Effects of Reading Strategies and Depth of Vocabulary Knowledge on Turkish EFL Learners' Text Inferencing Skills

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Abstract

Within the framework of foreign language teaching and learning, reading strategies, depth of vocabulary knowledge and text inferencing skills have not been researched extensively. This study tries to fill this gap by analyzing the effects of reading strategies used by Turkish EFL learners and their depth of vocabulary knowledge on their text inferencing skills. Three different measures were used in the study: Word Association Test (WAT), Metacognitive Awareness of Reading Strategies Inventory (MARSI), and inferencing questions used in a standardized national test. The association test and reading strategies scores were regressed on inferencing scores of the participants. The results revealed that depth of vocabulary knowledge was a better predictor of inferencing skills compared to reading strategies. However, the model created by using these two predictors accounted for only 15% of the variance, and the major implication of this result is that there are other more significant factors which affect text inferencing skills of EFL learners than reading strategies and depth of vocabulary knowledge.

Keywords: meta-cognitive reading strategies, depth of vocabulary knowledge, text inferencing

1. Introduction

Reading comprehension in L2 has always been a popular but a controversial issue. Factors affecting second language reading skills are still under discussion (Jeon & Yamashita, 2014). However, little controversy arises over certain aspects of reading skills. For example, it has been established for long that reading involves a number of subskills such as decoding the written text, comprehension of the surface meaning and making deductions or inferences from what is available in the text (Spearitt, 1972). Some other researchers have made use of a distinction between inferencing as text memory, text inferencing, knowledge access, and knowledge-based inferencing (Hannon & Daneman, 2001). Among these subskills, making inferences about the text is regarded as central to reading comprehension (Farr, Carey, & Tone, 1986). In the context of the current study, inferencing is regarded as the ability to understand the implicit meanings provided in a text written in L2. Since inferencing ability has been considered to be one of the most important subskills in L2 reading (Oakhill & Garnham, 1988), it is obvious that all the possible factors affecting this skill need to be analyzed. Although depth of vocabulary knowledge and meta-cognitive reading strategies are among such factors, they have not been studied extensively in the same framework. Therefore, this study aims to reveal the predictive powers of depth of vocabulary knowledge and reading strategies that are used by EFL learners in L2 text inferencing.

Research on second language vocabulary learning reveals that in order to operate in English effectively, a large vocabulary and a number of lexical knowledge aspects need to be acquired (Schmitt, 2008). It is commonly agreed that vocabulary is one of the fundamental and central components of second language learning (Carter & McCarthy, 1988; Nation & Newton, 1997; Daller, Milton, & Treffers-Daller, 2007). Therefore, special attention has been paid to L2 vocabulary and underlining the distinction between vocabulary size and depth.

A substantial research literature is available on vocabulary learning, and vocabulary size/depth are among the focused research topics. Vocabulary size is defined as the number of words that a learner knows while vocabulary depth is regarded as how well those words are known (Schmitt, 2014). Vermeer (2001) opposes such a clear cut distinction by claiming that it is impossible to separate size from depth in terms of conceptuality. Some studies claim that vocabulary depth has an influential interpretive role in addition to vocabulary size (Qian,

1999, 2000). Dealing with size and depth needs to take into consideration not only lexical knowledge but also word associations. However, associations alone are not enough to explain everything about vocabulary depth. Schmitt (2008) asserts that besides a great number of lexical items, a learner also needs to know a great deal about each item so as to use them efficiently.

Conceptualizing the size of vocabulary knowledge is clear-cut when compared to vocabulary depth. Vocabulary size, as stated above, refers to the number of lexical items that are known and it can be reflected in the operation of form-meaning links, whereas vocabulary depth is regarded as a more complicated component as its conceptualization depends on some sophisticated measures (collocation, derivative forms and polysemous meaning senses). Besides, Nation (2001) claims that two kinds of vocabulary learning approaches should be adopted in order to increase exposure to vocabulary: intentional and incidental learning, corresponding roughly to the size of vocabulary knowledge and vocabulary depth respectively. Some of the aspects, like form and meaning, seem to be appropriate for intentional learning; some others, like contextualized aspects, e.g., collocations, are not quite suitable for explicit teaching.

