Role of Morphological and Metalinguistic Awareness on Reading among Turkish EFL Learners

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Abstract

This study investigates the effect of morphological treatment on morphological awareness and reading comprehension skill in a foreign language teaching. Experimental design was used in this study which was conducted with 74 freshmen who are studying at Translation and Interpreting Department. Following the Oxford Quick Placement Test and Nation's Vocabulary Knowledge Test, the participants were divided into two groups as experimental and control groups. Before starting the training process, both groups were pretested with 'Morphological Correction Test (MCT)' and 'Reading Comprehension Test (RCT)'. Following the completion of the pre-test, the treatment period of experimental group for 2 semesters started, while the control group completed the same exercises and studies without focusing on the morphological awareness. Behind the training, post-test study was applied to both groups and the differences were analysed. According to the results, the experimental group outperformed the control group in MCT and RCT. In other words, the morphological awareness of the experimental group increased efficiently; in addition to this, their reading comprehension skills developed as well. Besides, it can be said that the participants benefited effectively and consciously from the explicit training period of morphological awareness and this helped them improve their metalinguistic capacity.

Key words: Morphological awareness, Metalinguistic awareness, Reading, Language teaching

Introduction

Vocabulary learning in terms of information of word implications and morphological awareness are the two language abilities theorized to be basic in reading perception. Words are generally comprised of smaller and recognizable units called morphemes and realizing what a morpheme implies encourages one to comprehend or figure the importance of new words. Thus, morphological awareness helps to decode the words, infer their meaning and encourage learners to understand and comprehend the complex words in texts (Amirjalili & Jabbari, 2018; Carlisle, 2003). In literature, there are many studies which contribute morphological awareness realization inside vocabulary learning in English (e.g., Carlisle, 2000; Carlisle & Fleming, 2003; Chen, Ramı'rez, Luo, Geva, & Ku, 2012; Lam, Chen, Geva, Luo, & Hong, 2012; McBride-Chang, Wagner, Muse, Chow, & Shu, 2005; Nagy, Beminger, & Abbott, 2006; Sparks & Deacon, 2015) and emphasize the importance of vocabulary knowledge in reading comprehension (e.g., McKeown, Beck, Omanson, & Perfetti, 1983; Ouellette, 2006). In other words, the faster the learners perceive the words, the more fluent readers they become (Yucel-Koc, 2015). These new words can be from different categories such as academic ones. As indicated by Nagy and Townsend (2012), academic vocabulary is also a crucial instrument for expanding academic achievement. It was also expressed that guidance of academic vocabulary with Latin root and morphologically complex structure using morphological investigation will improve word learning of English language students (Akbulut, 2017; Crosson, McKeown, Moore, & Ye, 2018). As per them, such guidance creates better results for learning academic words by reinforcing semantic and orthographic portrayals and influences lexical access. As indicated in Amirjalili & Jabbari (2018) less frequent words such as academic ones can be accessed by decoding and segmenting them into morphemes.

Considering the correlation between morphology and reading, some studies in literature demonstrate a proof of connection between them in the early school years (Carlisle, 1995; Carlisle & Nomanbhoy, 1993; Champion, 1997).These studies go further by investigating morphological awareness as an another conceivable semantic indicator of reading, i.e., the information of how complex words are comprised of littler units and the capacity to control those units to produce another word (Carlisle, 2000; Kuo & Anderson, 2006). Since the proof which is

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dependent on youthful readers recommend that they profit by a morphological learning methodology in reading (Casalis, Colé, & Sopo, 2004; in Italian, Burani, Marcolini., De Luca, & Zoccolotti 2008; Angelelli, Marinelli, & Burani, 2014), it seems significant to investigate the role of morphological instruction in reading improvement. Morphological instruction goes for improving morphological awareness or the familiarity with morphemic structures (Amirjalili & Jabbari, 2018). Scientists have stressed the requirement for morphological guidance in language education (Fracasso, Bangs, & Binder, 2016; McLeod & Apel, 2015). This is because of the way that, morphological guidance tends to sub-lexical highlights of a language, however this can impact proficiency aptitudes at lexical dimension, for example, word reading, spelling, and vocabulary and supra-lexical dimension, or reading comprehension (Brimo, 2016). In a longitudinal report examining the impacts of morphological awareness on five reading instruments, Kirby et al. (2012) demonstrate that morphological awareness plays an important role in reading and reading comprehension. This thought has additionally been confirmed in Spanish by Medina-Cárdenas and Rueda (2018) and in Chinese (e.g., Li, Anderson, Nagy, & Zhang, 2002; Liu & McBride-Chang, 2010; McBride-Chang, Shu, Zhou, Wat, & Wagner, 2003).

Metalinguistic Awareness

Morphological awareness is one of the subcategories of metalinguistic awareness (Yucel-Koc, 2015) which helps language learners in the learning process and underlies the connection between morphological awareness and education (Amirjalili & Jabbari, 2018). In other words; morphological awareness alludes to the metalinguistic competence in which words are comprised of individual units (i.e., morphemes) which can be examined and controlled in different ways (Carlisle, 1995; Derwing, Smith, & Wiebe, 1995). Inflection, derivation and compounding are three kinds of morphological tasks which permit the alteration of linguistic parts of the word (Vernice & Pagliarini, 2018). In this unit, *inflectional procedures* permit the alteration of linguistic parts of the words, such as number, possessive, and tense (e.g., toy-s, Mary's, walk-ed), *derivational tasks* include the production of new words (e.g., honest, dishonest; happy, happily), and *compounding* refers to generating new words by joining two lexical units together (e.g., moonlight). To get the needed vocabulary knowledge, which is mentioned above, metacognitive and metalinguistic factors assume an essential and a vital role and they help learners acquire needed vocabulary and reading comprehension.

