product Moment Correlation analysis of the variables

	RCT	VLT	WAT	SKT
RCT	1	.598**	.446**	.614**
VLT		1	.565**	.612**
WAT			1	.529**
SKT				1

RCT= Reading Comprehension Test Scores of the whole sample  
 VLT= Vocabulary Levels Test Scores of the whole sample  
 WAT= Word Associates Test Scores of the whole sample  
 SKT= Syntactic Knowledge Test Scores of the whole sample

Another significant and high correlation appears to be between SKT (M=23.91, SD=5.527) and RCT scores ( $r=.614$ ,  $p<.01$ ), as can be seen from the fact that when RCT scores of the participants increased, their SKT scores increased as well. The correlation between WAT (M=100.83, SD=18.665) and RCT was also significant but moderate ( $r=.446$ ,  $p<.01$ ) meaning that RCT and WAT scores were congruent with each other among the participants. The correlation between VLT and WAT scores was found to be high and significant ( $r=.565$ ,  $p<.01$ ). The participants obtaining high scores from VLT were likely obtain high scores from WAT as well.

Looking at our data, we can note that all of the independent variables namely lexical depth, lexical breadth, and syntactic knowledge significantly correlated with L2 reading comprehension. The most highly correlated variable with L2 reading comprehension was syntactic knowledge followed by lexical breadth and depth.

To find the best predictor of L2 reading comprehension among the variables of breadth, depth and syntactic knowledge, a linear multiple regression was run. The analysis shows the shared contribution of each variable to the dependent variable (Pallant 2010). The linear multiple regression analysis below shows how well this set of variables together are able to predict L2 reading comprehension of the participants. R square tells us how much of the variance in L2 reading comprehension is explained by this set of variables. R square was found to be .458; therefore, lexical breadth, depth, and syntactic knowledge all together explained for about 46 percent of the variance in L2 reading comprehension of the participants ( $R^2= .458$ ,  $F(3,250) = 70.479$ ). All independent variables together significantly contributed to L2 reading scores of the participants ( $p <.01$ ).

Table 5. Multiple Regression for lexical breadth, lexical depth, syntactic knowledge, and L2 reading comprehension

Model	Model Summary			Std. Error of the Estimate	Change Statistics			
	R	R Square	Adjusted R Square		F Change	Df1	Df2	Sig
1	.677	.458	.452	4.631	70.479	3	250	.001

a. Predictors: (Constant), Lexical Breadth, Lexical Depth, Syntactic Knowledge

Table 6 below, tells us how much unique variance each of the independent variables (lexical breadth, depth and syntax) explains in L2 reading comprehension. To compare the unique

contribution of each variable, we will use Standardized Beta scores. The highest beta score indicates the best predictor of L2 reading comprehension.

Table 6. Relative contribution of lexical breadth, lexical depth, and syntactic knowledge to L2 reading comprehension

Variables	B	Standard Error	$\beta$	<i>t</i>	<i>Sig.</i>
Lexical breadth	.128	.024	.334	5.287	.001
Lexical depth	.019	.020	.056	.958	.339
Syntactic knowledge	.430	.069	.380	6.200	.001

a. Dependent Variable: Reading Comprehension  
 $R^2 = .458, p < .01$

Of these three variables, syntactic knowledge provided a significant and the largest unique contribution to L2 reading comprehension ( $\beta = .380, p < .01$ ). Similarly, the unique contribution of breadth to L2 reading comprehension of the participants was significant ( $\beta = .334, p < .01$ ). However, the predictive power of lexical breadth was identified to be less than that of syntax. In the model, lexical depth was not found to contribute to L2 reading comprehension of the participants ( $\beta = .056, p > .05$ ). In other words, while syntactic knowledge and lexical breadth positively and significantly predicted L2 reading comprehension of the participants, with syntactic knowledge having slightly more of an effect size, lexical depth did not make any significant unique contribution to L2 reading comprehension of the participants.