The ways to conceptualize vocabulary depth are not independent; rather they are interrelated and interdependent. Although it is not easy to measure size or depth due to their complexity, vocabulary depth could be measured by dividing it into separate components or aspects because it is too broad a construct to be measured as one component. One of the most essential points about depth and size relates to how each of them is conceptualized and measured (Schmitt, 2014).

Some types of word knowledge are suitable for intentional study (e.g., form and meaning) while some others should be dealt with in the contextual use (e.g., register constraints and frequency). The types of word knowledge such as meaning and form are mastered earlier than the implicit types such as collocations and register that need to be used in various contexts (Ellis, 2012). Although form is generally acquired through exposure, it is important to focus on it centrally in vocabulary exercises because knowledge of form aids other aspects of vocabulary learning. It is also important to note that, if form is being addressed in the classroom, it should be done with a direct focus and not just as a side-note to meaning (Schmitt, 2008). According to Barcroft (2002) learning word forms may be problematic, so learning can be facilitated by providing a simple link between meaning and form. After form and meaning have been learned, more contextualized word knowledge may be achieved. For intentional learning to take place, words and word phrases must be taught explicitly, for explicit instruction results in greater and faster gains towards mastery in production.

Data from three studies by Laufer (2005) reveal that intentional learning yields better results than incidental learning. Research on vocabulary learning has suggested many useful principles for establishing learning tasks. First, it is essential to maximize learners' engagement with the target lexicon and to provide learners with as many opportunities as possible for repeated exposure. Nation (1990) suggests recycling the previously studied words instead of teaching new words all the time. Unless a recently learnt vocabulary is recycled systematically, forgetting it is inevitable.

In order to investigate to what extent form and meaning are different constructs and the degree to which they are linked to each other, Laufer and Paribakht (1998) used two tests, the Vocabulary Levels Test to measure form recognition size and the Productive Vocabulary Levels Test to measure form recall size. Overall, they concluded that when the frequency level increases, the recognition-recall gap decreases. This means that the correlation between recognition and recall will be strong, which indicates that the mastery of recognition and recall will be met in the high frequency level.

In one study carried out by Meara, Lightbown and Halter (1997), a greater lexical organization is seen essential for developing depth of vocabulary knowledge. Those items that need to be used in a contextual manner are regarded as productive while form and meaning stay in the receptive level (Meara et al., 1997). Another important point about depth conceptualization is how learners make use of lexical items. To answer this question, a distinction is commonly made between receptive and productive mastery of lexical items. Being able to comprehend lexical items during listening and reading is receptive. However, the ability to produce these items during speaking and writing is productive. Productive mastery is regarded as more complex or progressive because more lexical knowledge elements are involved. Moreover, most of these elements are contextual and they need more time to develop.

1.1 Vocabulary Size and Depth

Various ways have been used to conceptualize the knowledge of vocabulary size and depth (see Bardakçı, 2016 for a recent one). A large number of studies have been conducted to show the relationship between depth and size through measuring the multiple word knowledge aspects. Depending on the studies that have been carried

out by researchers with the consideration of word aspects, it can be deduced that as vocabulary size increases, the relationship between size and depth might become weaker. On the contrary, size and depth relationship is stronger in smaller vocabulary sizes (Chui, 2006; Shimamoto, 2000).

Conceptualizing vocabulary depth is also feasible by measuring the mastery degree of single word knowledge aspect. In a series of studies that have been conducted by Verhallen and Schoonen (1993) through interviewing participants and considering their language proficiency test (TOEFL), they have suggested that as the knowledge of polysemous meaning senses increases, the vocabulary size also increases.

Another way of conceptualizing vocabulary depth and the degree of its relation to vocabulary size is derivation. Researchers came to the conclusion that the size and derivative knowledge have a moderate or even sometimes weak relationship (Schmitt & Meara, 1997; Schmitt & Zimmerman, 2002). Furthermore, a large vocabulary size is not a good indication of better knowledge of derivational morphology.