In literature, there are some studies implying the improvement of metalinguistic awareness in bilingual children. For instance; Kuo, Ramirez, Marin, Kim, & Unal-Gezer, (2017) showed that L1 Spanish and English children who were tried out a double (English-Spanish) program demonstrated better morphological derivational awareness both in English and Spanish when they are compared to the other learners who were in general education. The authors emphasized that metalinguistic skills of bilingual children developed with a specific focus in derivational morphology. Another study which is conducted on English speaking children entering a French immersion program at school showed that after only two years of immersion education, children outperformed their peers in a series of metalinguistic tasks and they showed a metalinguistic awareness advantage which is associated with bilingual children (Bialystok, Peets & Moreno, 2014). Except from the metalinguistic studies conducted on bilingual children, what do we know about the development of metalinguistic ability in second language learners by the help of literacy? As Schmidt (2001) proposed, learning a second language is not possible without noticing which is a requirement for learning a language and indicated the importance of metalinguistic awareness. In second language environment, some researchers suggest that language instruction focusing on metalinguistic awareness can cause better language gains (Fotos, 1994; Swain, 1998) and increasing learner's awareness by the help of explicit teaching plays an important role in this environment (Schmidt, 1990). According to Nagy et al., (2006), there is a strong relationship between metalinguistic awareness and reading in which vocabulary growth plays a significant role.

Morphological and Metalinguistic Awareness in Turkish EFL Context

In literature, metalinguistic and morphological awareness are two important interrelated concepts. Competences such as reasoning skills, language skills, linguistic knowledge and word competence play an important role in second language acquisition. From this point of view, there are limited number of studies examining the effect of metalinguistic awareness on morphological awareness in the literature, while studies trying to increase awareness by providing long-term education with explicit learning method are insufficient. Atar (2018), one of the researchers working in the field of metalinguistic awareness in Turkish EFL context, aimed to test that Turkish L2 users judge the grammaticality of generic/habitual real conditions in Turkish. In his study, he used 20 grammaticality judgement tasks while investigating whether Turkish L2 users increased their metalinguistic awareness. According to the results of this comparative study conducted with 15 monolingual and 15 Turkish

L2 users, L2 learning has an effect on L1 of L2 users and L2 users have higher awareness of grammar (Atar, 2018). Besides, Aydın (2018) examined the relationship between metalinguistic knowledge and L2 achievement of Turkish EFL students. According to the results of the study using the two-part Metalinguistic Knowledge Test (MKT), L2 metalinguistic knowledge was found to be weak among intermediate-level Turkish EFL students. Therefore, some suggestions are made considering that metalinguistic knowledge is beneficial for second language acquisition (Aydın, 2018). Çandarlı (2018) who claims that metalinguistic knowledge has a significant effect on second language writing skills, examines the metalinguistic knowledge about the words and sentences used by the freshmen who are learning English as L2. According to the results of the study, the understanding of metalinguistic phrases tends to shift from low and medium level awareness to high level awareness. In addition, this study states that there is a moderate negative correlation between metalinguistic knowledge levels and frequency of lexical phrases in L2 authors' articles. Another study conducted in the context of metalinguistic awareness within Turkish EFL context is the study of Varışoğlu (2018). In this study, the researcher aimed to develop a useful, valid and reliable measurement tool to help prospective teachers determine Turkish metalinguistic awareness. The scale was designed as a 5-point Likert-type and was administered to a total of 480 students. The analysis shows that the scale can be used to determine Turkish metalinguistic awareness and is a valid and reliable measurement tool. According to this result, the same scale can be changed and adapted to be used in English learning as a second language.

In addition to metalinguistic awareness studies, only a limited number of studies in terms of morphological awareness are encountered in the literature. For instance; Aydın and Yıldırım (2017) are among the leading ones. Researchers have investigated the morphological awareness of 168 intermediate-level Turkish EFL students. The results of the study according to Morphological Awareness Test (MAT) which consists of two parts (Sentence Completion and Word Relation) indicate that intermediate-level Turkish EFL students have moderate to high morphological awareness, also perform better in word relation task than sentence completion task. In addition, they showed the highest performance in verb making suffixes. Another study conducted in the field of morphological awareness belongs to Akbulut (2017). The researcher aimed to investigate the relationship between morphological awareness and vocabulary and made an experimental study based on this aim. After 12 weeks of morphological instruction, she presented the Vocabulary Knowledge Test and Morphological Awareness Test consisting of two parts. The results of the study showed that the experimental group obtained higher levels of word recognition and knowledge than the control group. As can be seen in the Turkish literature, the studies investigating metalinguistic and morphological awareness together, performed explicit morphological treatment to improve this awareness and examining the effect of metalinguistic and morphological awareness on reading skills are insufficient. From this point of view, this study aims to contribute to the literature as a study aiming to increase the morphological and metalinguistic awareness after a longitudinal treatment period.

Present Study

The present study investigates the effect of morphological and metalinguistic awareness treatment on reading comprehension of second language learners. In this aspect, limited studies investigate Turkish EFL learners' morphological and metalinguistic awareness (Atar, 2018; Aydın, 2018; Aydın & Yıldırım, 2017; Çandarlı, 2018; Varışoğlu, 2018) after a longitudinal treatment period (Akbulut, 2017). Even in these limited studies considering morphological awareness and instruction, the effects of instruction on reading and reading comprehension have not been considered yet. It is also not known whether receiving instruction in these aspects can increase learners' reading skills in terms of accuracy. Based on these factors, this research aims to investigate two research questions as following:

Q1. Does morphological instruction improve EFL learners' morphological awareness in terms of morphological correction?
Q2. Does morphological instruction have an impact on the improvement of reading comprehension?