## Discussion

The significant correlations of the measures with L2 reading comprehension are reasonable considering that reading requires the operation of multiple cognitive processes and the highly complex interaction of sub-skills, such as vocabulary and syntax (Grabe, 2009). The result of the current study is consistent with the result of previously related correlational studies (Atai & Nikuinezhad, 2012; Binder et al., 2017; Gascoigne, 2005; Horiba, 2012; Li & Kirby, 2014; Ouellette, 2006; Tannenbaum et al., 2006).

Previous research has shown that there is a strong correlation between lexical knowledge and reading comprehension both in L1 (Binder et al., 2017; Ouellette, 2006; Tannenbaum et al., 2006) and in L2 contexts (Horiba, 2012; Li & Kirby, 2014). Regarding L1 contexts, Ouellette (2006) found that vocabulary breadth and depth significantly correlated with reading comprehension, and stated that reading comprehension is related to both breadth and depth. In L2 contexts, Horiba (2012) found out that for Chinese and Korean students, reading comprehension had a moderate and significant relation to both vocabulary breadth and depth. Similarly, Li & Kirby (2014) noted that four vocabulary tests measuring lexical breadth and depth significantly correlated with L2 reading comprehension measures. All of these studies revealed significant relation between lexical breadth, depth, and reading comprehension of children or adults both in L1 and L2 contexts. In other words, performance in lexical knowledge affected reading comprehension.

As with lexical knowledge, syntactic knowledge was also found to be correlated with L2 reading comprehension in this study. Previous correlation research findings also supported the relationship between syntactic knowledge and reading comprehension both in L1 (Bowey, 1986) and L2 contexts (Atai & Nikuinezhad, 2012; Gascoigne, 2005). In L1 contexts, Bowey (1986) noted that syntactic knowledge is significantly related to reading comprehension by suggesting that children's ability to correct grammatically incorrect sentences correlates with reading comprehension. As for L2 context on the relationship between syntactic knowledge and reading comprehension, Gascoigne (2005) suggested that the success in form focused grammar activities was congruent with meaning driven reading comprehension tasks. Similarly, Atai & Nikuinezhad (2012) showed a significant relationship between the measures of lexical and syntactic knowledge and L2 reading comprehension of intermediate high school students in an Iranian context.

Another important finding of the study is that independent variables of the study significantly and highly correlated with each other. This finding may be justified by considering that vocabulary knowledge and syntactic knowledge are fundamentally associated. In other words, lexical items are found in grammatical context and lexical knowledge also involves knowing or anticipating grammatical patterns the lexical items found in (Paribakht, 2004). Therefore, it is difficult to think of vocabulary and grammar as separate entities. As for the high and positive correlation between lexical depth and breadth, Qian (2002) expressed that “The more words a learner knows, the more likely it is that he or she will have a greater depth of knowledge for these words” (p. 517). Consequently, these two variables are not completely separate from each other. The high correlation between these two dimensions of lexical knowledge has led some researchers to contend that there is no conceptual difference between depth and breadth of vocabulary knowledge (Vermeer, 2001, p. 231). The significant and positive correlation between lexical breadth and lexical depth may be explained by the overlap between these two variables.

The regression analysis showed the contribution of syntactic knowledge to L2 reading comprehension was more than that of breadth and depth. Our findings appear to be supported by the previous studies (Shiotsu & Weir, 2007; Yalin & Wei, 2011), albeit not all of them (Brisbois, 1995; Haynes & Carr, 1990; Ulijn & Strother, 1990). Shiotsu & Weir (2007) revealed that lexical breadth significantly contributed to L2 reading comprehension but not as much as syntactic knowledge. The relative contribution of syntax was bigger than that of lexical breadth in predicting L2 reading performance. Based on the findings, Shiotsu & Weir (2007) noted the role of lexical knowledge is overstated while that of syntax is understated. The researchers also implied the necessity to develop syntactic knowledge to enhance reading ability. Similarly, Yalin & Wei (2011) noted that “no matter how many words students have acquired, if they fail to understand the syntactic structures of the sentences, they are still unable to comprehend the reading text” (p. 123).