There are few studies conducted about the relation between the vocabulary size and collocations. The studies that have been carried out separately by Laufer and Goldstein (2004) and Nizonkiza (2012) are worth mentioning. The IELTS and TOEFL examinations were used in the first and second studies respectively. Both studies showed that there is a strong relationship between the mastery of collocations and higher degrees of language proficiency.

Lexical organization has become the most widespread way of the conceptualization of vocabulary depth. However, the results of the studies depending on lexical organization to compare size and depth are not clear. Akbarian (2010) used Vocabulary Level Test (VLT) and Word Association Format to find out the relation between vocabulary sizes and lexical organization and concluded that lexicons become more organized as vocabulary sizes increase. In another study comparing vocabulary size and depth, Zhang (2012) applied Structural Equation Modelling and found that vocabulary size has stronger weighting on vocabulary knowledge than depth. Depending on the studies relating to lexical organization, it is difficult to consider the relative strength of vocabulary size and depth (Schmitt, 2014).

1.2 Reading Strategies

In addition to the studies on vocabulary size and depth in second language reading research, there are also some recent studies focusing on the importance of reading strategies in second language learning. It is generally claimed that reading is an active process in which readers use their background knowledge and some contextual clues to make inferences (Goodman, 1967; Smith, 1979, 1982; Clarke & Silberstein, 1977; Coady, 1979). When the related literature is reviewed, it can be observed that the role of meta-cognitive awareness has been in focus recently. Reading ability has been linked to metacognition, which is an awareness of how thinking takes place. The concept of metacognition is used to better explain the deliberate, conscious strategies that competent readers use.

According to Auerbach and Paxton (1997) "metacognition entails knowledge of strategies for processing texts, the ability to monitor comprehension, and the ability to adjust strategies as needed" (pp. 240-41). There is ample evidence to show that competent use of reading strategies to understand a text can make the difference between a skilled and a poor reader (Paris & Jakobs, 1984). Studies on metacognitive awareness of reading strategies stimulated researchers to investigate more about the readers' knowledge related to reading and reading strategies. One of these studies conducted by Sheorey and Mokhtari (2001) compared two groups of students, one group being composed of native speakers of English and the other non-native speakers in terms of their metacognitive awareness of the reading strategies. The findings of the study indicated that both groups of the participants were aware of the strategies included in the survey and referred to the same order of importance to the categories of the reading strategies included in the survey.

Component-skill approach to reading is another approach used in the field of second language reading research. According to this approach, reading consists of various cognitive processes such as decoding vocabulary knowledge, syntactic processing, metacognition and different measurement of sub-skills (Jeon & Yamashita, 2014). It is believed that such an approach may be helpful in the identification of major "predictors of reading among L2 readers with varying characteristics" (Jeon & Yamashita, 2014, p. 161).

Individual differences were the focus of meta-analysis as well. For instance, Jeon and Yamashita (2014) tried to find out whether individual differences in L2 reading comprehension results from L2 language knowledge (vocabulary, grammar) or by variance stemming from more language-general, cognitive and metacognitive processes. Their meta-analysis study focused on ten passage-level reading correlates of L2 reading comprehension and seven moderator levels. The results indicated that L2 grammar knowledge, vocabulary

knowledge and L2 decoding were the strongest correlates of L2 reading comprehension while metacognition was the weakest one.

Research on L2 reading strategies indicates that there are many factors that restrict or assist the use of reading strategies such as learner's age, exposure to or previous experience with the target language. Regarding exposure to and experience with the target language, Sanders (2004) carried out a study with students in the US learning Italian as a foreign language. Those that had been exposed to Italian for 4 or 5 years used considerably more strategies than those with less exposure. Concerning learners' age, Pressley and Afflerbach (1995) and Baker (2008) have discovered that skilled adult readers focus on cognitive and metacognitive strategies more often while younger readers get benefit from decoding strategies. Moreover, Alhaqbani and Riazi (2012) focused on Arabic as an L2 and aimed to discover university students' metacognitive awareness of reading strategies. They also tried to find out other potential factors affecting the use of reading strategies in the Arabic academic context. The findings indicated that the participants generally had a high level of metacognitive awareness, and the students' academic experience and their nationalities were found to be significant factors affecting their use of reading strategies.