Method

Participants

Seventy-four participants (39 female, 35 male) from a state university in Turkey contributed to this study during 2 semesters (fall and spring) of their first year. When they entered their department (Translation and Interpreting) they were tested with Proficiency and Placement Test which was applied by Foreign Languages

School. In this exam, students who get 80 out of 100 score were considered as successful in the Proficiency Exam and passed to the department. At the beginning of the first semester, a total of 74 participants were administered the Oxford Quick Placement Test (OQPT), Nation's Vocabulary Knowledge Test (NVK), and a questionnaire which consists of 11 items. In the questionnaire, they were asked about the age, gender, country of birth, mother tongue and how many years they had learned English. There were also questions about the general individual assessment of basic English skills (reading, writing, listening, speaking and vocabulary) and how many hours per week they devote to reading activity. The purpose of using individual assessment in the questionnaire in addition to OQPT is to see whether the answers given by the participants to the questionnaire are reliable or whether they give realistic answers to OQPT and reach a valid result. From this point of view, the participants' personal score scale means, OQPT results and NVK results are consistent with each other. After the results have been taken, simple random sampling in which "every member of the participants has an equal and independent chance of being selected for the research" (Mackey & Gass, 2015:120) has been used.

Descriptive statistics of the participants obtained from questionnaire are given in Table 1. According to the results, the native language of all participants is Turkish and all of them learn English for over 6-7 years. Their ages are between 18 and 21 (M=19). The mean score of their reading (M=6,13 out of 10), writing (M=5,95 out of 10) and vocabulary knowledge (M= 5,37 out of 10) skills is better than speaking (M= 3,82 out of 10) and listening skills (M=4,32 out of 10). After the inquiries, the mean value was determined by comparing the results of OQPT and NVK and the participants were divided into experimental (N=38) and control group (N=36) in a balanced and random way according to their level. The distribution of the groups was based on the test results and levels of the participants. Of the 41 students in the experimental group, the 3 were unable to implement the treatment and so their data were not used in the final analyses; the 2 from the control group were non-native speakers of Turkish and their results were excluded from the analyses.

Table 1. Descriptive Statistics of Participants

	N	Minimum	Maximum	Mean	Std. Error	SD
Age	74	18,00	21,00	19,3784	,12426	1,06890
Years of L2 learning	74	6,00	15,00	9,2838	,19482	1,67594
Reading	74	1,00	9,00	6,1351	,23036	1,98159
Writing	74	1,00	9,00	5,9595	,23205	1,99616
Speaking	74	1,00	8,00	3,8243	,19656	1,69090
Listening	74	1,00	8,00	4,3243	,20822	1,79121
Vocabulary Knowledge	74	1,00	8,00	5,3784	,20245	1,74154
Hours of Reading	74	1,00	5,00	2,3378	,11904	1,02405
Oxford	74	39,00	58,00	48,7703	,54169	4,65979
Nation's Vocab Know.	74	40,00	58,00	48,5270	,54260	4,66765
Valid N (listwise)	74					

Instruments

The main words used in the treatment and instruments were selected from Longman Communication 3000 list which contains 3000 most frequent words in spoken and written English according to the statistical analysis of the 390 million words contained in the Longman Corpus Network (https://www.lextutor.ca/freq/lists_download/longman_3000_list.pdf). Since the main aim of the study is to create awareness in the relationship of the root with a specific suffixes and prefixes, high-frequent base words were selected to allow the learners to focus on morphology itself. In this aspect, the Longman Communication 3000 represents the core of English language and shows students important words to learn and study for effective communication in spoken or written.

The measures used in the study consist of Morphological Correction Test (MCT) and Reading Comprehension Test (RCT). The main reason for the use of MCT is to see whether the words that contain prefixes, suffixes and roots in the content will form an awareness of the students in terms of morphology. RCT, on the other hand, is to try to understand how the developing metalinguistic and morphological awareness of the students improves their reading comprehension and inference skills.

Morphological Correction Test (MCT)

Morphological Correction Test was used in this study to decide whether explicit morphological treatment and increasing metalinguistic awareness help language learners acquire larger vocabulary knowledge or not. From this point, in this test, students were exposed to a set of sentences which comprise morphologically correct or incorrect words and were expected to recognize the correct form of each underlined word given. The students were asked to state the correct answer expressing YES if the underlined word in the sample sentence given is correct or NO if the word is not correct. There were 30 items on this test and each corresponding to the suffixes and prefixes used in the test was taught during the instruction (see Appendix A.). The examples of this test are as the following:

He was acting in a very <u>childy</u> way. (child) YES/NO
I couldn't find any <u>weakness</u> in his theory (weak) YES/NO
The film was terrible, I felt really <u>boring</u>. (bore) YES/NO

Once the test was adapted and made ready, a Ph.D in linguistics reviewed the tests and some parts were revised. After the pilot study which was presented to a group of students (N=22) in the same department but different from the research group, the validity and reliability were calculated by SPSS. Cronbach's alpha, Kuder Richardson 20 (KR20) and Hoyt's variance analysis are widely used methods for internal consistency reliability estimation. The Kuder-Richardson 20 is only suitable for dichotomously [0,1] measured substances. Cronbach's alpha can be used with both dichotomously [0,1] measured substances and weighted [1,2,3,4,5] measured substances. The Kuder-Richardson 20, Cronbach's alpha and Hoyt's variance analysis formulas yield the same results when all items are measured with dichotomously [0,1] (Bademci, 2011:173). Therefore, in this study, internal consistency analysis of KR20 was performed and Cronbach Alpha coefficient was determined. As shown in Table 2., the MCT has high degree of consistency according to Cronbach alpha results (.895) and was assumed to be reliable.