Not all of the previous research findings supported the superiority of syntactic knowledge over vocabulary breadth (Brisbois, 1995; Haynes & Carr, 1990; Ulijn & Strother, 1990). Testing the effects of syntactic simplification and background knowledge, Ulijn & Strother (1990) found no statistically significant difference between the groups reading syntactically simplified and unsimplified versions. Such a result led the researchers to propose that poor L2 reading is caused not by a deficiency in syntactic knowledge but rather inadequate lexical breadth. However, in the study of Ulijn & Strother (1990), the reading comprehension score of natives and non-natives was very high for simplified and original texts, and the researchers warned against the generalization of the results by asserting that reading tests might not be sensitive enough to show the effect of syntactic knowledge

Brisbois (1995) and Haynes & Carr (1990) also supported the superiority of lexical breadth over syntactic knowledge in L2 reading comprehension. Brisbois (1995) investigated the role of L1 reading, L2 lexical breadth and L2 syntactic knowledge to L2 reading comprehension of 131 students that enrolled in French at the U.S. air force academy. The hierarchical regression analysis of the study concluded that L2 lexical breadth consistently contributed more to L2 reading comprehension of the participants than did the L2 grammar scores, which contributed less. Similarly, Haynes & Carr (1990) proposed that the correlation between vocabulary and L2 reading comprehension was higher than that between grammar and L2 reading comprehension for Chinese readers of English; however, the multiple regression result with timed L2 reading measures as dependent variable in Haynes & Carr’s study revealed significant contribution of syntactic knowledge to L2 reading.

In the studies of Brisbois (1995) and Haynes & Carr (1990), there were some methodological problems. In these studies, while syntactic knowledge was measured by the items taken from standardized tests that measure general proficiency of learners, lexical breadth was measured by asking the meaning of the words found in the provided reading passages. Therefore, these studies measured general knowledge of syntax but specific word knowledge. In addition to

that, Brisbois (1995) always entered L2 grammar after L1 reading and L2 lexical breadth to hierarchical model on the grounds that they contributed more to reading. As the order in hierarchical model matters, the results of Brisbois may be misleading. In sum, Brisbois (1995) and Haynes & Carr's (1990) studies cannot be interpreted as clear evidence of superiority of lexical knowledge unless the studies are replicated by a more rigorous methodology.

The potential reasons for the superiority of syntactic knowledge over lexical breadth in L2 reading comprehension of adult ELT learners could be due to the syntactic structures found in the passages, measures of reading comprehension of the current study, and reading proficiency levels of the students. First of all, if the syntactic structures of the passages were the ones for which students already have well-developed knowledge, they might compensate comprehension losses by depending more on their syntactic knowledge. That is, if the participants do not know the meaning of each word found in the reading passages, to some extent, they may use other sources of information such as syntactic knowledge. Moreover, Givón (1995) suggested that syntactic knowledge provides readers basic cuing information in comprehending a text and stated that "overt grammatical signals -syntactic constructions, morphology, intonation- cue the text processor, they guide in the construction of a coherent mental representation of the text; and this is a vital cognitive boost" (p. 343).

Reading comprehension levels of the participants was measured by multiple choice questions. By answering multiple choice questions, the participants might have used syntactic cues found in the reading texts such as articles, tense/aspect, conjunctions, to aid comprehension. Considering the reading comprehension texts used in the current study, the length of the sentences might be a reason for syntactic knowledge to be a slightly stronger predictor of L2 reading comprehension. In other words, looking at the lexical profile of the texts, most of the vocabularies are between 1 to 1000 frequency. Even though The Gunning Fox readability indices showed the texts are difficult to read, The Gunning Fox readability formula calculates the readability of the texts based on the distribution of the total number of the words by the number of the sentences. Thus, the sentences of the texts are long with frequent words. This may be a reason for our participants to depend more on their syntactic knowledge while making sense of the sentences.