By looking at the studies mentioned so far, we can clearly see that research on L2 reading strategies and vocabulary knowledge is quite extensive. However, the number of studies concerning text inferencing skills of EFL learners and their vocabulary size are quite limited. The present study is built on the previous studies on L2 reading and aims to determine the effect of depth of vocabulary knowledge and metacognitive reading strategies on inferencing in reading comprehension. Hence, our aim is to provide answers to the following research question:

To what extent do metacognitive reading strategies and depth of vocabulary knowledge affect Turkish EFL learners' text inferencing skills?

2. Methodology

2.1 Participants

The population for the current study consisted of 70 freshmen majoring in English language teaching (ELT) at a state university in Turkey. Of the 70 participants, 80% (n=56) were females and 20% (n=14) were males. The age range of the participants was between 18 and 25, the mean being 22.

2.2 Instrumentation and Procedures

To gather data, three instruments namely the Word Association Test (WAT), the Metacognitive Awareness of Reading Strategies Inventory (MARSI) and an inferencing test were used.

2.3 Word Association Test (WAT)

The Word Association Test was first developed by Read (1993) and measures the learners' depth of vocabulary knowledge by using synonymy and collocation. Version 4.0 of the WAT developed by Qian (2002) was used in this study. Permission to use the test was obtained through personal contact with Dr. Qian, who reported the reliability of this version as 0.89. There are 40 items in the test and each item has a target word and two columns with four words. The words in the first column can be a synonym or synonyms of the given word while the words in the second column are collocations used with that word. Each item has four correct answers the arrangements of which can be in one of the following combinations: (a) two in the first column and two in the other; (b) three in the first column and one in the second column; (c) one in the first and three in the second. The following figure shows two examples of WAT items:

Please tick the correct options for each item.

1. Peak

| (A)initial | (B)top | (C)crooked | (D)punctual | (E)time | (F)performance | (G)beginning | (H)speed |

2. Accurate

| (A)exact | (B)helpful | (C)responsible | (D)reliable | (E)error | (F)event | (G)memory | (H)estimate |

Figure 1. Two examples of WAT items

The participants get one point for each correct answer, and the maximum possible score is 160. The total score that each of the participant gets represents his/her depth of vocabulary knowledge.

2.4 Metacognitive Awareness of Reading Strategies Inventory (MARSI)

MARSI was developed by Mokhtari and Reichard (2002) and assesses readers' metacognitive awareness and their perceived reading strategy use while reading for academic purposes or reading for school subjects. The inventory has 30 items using a 5-point Likert-type scale ranging from 1 (I never do this) to 5 (I always do this), and it has three subscales or factors as Global Reading Strategies, Problem-Solving Strategies and Support Reading Strategies. When administering MARSI, the steps which were explained by Mokhtari and Reichard (2002) in their study were followed.

2.5 Text Inferencing Test

The inference test items for this study were taken from a national standardized proficiency exam commonly used in Turkey. The test comprised four reading paragraphs each followed by three multiple-choice inferencing questions, and each question has five options.

These three instruments were administered to the participants at weekly intervals. The participants completed WAT and inference test within 45-minute class period, and they were allowed to complete MARSI at their own pace.

In order to determine whether reading strategies or depth of vocabulary knowledge is a predictor of EFL learners' performances in reading-related inferencing questions a hierarchical multiple regression analysis was carried out. However, there are some assumptions that need to be met before carrying out a regression analysis, and these assumptions had to be checked. The first assumption that was checked was related to the sampling size. According to Coakes (2005) for a standard regression, at least twenty times more cases than predictors are needed. In the current study, there are two predictors, and this assumption is met with a sample size of 70.

As the next step, in order to see if there are any possible measurement errors, outliers were checked by determining Mahalanobis distance values for each case, and values greater than 15 were removed from the data set, which is a general tendency with populations less than 100 (Field, 2009). The data were collected from 70 participants, but since the data collected from 3 of them were determined as outliers, they were excluded from the analysis.