Table 2. Cronbach's Alpha for MCT

Case Processing Summary			
		N	%
Cases	Valid	22	100,0
	Excluded[a]	0	,0
	Total	22	100,0
Reliability Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items		N of Items
,899	,895		30

Reading Comprehension Test (RCT)

Four reading passages were adapted from Bian's (2017) dissertation for Reading Comprehension Test and prepared according to the Turkish EFL learners' proficiency. In the original form, there are 3 passages and they have less than 20 questions. Following the completion of the pilot study, the participants' views on reading passages were taken into consideration and considered. After the study, the participants stated that the reading passages were so long, therefore they were distracted while reading and they could not focus on the passages for a long time. Following these feedbacks, the views were evaluated and the number of words of the reading passages were reduced; furthermore, one of the reading passages was divided into two and the last shape was given. Finally, 5 different questions for each reading passage were prepared. These questions consist of comprehension questions, inferencing and guessing vocabulary meaning from the context as in the example (see Appendix B.).

(e.g. Rachel Louise Carson received her degrees in marine biology. She is regarded as the public figure who <u>launched</u> the environmentalist movement…

1. Which one is the closest in meaning to the underlined word "launched"?
 a. wrote about   b. reorganized   c. began   d. researched

First, the students were asked to read and scan each reading passage and then they were instructed to answer the questions given in the hand-out. For this test, Cronbach's alpha was .78 according to the pilot study and the results are as seen in Table 3.

Table 3. Cronbach's Alpha for RCT

Case Processing Summary			
		N	%
Cases	Valid	22	100,0
	Excluded[a]	0	,0
	Total	22	100,0
Reliability Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items		N of Items
,779	,780		20

Procedure and Design

This research was an experimental study including pre-test and post-test measures of experimental and control groups. The students in the experimental group received explicit instruction in aspects of derivational and inflectional morphology and parts of speech. Both (experimental and control) groups met with the researcher as the teacher of classes once a week for 200 mins. The study took 26 weeks, but the instruction period was 22 weeks. Pre and post-tests were administered in the first and the last week of the course. MCT was a computerized task and each student was tested individually in laboratory. All sentence patterns of each item in Task 1 (MCT) were presented with a white background at a size about 400X564 pixels. Superlab software program was used to present stimuli and collect the data. Before the experiment, pre-experimental trials were presented to the participants and oral and written instructions were given. After the instructions, participants completed the MCT task marking 'Yes' or 'No'. Each answer was recorded by the help of SV-1 Voice Key and Response Pad. The first trial started with a fixation cross on the screen centre for 250 ms. When the participants heard the beep sound on this fixation time, they understood that the experiment was about to start. Then a blank screen was presented for 500 ms., another trial appeared on the screen. The participants completed 3 practice trials and 30 trials for MCT. The procedure was as follows: As for *Task 1 (MCT),* the practice trials were presented before the experiment and they were trained to read the sentences (each has 8 words) and recognize whether the underlined word in each sentence correct or incorrect. Following the practice trials, the experimental period started with need instructions again. They were told to press as soon as possible a button on the keyboard marked with "Yes" or "No" to provide their answers. Regarding *Task 2 (RCT)* was a comprehension task and it tackled the competence in reading related to morphological awareness. The students had to read the passages and answer the following questions given after the texts. Accuracy scores for each question and each passage were obtained from the students.

Treatment

In this study, experimental group received morphological instruction (for 22 weeks) based on affixes (prefixes and suffixes) and roots. The basic list of affixes and root was created and adapted by Wilde (2006). In the Wilde's "Building Vocabulary: Prefixes, Roots and Suffixes List", there are 32 prefixes, 23 suffixes and 27 roots and it was used in the treatment period since they all include Longman Communication 3000 list. This list includes 3000 most frequent words in spoken and written English based on Longman Corpus Network as mentioned before. The words with different morphological structure were presented in written with different texts as much as in spoken with different videos and short films. Afterward, the instruction about parts of speech in English was given to help them identify the forms of vocabulary items. All students in experimental group received explicit and direct instruction in morphological analysis. Table 1. shows the steps of instruction plan as follows:

Table 4. Morphological Instruction Plan

Week	Experimental Group Instruction Period
Fall Semester	
Week 1-2	Pre-test for MCT and RCT
Week 3-4-5 (12hours)	Teaching point: 5 prefixes, 4 roots, 4 suffixes with their meanings and exercises
	Teaching steps:
	1. presenting the base and its meaning; the definition of the base was taught directly by the teacher in print and power-point presentation visually,
	2. introducing prefixes and exercises about adding prefixes to related roots, (e.g. dis-honest)
	3. teaching the meaning of each word giving examples in non-native language

	and explaining the parts of speech of each word when they are added prefixes, 4. introducing suffixes and exercises about adding suffixes to related roots, (e.g. skill-ful) 5. teaching the meaning of each word giving examples in non-native language and explaining the parts of speech of each word when they are added suffixes, (e.g. popular -adj.; popularity- n.), 6. combining both prefixes and suffixes to the roots and explaining the parts of speech of each word based on the suffix or prefix (e.g.im-moral-ity, immoral-adj; immorality-n.)
Week 6-8-9 (12 hours)	Teaching point: 5 prefixes, 5 roots, 4 suffixes with their meanings and exercises Teaching steps are the same as the first 3 weeks and continued for the following 3 weeks as well as spring semester) (The seventh week for each semester is omitted since this week, midterm exam is performed in all departments at the university.)
Week 10-11-12 (12 hours)	Teaching point: 6 prefixes, 4 roots, 4 suffixes with their meanings and exercises
Week 13-14 (8 hours)	Revision
Spring Semester	
Week 1-2-3 (12hours)	Teaching point: 5 prefixes, 5 roots, 4 suffixes with their meanings and exercises
Week 4-5-6 (12hours)	Teaching point: 5 prefixes, 5 roots, 4 suffixes with their meanings and exercises
Week 8-9-10 (12hours)	Teaching point: 6 prefixes, 4 roots, 3 suffixes with their meanings and exercises
Week 11-12 (8 hours)	Revision and Follow-up Activities
Week 13-14	Post-test for MCT and RCT

Data Analysis

The results of the study were analysed with independent sample t-test from the parametric test group. The reason for applying T-Test was that all participants' responses were included in the analysis and the normal distribution requirement was sought. Since t-test can be used when a researcher wants to determine "if the means of two groups are significantly different from one another" (Mackey & Gass, 2005: 272) as in the present study, it was seen as appropriate when comparing two groups (experimental and control). SPSS (version 25) software program was used in the analysis of the study. Outliers were excluded when they are shorter than 1000 ms. and slower than 8000 ms. for MCT. The mean RTs were calculated, and morphological instruction effect on EFL learners' morphological and metalinguistic awareness was investigated.