Another possible explanation for the superiority of syntax over breadth in L2 reading comprehension might be the L2 reading proficiency level of the participants. Shiotsu & Weir (2007) noted that "syntactic knowledge remains one of the deciding factors in the performance on text reading comprehension for learners up to a certain level" (p. 121). Although L2 proficiency level of the participants was not measured, participants were 2<sup>nd</sup> and 3<sup>rd</sup> year students of the ELT department and they had a proficiency exam before enrolling the faculty. Thus, they have a certain level of proficiency.

This study also showed that depth did not directly contributed to L2 reading comprehension of the participants. There was a significant and high correlation between lexical breadth and depth ( $r=.565, p<.01$ ). Therefore, there might be a lot of shared variance when breadth and depth were entered into the model together. This might be explained by the overlap between breadth and depth. This finding seems to be consistent with related studies (Nurweni & Read, 1999; Tannenbaum, et. al., 2006; Vermeer, 2001). Nurweni & Read (1999) estimated the vocabulary knowledge of Indonesian first year university students and expressed that depth and breadth may overlap when learners have advanced level of proficiency but may diverge when the learners have lower level of proficiency. Investigating the association between lexical knowledge and reading comprehension of 3<sup>rd</sup> grade native students, Tannenbaum et al. (2006) reported that the correlation between breadth and reading comprehension were higher than the correlation between depth and reading comprehension and these two dimensions had significant overlapping variance. On the other hand, Vermeer (2001) stated that there was no conceptual difference between depth and breadth and depth test was as good measure as the breadth test in measuring learners' lexical knowledge. It can be concluded that the VLT might have overlapped with the words found in the WAT and prevented the depth factor from attaining significance. On the

contrary, Zhang & Yang (2016) revealed that lexical breadth and depth contributed differently across different L2 reading tasks. The researchers found that lexical depth contributed more to short texts while the contribution of lexical breadth was more to long reading tasks. The justification for such a finding was that because long texts were lexically complex, they required readers to know meanings of words. Therefore, the present study in which long reading texts followed by multiple-choice questions may not demanded the readers knowledge of lexical depth in reading comprehension.

## **Conclusions**

The current study attempted to examine the relationship between L2 vocabulary size, depth, syntactic knowledge, and L2 reading comprehension of adult Turkish EFL learners. A Pearson Product Moment Correlation analysis revealed that there were significant and positive interrelationship among the variables of the current study. Therefore, it can be concluded that an increase in a variable positively affected the other variables as well. The multivariate regression analysis revealed that among the independent variables of the study, syntactic knowledge made the highest contribution to the L2 reading comprehension of adult Turkish EFL students. The findings of the current study also showed that vocabulary breadth had a substantial contribution to the L2 reading comprehension of adult Turkish EFL learners. These findings led us to conclude that successful L2 reading comprehension required the operation of syntactic ability and high levels of lexical breadth. Another important finding of the study was about the role of lexical depth. Depth did not make any direct contribution in the multiple regression analysis when entered with lexical breadth and syntactic knowledge. This finding can be interpreted as the overlap between the variables. In this context, Tannenbaum et. al. (2006) pointing out the overlap between depth and breadth stated “the two dimensions of word knowledge have significant overlapping variance that contributes to the prediction of reading comprehension.” (p. 381). This finding led us to conclude that it is difficult to disassociate these three components and that they share a substantial variance which contributes to L2 reading comprehension.