The assumption related to multicollinearity, which might be a major problem during data analysis if not met, was checked through the variance inflation factor (VIF) scores among the coefficients. Generally, scores greater than 10 and an average score greater than 1 are serious concerns (Field, 2009), and in the current dataset no such scores were detected.

Residual scatterplots were used to test normality, linearity, homoscedasticity and independence of residuals (Coakes, 2005). Histogram, scatter and percent-percent (P-P) plots were used to check these assumptions and no potential problems that would violate them could be detected.

3. Results and discussion

To determine the relative predictive powers of depth of vocabulary knowledge and reading strategies over inferencing questions, reading strategy and word association test scores were hierarchically regressed on the inferencing scores of the participants. The results of the initial ANOVA test indicated that when the predictors are reading strategies alone (global, problem solving and support), there was no significant effect on the inferencing scores ($F_{(3, 63)} = 1.478$, $p > .05$). However, ANOVA results for word association knowledge along with reading strategies indicated a statistical significance ($F_{(4, 62)} = 2.866$, $p > .05$). Two models were created to determine the potential predictive powers of reading strategies alone and depth of vocabulary knowledge together with these strategies. These models are demonstrated in Table 1.

Table 1. R^2 table for reading strategies and depth of vocabulary as the predictor inferencing

Model	R	R^2	Adjusted R^2	Standard error of the estimate	R^2 change	Sig. F change
1	.256	.066	.021	5.072	.066	.229
2	.395	.156	.102	4.860	.090	.012

Predictors: (Constant), reading strategies, depth of vocabulary knowledge.

As is clear from Table 1, the R^2 value for Model 1 is .066, which means that reading strategies explain only about 6.6% of the variance in inferencing scores with 5.072 as standard error of the estimate. In the second model, where word association scores are calculated with the reading strategy scores, the R^2 value is .156, and this means that the second model can explain 15.6% of the variation. When the change in the R^2 change is examined, it becomes clear that the change stemming from the inclusion of the word association test scores is .090, which is statistically significant ($p < .05$). To see this interaction between the predictors in details, Table 2 can be analysed.

Table 2. The results of regression analysis for reading strategies and word association

| Model | Unstandardized coefficients | | Standardized coefficient | | |
	B	Standard error	(β)	t	Sig.
1 (Constant)	7.660	5.01		1.502	.138
WAT	.104	.040	.318	2.576	.012
Global	.053	.138	.077	.381	.705
Problem solving	.070	.183	.060	.383	.703
Support	.032	.166	.039	.192	.848

Dependent variable: inferencing.

The results of the hierarchical regression analysis for reading strategies and word association scores are displayed in Table 2. In the table, reading strategy scores are displayed separately. Interestingly, none of the reading strategies seems to have an effect on the inferencing scores of the participants (β = .077, .060, .039; p>.05). On the other hand, with obviously larger t and β values, the word association scores (β = .318, p < .05) seem to be a strong predictor of the inferencing scores.

The relationships between L2 reading strategies and comprehension are not simple and straightforward (Carrell, Pharis & Liberto, 1989). There are a number of factors playing role in effective L2 reading and comprehension, and L2 vocabulary knowledge is just one of them. However, as was mentioned earlier, the number of studies concerning text inferencing skills of EFL learners and their vocabulary size are quite limited. In the related literature, it has been suggested that the advanced L2 readers benefit from the general inferencing skill as a compensation for skills such as vocabulary knowledge and word recognition (Mcmillion & Shaw, 2008). The results of the current study suggest that the otherwise could also be discussed; depth of vocabulary knowledge might be helping L2 learners to make inferences about the text.

The current results also indicate that although depth of vocabulary knowledge is statistically a more powerful predictor of text inferencing in L2, it is not a very significant one because the variance that can be explained depending on depth of vocabulary knowledge is only about 15% (see Table 1). There are other factors that affect L2 comprehension and inferencing skills. The point worth mentioning here is that reading is obviously a schema-based process in which patterns of thought are organized and their relations are activated, and if somehow there are mismatches between the prior knowledge of the reader and the text at hand, which has been referred to as content-schemata (Carrell, 1983), comprehension and memory will become poor (Carroll, 2008).