In addition to T-test, both research questions were re-analysed with ANCOVA (Analysis of Covariance) to make the study results more reliable. In a study, covariance analysis can be defined as a technique that enables the statistical control of another variable or variables named as a common variable, whose effect is related to the dependent variable other than the tested independent variable. The covariance analysis is generally used to test whether there is a significant difference between the pre-test and post-test control group patterns and the post-test measurements of the experimental and control groups. Here, pre-test measurements are defined as common variables (Büyüköztürk, 1998). The logic of covariance analysis is to extract the changes from the dependent variable, the common variable, and then find out whether the change in the dependent variable is caused by the independent variable. From this perspective, ANCOVA is the most common way to control a variable in analysis, ie to eliminate its effect (Punch, 2005) and considered ideal and powerful statistic for experimental studies (Mackey & Gass, 2005). In this study, it was used to examine the effects of morphological treatment on post-test scores (the dependent variable) of morphological correction and reading comprehension ability (i.e., the main factor with two levels: experimental and control group). All final models are available at https://drive.google.com/drive/folders/1ofdziYeepP7s0oZewdpK823vVihbkVi9?usp=sharing.

Results

Morphological Correction Test (MCT)

The first research question concerned with whether morphological instruction improve EFL learners' morphological awareness in terms of MCT. In order to analyse the effect of instruction, the RT performance scores of pre-tests and post-tests of both groups were analysed with ANCOVA and also Independent sample t-test procedure. Descriptive statistics (mean and SDs) for all variables included in the study and independent sample t-test results at two different times (pre-test and post-test) and two treatments (experimental/control) are reported in Table 2. Independent sample t-test results demonstrated that before the treatment period, there were

no significant differences between scores of experimental and control groups [MCT (t (72) =-1.468, p=.147)]. ANCOVA of the MCT scores when the covariate is not included revealed no significant differences between groups, [MCT (F (1, 72) = 2.154, p=.147)]. Similarly, when checking out the homogeneity of regression, there is no significant effect between groups (Group*MCT PRE, F (1,70) = .147, p= .703)]. It is clear from the significance value that there are no differences in Pre-Testing of all tasks-between the experimental and control group.

Independent sample t-tests of post-test scores indicated a statistically significant difference between the experimental and control groups (MCT, (t (72) =-6.241, p=.000)]. When pre-test scores of all tasks are included in the model as a covariate, post-test scores of all tasks showed that the experimental group significantly outperformed the control group at the time of post-testing, [(MCT, F (1, 71) =37.200, p=.000)]. The partial eta-squared value was .344 for MCT indicating a large effect size. The results show that the experimental group outperformed the control group after treatment.

Table 5. Descriptive statistics and Independent Sample T-Test Results

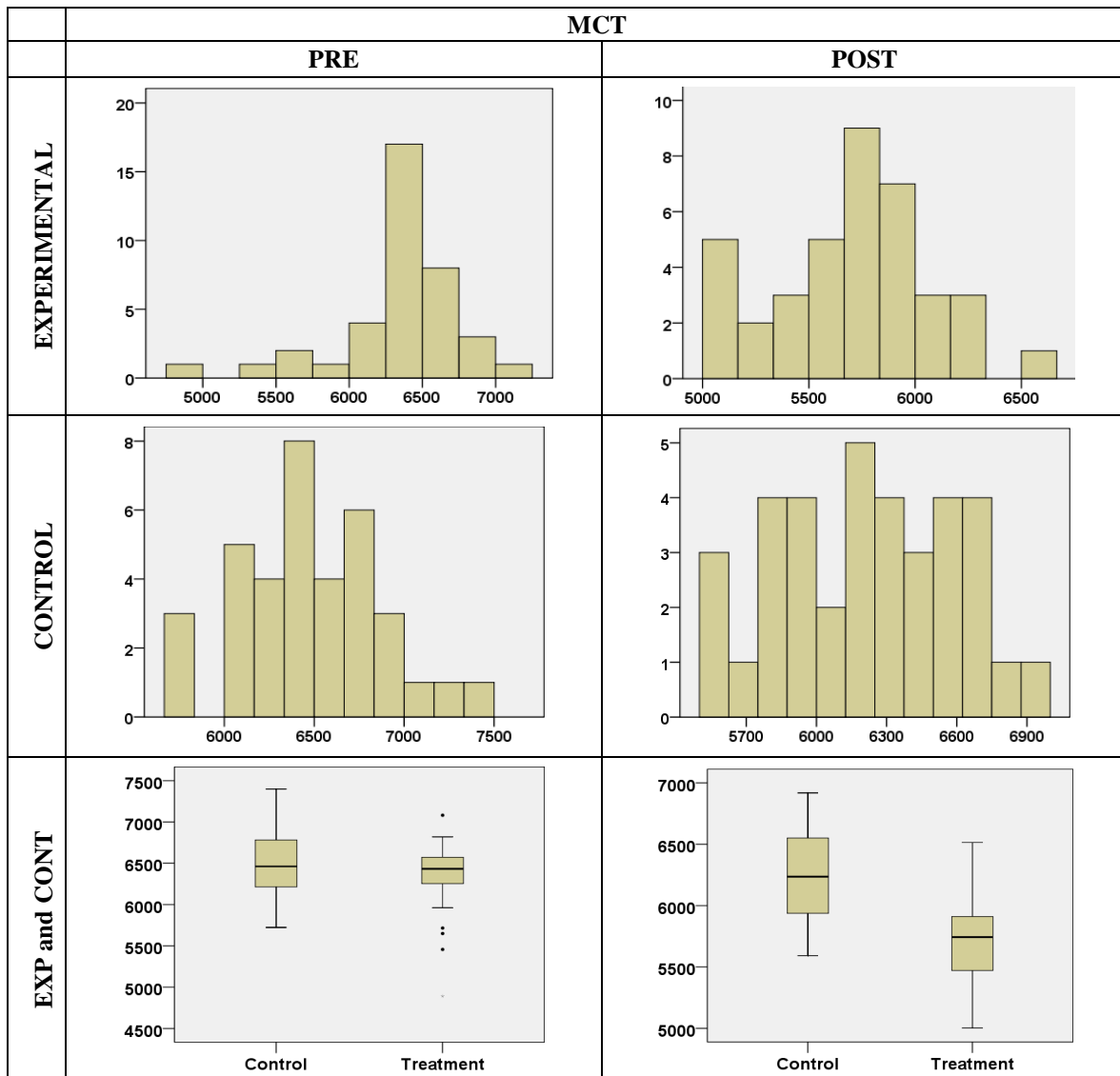|	Time	Treatment	N	Mean	SD	Min.	Max.	*t* (72)	*p*
MCT	Pre-test	Experimental	38	6352.802	406.067	4891.96	7082.12	-1.468	.147
		Control	36	6491.285	405.257	5723.10	7400.91		
	Post-test	Experimental	38	5695.902	361.312	5002.36	6514.27	-6 .241	.000
		Control	36	6229.774	374.482	5592.92	6917.85		