The findings of the current study shed light on the role of breadth, depth, and syntax in L2 reading comprehension of adult Turkish EFL learners. The results of the study offer some practical implications. Lexical breadth and syntactic knowledge should be emphasized in L2 reading instructions. However, the needs of the students should be determined first. In other words, failure in L2 reading comprehension may result from insufficient lexical breadth or syntactic knowledge. The contribution of these components in L2 reading comprehension is different; therefore, the emphasis of each kind of knowledge should be different based upon EFL reading proficiency of the students. Second, although syntactic knowledge was found to be a better predictor of L2 reading comprehension, EFL instructors are recommended to increase the learners’ lexical breadth in order to enhance students’ reading ability. Instructors should increase lexical breadth of the learners. The best way to increase lexical breadth which is necessary for reading is reading itself (Eskey, 2005). Similarly, Nagy (2005) stated that “wide reading is the primary engine that drives vocabulary growth for older and more able readers” (p. 29). The current study also revealed that lexical depth did not directly contribute to L2 reading comprehension of the participants; however, higher levels of lexical depth are associated with greater syntactic knowledge and lexical breadth which in turn would contribute to L2 reading comprehension. Direct instruction of lexical relations such as paradigmatic, syntagmatic, or collocational would be helpful to adult L2 learners to increase their lexical size and syntactic knowledge

Although the current study seems to have notable findings and contributes to the field, there is always room for improvement. The current study was conducted with Turkish adult learners. It is recommended for further studies to replicate this study with learners having different L1 backgrounds and different age groups to explain the exact role of breadth, depth, and syntax in L2 reading comprehension.

The current study focused only on lexical knowledge, syntactic knowledge and L2 reading comprehension. However, in order to study overall second language acquisition, further studies are needed. Further studies are recommended to include additional dependent variables, especially productive ones such as speaking and writing. Such an improvement may provide a clearer picture of the role of lexical and syntactic knowledge.

Different conceptualizing of depth and using different depth measures may have an effect on the contribution of depth variable to L2 reading comprehension (Schmitt, 2014). Therefore, further studies are recommended to use different lexical depth measures.

## References

- Anderson, R. C. & Freebody, P. (1981). Vocabulary knowledge. In J. T. Guthrie (Ed.), *Comprehension and teaching: Research reviews* (pp. 77-117). Newmark: International Reading Association.
- 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 (IJAL)*, 15(1), 1-18.
- Binder, K. S., Cote, N. G., Lee, C., Bessette, E., & Vu, H. (2017). Beyond breadth: The contributions of vocabulary depth to reading comprehension among skilled readers. *Journal of Research in Reading*, 40(3), 333-343. doi: <https://doi.org/10.1111/1467-9817.12069>
- Bowey, J. A. (1986). Syntactic awareness and verbal performance from preschool to fifth grade. *Journal of Psycholinguistic Research*, 15(4), 285-308.
- Brantmeier, C. (2004). Statistical procedures for research on L2 reading comprehension: An examination of ANOVA and regression models. *Reading in a Foreign Language*, 16(2), 51-69.
- Brisbois, J. E. (1995). Connections between first- and second-language reading. *Journal of Reading Behavior*, 27(4), 565-584.
- Cobb, T. (2002). Web VocabProfile [accessed 7 March 2018 from <http://www.lexutor.ca/vp/eng/>], an adaptation of Heatley, Nation & Coxhead's Range.
- Creswell, J. W. (2012). *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson Education.
- Eskey, D. E. (2005). Reading in a second language. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 563- 580). New Jersey: Lawrence Erlbaum.
- Gascoigne, C. (2005). Toward an understanding of the relationship between reading comprehension and grammatical competence. *The Reading Matrix*, 5(2), 1-14.
- Gass, S., & L. Selinker (2008). *Second language acquisition. An introductory course.* (3rd ed.). New York: Routledge.
- Givón, T. (1995). Coherence in text vs. coherence in mind. In M. A. Gernsbacher and T. Givón (Eds.), *Coherence in spontaneous text* (pp. 59–115). Philadelphia/Amsterdam: John Benjamins.
- Gottardo, A., Mirza, A., Koh, P. W., Ferreira, A., & Javier, C. (2018). Unpacking listening comprehension: the role of vocabulary, morphological awareness, and syntactic knowledge in reading comprehension. *Reading and Writing*, 31(8), 1741-1764. <https://doi.org/10.1007/s11145-017-9736-2>
- Grabe, W. (2009). *Reading in a second language: Moving from theory to practice.* New York: Cambridge University Press.