The results of some studies suggest that depth of vocabulary knowledge is a more powerful predictor of lexical inferencing in L2. For example, after examining the relationship between ESL learners' depth of vocabulary knowledge, their lexical inferencing strategy use and their ability to derive word meaning from context, Nassaji (2004) found a significant relationship between depth of vocabulary knowledge and the degree and type of strategy use and success. He claimed that learners with stronger depth of vocabulary knowledge made use of certain types of strategies more frequently compared to those with weaker depth of vocabulary knowledge. Furthermore, the stronger students used certain types of lexical inferencing strategies more effectively and depth of vocabulary knowledge appeared as a significant contribution to inferential success when compared to learner's degree of strategy use.

The potential relationship between lexical and text inferencing is also worth mentioning. For example, Nassaji (2003) reports the results of his study in which he analysed the use of strategies and knowledge sources in L2 lexical inferencing and their relationship with inferential success. The results showed that "(a) overall, the rate of

success was low even when learners used the strategies and knowledge sources they had at their disposal, (b) different strategies contributed differentially to inferencing success, and (c) success was related more to the quality rather than the quantity of the strategies used." (p. 645). The implication of these findings was a need to support a model distinguishing between reading strategies and the ability to make use of these strategies appropriately and effectively. The same might be the case with the results of the current study related to reading strategies as they were in no way significant predictors of inferencing skills. It seems that, EFL learners who make use of a variety of reading strategies without training will go through problems on the way to effective comprehension of a text written in L2; therefore, training about reading strategies is very likely to help EFL learners to develop better inferencing skills.

5. Conclusion and Suggestions

Reading has been proclaimed to involve assorted knowledge and skill based components. Jeon and Yamashita (2014) displayed the existence of interrelations between L2 reading comprehension and variables such as decoding vocabulary knowledge, syntactic processing, metacognition and differential measurement of sub-skills. It has also been substantiated that vocabulary, working memory and general lexical access processes are components of fluent reading (Baddeley, Logie, Nimmo-Smith, & Brereton, 1985). Sanders (2004) proved the impact of a learner's age and exposure to or previous experience with target language on his/her use of reading strategies. Therefore, it would not be flawed logic to assume that there are quite a few agents that operate on the basic L2 reading comprehension skill.

Studies on factors influencing L2 lexical inferencing skill have also been conducted. Variables such as topic familiarity and passage sight vocabulary (Pulido, 2007), depth of vocabulary knowledge (Nassaji, 2004), grammatical knowledge (Kaivanpanah & Alavi, 2008), perceptual learning style preferences (Shen, 2010), and first language lexicalization (Paribakht, 2005) have been shown to bring about changes in L2 learners' lexical inferencing ability.

What makes the current study novel is the lack of research focusing on the determinants of the ability of inferencing as a general reading skill. Inferencing of ideas from between the lines is regarded an essential sub-skill of general reading proficiency in our study. To the best of our knowledge, we can claim that the current study can be the first attempt to unearth factors influencing inferencing in L2 reading. In this research, we concentrated our attention on the potential effects of vocabulary depth and metacognitive awareness of reading strategies on inferencing.

As previously mentioned in the results section, even if the word association test scores seem to be a stronger predictor of the inferencing scores compared to the reading strategy scores, the variance that the word association test scores can explain seem be around only 15%. One can conclude from this finding that vocabulary depth is one of the many potential determinants of the inferencing ability. However, on its own, it can only slightly explain explain account for the variance on inferencing, which leads us to the deduction that there are other factors that affect L2 learners' inferencing ability.

We suggest that studies inquiring the effects of other variables on inferencing be conducted to help discover the sources of variation on this significant reading skill. Potential variables include grammatical knowledge, learning styles, affective variables such as self-efficacy or anxiety, general world knowledge, beliefs about language learning and so on. In addition, the relationship between lexical and text inferencing is another issue waiting to be resolved.

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