Figure 1. Experimental and Control Group's RTs on MCT

The histograms of pre-test and post-test scores showing the difference between experimental and control groups were displayed in Figure 1 comparatively. As seen in this figure, there is no significant difference between groups before the treatment. After the treatment, the experimental group had greater improvements compared to control group. Concerning the between-group factors, it shows the improvement of experimental group after the treatment. The RT means of experimental group are higher than the control groups' RT means.

Reading Comprehension Test (RCT)

The second research question of this study is related to the relationship between MA instruction and reading comprehension ability. In order to find out whether the MA treatment promotes reading comprehension ability, pre-test and post-test results of both groups were analysed.

Independent sample t-test scores, the mean and SDs for RCT at two different times (pre-test/post-test) and two treatments (experimental/control) are displayed in Table 3. As demonstrated in table, before the treatment, there was no significant difference between the groups [(t (72) =-.662, p=.51)]. ANCOVA of the RCT scores when the covariate is not included revealed no significant differences between groups, [F (1, 72) = .438, p=.510]. Similarly, when checking out the homogeneity of regression, there is no significant effect between groups [(Group*RCT PRE), F (1, 70) = 2.045, p= .157]. It is clear from the significance value that there are no differences in RCT-Pre-Testing between the experimental and control group.

Independent sample t-tests scores of RCT post-test indicated a statistically significant difference between the experimental and control groups [(t (72) =5.059, p=.000)]. When RCT pre-test score is included in the model as a covariate, RCT post-test scores showed that the experimental group significantly outperformed the control group at the time of post-testing, [F (1, 71) =29.449, p=.000]. The partial eta-squared value was .293 indicating a large effect size. The results show that the experimental group outperformed the control group after treatment.