- Haynes, M., & Carr, T H (1990) Writing system background and second language reading: a component skills analysis of English reading by native speaker- readers of Chinese, in T. H. Carr and B. A. Levy (Eds.) *Reading and its development: Component skills approaches* (pp. 375–421). San Diego: Academic Press.
- Horiba, Y. (2012). Word knowledge and its relationship to text comprehension: A comparative study of Chinese and Korean speaking L2 learners and L1 speakers of Japanese. *Modern Language Journal*, 96(1), 108–121. <https://doi.org/10.1111/j.1540-4781.2012.01280.x>
- Jeon, E. H., & Yamashita, J. (2014). L2 reading comprehension and its correlates: A meta-analysis. *Language Learning*, 64(1), 160–212. <https://doi.org/10.1111/lang.12034>
- Jung, J. (2009). Second language reading and the role of grammar. *Working Papers in TESOL and Applied Linguistics*, 9(2), 29-48. <https://doi.org/10.7916/D88915FW>
- Koda, K. (2005). *Insight into second language reading*. New York: Cambridge University Press.
- Koda, K. (2007). Reading and language learning: Crosslinguistic constraints on second language reading development. In K. Koda (Ed.), *Reading and language learning* (pp. 1-44). Special issue of *Language Learning Supplement*, 57.
- Koda, K., & Zehler, A. M. (2008). Introduction: Conceptualizing reading universals, cross-linguistic variations, and second language literacy development. In K. Koda & A. M. Zehler (Eds.) *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development* (pp. 1-9). Routledge.
- Laufer, B. (1992). Reading in a foreign language: How does L2 lexical knowledge interact with the reader's general academic ability. *Journal of Research in Reading*, 15(2), 95-103.
- Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learners' vocabulary size and reading comprehension. *Reading in a foreign language*, 22(1), 15-30.
- Li, M., & Kirby, J. R. (2014). The effects of vocabulary breadth and depth on English reading. *Applied Linguistics*, 36(5), 611-634. <https://doi.org/10.1093/applin/amu007>
- Lopez, A. L. (2008). To what extent does grammar knowledge account for competence in FL reading comprehension in university students? *RESLA*, 21, 181-200.
- Maftoon, P., & Tasnimi, M. (2014). Syntactic knowledge, vocabulary breadth, and metacognitive awareness of reading strategies in reading comprehension in self-regulated vs. non-self-regulated readers. *English Language Teaching*, 1(4), 37-61.
- Nagy, W. (2005). Why vocabulary instruction needs to be long-term and comprehensive. In Hiebert, E. and Kamil, M. (Eds.). *Teaching and Learning Vocabulary: Bringing research to practice* (pp. 27-44). Mahwah, NJ: Erlbau.
- Nassaji, H. (2003). Higher-level and lower level text processing skills in advances ESL reading comprehension. *The Modern Language Journal*, 87(2), 261-276. <https://doi.org/10.1111/1540-4781.00189>
- Nergis, A. (2013). Exploring the factors that affect reading comprehension of EAP learners. *Journal of English for Academic Purposes*, 12(1), 1-9. <https://doi.org/10.1016/j.jeap.2012.09.001>
- Nurweni, A., & Read, J. (1999). The English vocabulary knowledge of Indonesian university students. *English for Specific Purposes*, 18(2), 161-175.
- Oakhill, J., Cain, K., & Elbro, C. (2015). *Understanding and teaching reading comprehension: A handbook*. Routledge.