Table 6. Descriptive statistics and Independent Sample T-Test Results

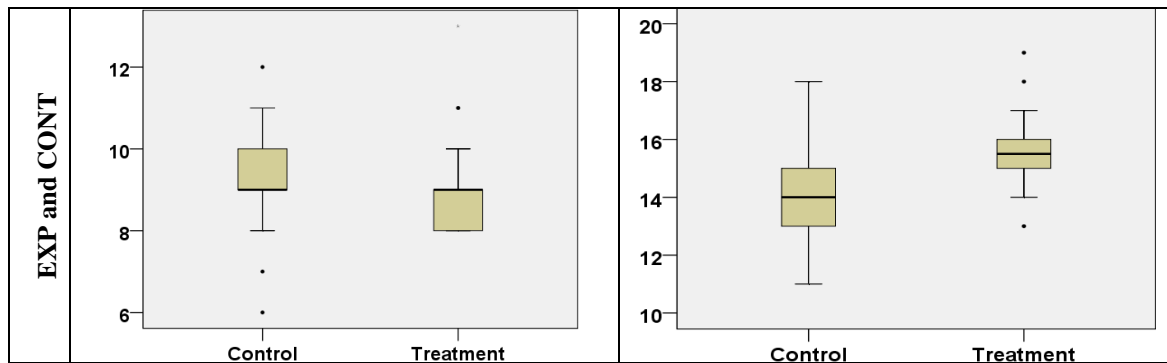|	Time	Treatment	N	Mean	SD	Min.	Max.	*t* (72)	*p*
RCT	Pre-test	Experimental	38	8.947	1.03838	8.00	13.00	-.662	.510
		Control	36	9.111	1.08963	6.00	12.00		
	Post-test	Experimental	38	15.552	1.26699	13.00	19.00	5.059	.000
		Control	36	14.000	1.37321	11.00	18.00		
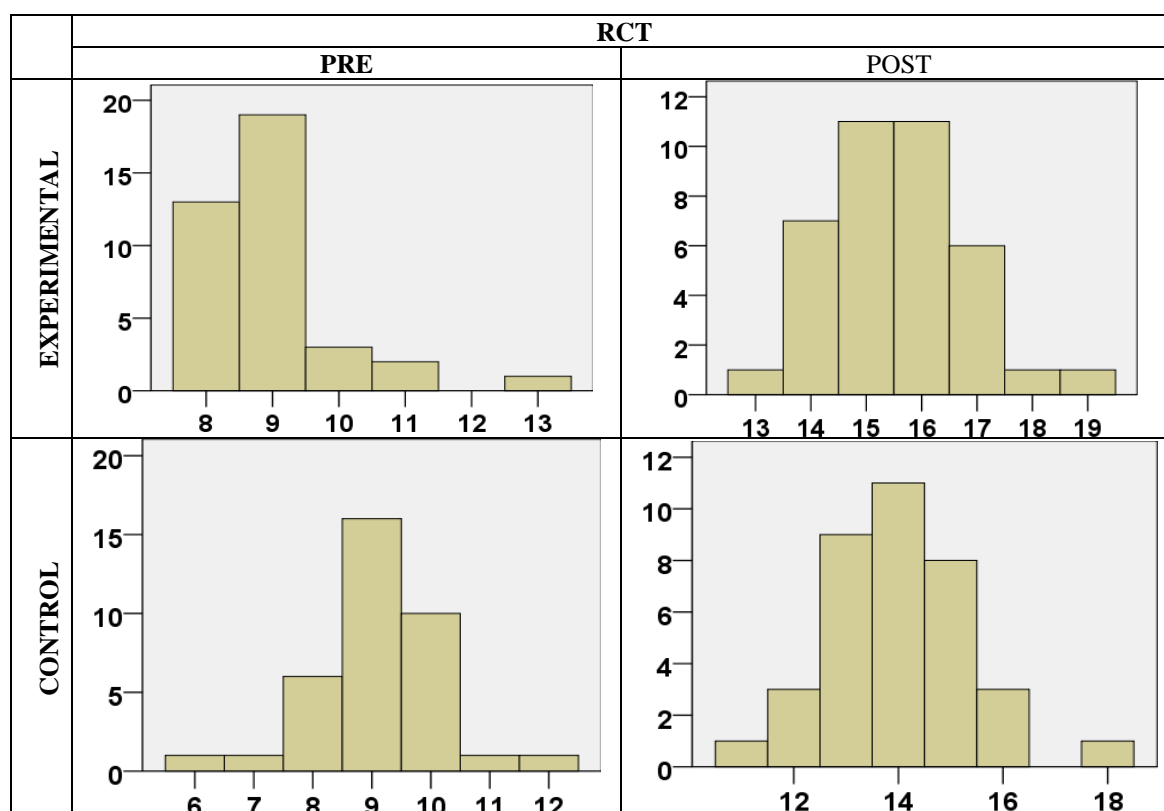
Figure 2. Experimental and Control Group's RTs on RCT

Figure 2 demonstrates the difference between experimental and control groups' performances comparatively. As seen in these figures, while there is no significant difference between groups before the treatment; after the treatment, the experimental group had greater improvements than control group in terms of accuracy.

Discussion and Conclusion

The purpose of the study was to examine whether or not morphological instruction plays an important role in explaining and understanding the difficulties and boundaries second language learners have while they are learning lexis in a new language and improving reading ability in this language. For this reason, the current study attempted to investigate the effect of morphological instruction on morphological awareness and reading comprehension. In total, 22-week teacher implemented intervention and treatment had positive effects on these two aspects mentioned when compared to the control group which took regular instruction during this period. Gaining further insight into this awareness will help us understand the mechanisms that influence reading words in another language. Specifically, this knowledge can help us understand and analyse the reading difficulties based on lexis that a large percentage of university students face and offer lots of possibilities to make the best decisions in the interventions programmed to foster their progress in second language vocabulary knowledge and reading. In other words, the main concern was to examine to what extent the morphological instruction affects learners' awareness on morphology and explains their difficulty in reading texts.

The first research question analysed the impact of morphological instruction on morphological awareness. According to the results, experimental groups outperformed the control groups in terms of RT means and correction performance. Another important result was that they benefited from the instruction period in a positive way. They need explicit teaching of morphological rules to improve their metalinguistic and morphological awareness. When considering *morphological correction task*, evidence from experimental groups who have decreasing level of response times showed that morphological instruction benefited in a higher level than control group. As Bowers, Kirby and Deacon (2010) indicated it is possible to say that morphological awareness which is gained by the support of explicit instruction contributes many students who are in typical instruction and fail in it. To sum up, the improvements of treatment group were significantly better than those of control groups.

Concerning the second research question, the general results of the study show that experimental groups significantly outperformed the control groups in reading comprehension as well. It also demonstrated that the explicit morphological instruction and teaching parts of speech had positive effects on reading comprehension ability. Most studies looked at the relationship between morphological awareness and reading comprehension with different participant groups but in a similar way to this study (e.g Brimo, 2016; Deacon & Kirby, 2004; Mahony, 1994; Kirby et al., 2012; Ouellette, 2006; Tyler & Nagy, 1990). The difference from the previous studies is that in this study, an effort was made to determine whether morphological treatment process was used to improve the reading comprehension of Turkish EFL learners. The reading performance of students on four different reading passages was used to see whether the experimental group outperform the control group in terms of the accuracy of comprehension or inferencing questions. Based on accuracy, the result was that experimental group completed the tasks more accurately than the other group. Thus, the comparable finding was that performance of experimental group after treatment significantly related to awareness of morphological structures. In terms of the relationship between morphological awareness and reading comprehension, both groups performed well; however, experimental group performed statistically significant on reading comprehension more than control group. Thus, their reading appears to have been affected by the nature of