- Ouellette, G. P. (2006). What's meaning got to do with it: The role of vocabulary in word reading and reading comprehension. *Journal of Educational Psychology*, 98(3), 554-566. <https://psycnet.apa.org/doi/10.1037/0022-0663.98.3.554>
- Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS*. Maidenhead.
- Paribakht, T. S. (2004). The role of grammar in second language lexical processing. *RELC Journal*, 35(2), 149-160. <https://doi.org/10.1177%2F003368820403500204>
- 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, Toronto, Ontario, Canada.
- Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review*, 56(2), 282-308. <https://doi.org/10.3138/cmlr.56.2.282>
- Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: An assessment perspective. *Language Learning*, 52(3), 513-536. <https://doi.org/10.1111/1467-9922.00193>
- Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing*, 10(3), 355-371. <https://doi.org/10.1177%2F026553229301000308>
- 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: Erlbaum.
- Richards, J. C., & Rodgers, T. S. (2001). *Approaches and methods in language teaching*. Cambridge, NY: Cambridge University Press.
- Schmitt, N. (2014). Size and depth of vocabulary knowledge: What the research shows. *Language Learning*, 64(4), 913-951. <https://doi.org/10.1111/lang.12077>
- Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the Vocabulary Levels Test. *Language Testing*, 18(1), 55-88. <https://doi.org/10.1177%2F026553220101800103>
- Shiotsu, T. (2010). *Components of L2 reading: Linguistic and processing factors in the reading test performances of Japanese EFL learners*. New York: Cambridge University Press.
- 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. <https://doi.org/10.1177%2F0265532207071513>
- Tannenbaum, K., Torgesen, J. K., & Wagner, R. K. (2006). Relationships between word knowledge and reading comprehension in third-grade children. *Scientific Studies of Reading*, 10(4), 381-398. [https://doi.org/10.1207/s1532799xssr1004\\_3](https://doi.org/10.1207/s1532799xssr1004_3)
- Ulijn, J. M., & Strother, J. B. (1990). The effect of syntactic simplification on reading EST texts as L1 and L2. *Journal of Research in Reading*, 13(1), 38-54. <https://doi.org/10.1111/j.1467-9817.1990.tb00321.x>
- Urquhart, A. H., & Weir, C. J. (1998). *Reading in a second language: Process, product and practice*. New York: Longman.
- Vermeer, A. (2001). Breadth and depth of vocabulary in relation to L1/L2 acquisition and frequency of input. *Applied psycholinguistics*, 22(2), 217-234. <https://doi.org/10.1017/S0142716401002041>

- Yalin, S., & Wei, T. (2011). The relative significance of vocabulary breadth and syntactic knowledge in the prediction of reading comprehension test performance. *Chinese Journal of Applied Linguistics*, 34(3), 113-126. <https://doi.org/10.1515/cjal.2011.028>
- Yano, Y., Long, M. H., & Ross, S. (1994). The effects of simplified and elaborated texts on foreign language reading. *Language Learning*, 44(2), 189-219. <https://doi.org/10.1111/j.1467-1770.1994.tb01100.x>
- Zhang, D. (2012). Vocabulary and grammar knowledge in second language reading comprehension: A structural equation modeling study. *The Modern Language Journal*, 96(4), 558-575. <https://doi.org/10.1111/j.1540-4781.2012.01398.x>
- 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. <https://doi.org/10.1111/flan.12225>

#### ETİK ve BİLİMSEL İLKELER SORUMLULUK BEYANI

Bu çalışmanın tüm hazırlanma süreçlerinde etik kurallara ve bilimsel atıf gösterme ilkelerine riayet edildiğini yazar(lar) beyan eder. Aksi bir durumun tespiti halinde Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi'nin hiçbir sorumluluğu olmayıp, tüm sorumluluk makale yazarlarına aittir. Yazarlar etik kurul izni gerektiren çalışmalarda, izinle ilgili bilgileri (kurul adı, tarih ve sayı no) yöntem bölümünde ve ayrıca burada belirtmişlerdir.

Kurul adı: Anadolu Üniversitesi Etik Kurulu

Tarih: 23.02.2017

No: 5898

#### ARAŞTIRMACILARIN MAKALEYE KATKI ORANI BEYANI

1. yazar katkı oranı: %50

2. yazar katkı oranı: %50