morphological treatment and awareness improvement. In terms of reading comprehension, some studies (Levesque, Keiffer & Deacon, 2017; Mahony, 1994; McBride-Chang et al., 2003; Tong, Deacon, Kirby, Cain & Parrila, 2011; Treiman & Cassar, 1996) have shown some significant correlations between the improvement of sensation to morphology and reading achievement on different participants group. The results of the present study showed that awareness of morphology and reading vocabulary contributed significantly to comprehension at the text levels. The interrelation of different aspects or morphological awareness might be expected for university level students since they had more exposure to morphologically complex vocabulary items and more opportunity to learn to use these words in reading or writing skills. However, it is still surprising that, explicit morphological instruction improves their abilities greater than the others who does not take any explicit learning process. In general, when the results of the study are examined, it can be stated that the findings obtained that the metalinguistic and morphological awareness in Turkish EFL context improve reading and vocabulary skills after the training are similar to those obtained by Akbulut (2017). In terms of education, both studies can conclude that explicit teaching period has achieved a successful result on students. In terms of the development of metalinguistic awareness, the higher level of awareness of Turkish L2 learners shows the importance of second language acquisition, as in the case of Atar (2018). On the other hand, when the term morphological awareness is taken into consideration, the results of the study indicate that Turkish EFL students' performance on word recognition is successful and they become familiar with English word forms. Amirjalili and Jabbari (2018), who examined the results of the measurement tools applied after a long-term training on morphological awareness with participants who are learning English as a second language, stated that the participants showed a higher achievement in reading comprehension skills and these findings are in line with the findings of this study. These findings are thought to be beneficial for EFL instructors to emphasize that increasing second language learners' morphological and metalinguistic awareness skills may increase their reading comprehension skills as well. In particular, instructors should present the morphological aspects of the materials presented in the classroom in the second language vocabulary and reading classes and should not ignore the need to prepare materials in this direction.

All in all, this study has revealed some important improvements in terms of vocabulary and reading comprehension for Turkish EFL students and also brought some limitations and weaknesses with it. The real problem is that this study is limited to only one public university. Since the curriculum and teaching techniques of each university and even the instructor will be different, generalizing this study with all universities may be a problem. On the other hand, the limited educational process is another limitation of the study. Finally, in future studies, the measurement tools can be expanded and distributed to a few weeks to be completed at the end of the semester. In addition, the lack of follow-up measurement and the inability to measure the persistence of reading comprehension and awareness skills can be considered as another weakness or limitation of the study.

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Appendix A. Morphological Correction Test (MCT)

Read the sentences and decide whether the underlined word is in the correct form of the words given in brackets. If it is correct, push the button YES, if it is not correct, push the button NO.

1. There was an enormous <u>expansion</u> in aviation. (expand) YES/NO
2. Economists are concerned that development should be <u>sustainable</u> (sustain) YES/NO
3. There was no <u>perceptional</u> change in the patient's condition. (perceive) YES/NO
4. The group's aims include the <u>elimination</u> of poverty. (eliminate) YES/NO
5. He was sitting <u>comfortably</u> in his seat on the train. (comfort) YES/NO
6. There was a <u>greeny</u> light coming from the window. (green) YES/NO
7. He was acting in a very <u>childy</u> way. (child) YES/NO
8. Some of the shanty towns are dreadfully <u>crowded</u>. (crowd) YES/NO
9. The team were able to win the <u>champion</u>. (champion) YES/NO
10. The analysis demanded an <u>exceeding</u> amount of computer time. (exceed) YES/NO
11. The course requires a <u>reasonable</u> amount of computer knowledge. (reason) YES/NO
12. I couldn't find any <u>weakness</u> in his theory. (weak) YES/NO
13. He needed to <u>regulate</u> the temperature for health. (regular) YES/NO
14. There was a three-hour <u>stop</u> because of strike. (stop) YES/NO
15. She looked at her <u>reflected</u> in the mirror. (reflect) YES/NO
16. He decided to study <u>journalism</u> at university. (journal) YES/NO
17. The film was <u>surprisingly</u> good, we enjoyed it. (surprise) YES/NO
18. I don't like him since he's so <u>unsatisfied</u>. (satisfy) YES/NO
19. The new company has over five hundred <u>employees</u>. (employ) YES/NO
20. The new manager was very efficient and <u>businessman</u>. (business) YES/NO
21. The rate of <u>employment</u> in Turkey has been rising. (employ) YES/NO
22. She looked at him <u>happily</u> and started to cry. (happy) YES/NO
23. The party was <u>disastrous,</u> everything went wrong. (disaster) YES/NO
24. The film was so <u>boring</u> that we left it. (bore) YES/NO
25. The film was terrible, I felt really <u>boring</u>. (bore) YES/NO
26. Have you seen that new <u>comedian</u>? He's funny. (comedy) YES/NO
27. The event was totally <u>organised</u>. It was terrible. (organise) YES/NO
28. I arrived late for work because I was <u>slept</u>. (sleep) YES/NO
29. There is a small <u>booking</u> explaining the holiday. (book) YES/NO
30. He was <u>compromised</u>. He wouldn't change his mind. (compromise) YES/NO

Appendix B. Reading Comprehension Test (RCT)

Passage 1.

(1) Rachel Louise Carson received her degrees in marine biology from the Pennsylvania College for Women and in zoology from the Johns Hopkins University. Her true calling turned out to be much broader in range than the academic study of wildlife, however. As Carson's career as a scientific writer progressed, she became interested in the effects of artificial chemicals on the natural environment. She is thus regarded as the public figure who <u>launched</u> the environmentalist movement.

(2) Upon enrolling in college, Carson had initially intended to major in English and become a journalist or novelist. Her attentiveness to presentation allowed her to convey even rather dry facts in an evocative prose style that held the attention of the general reader. Wedded to her extensive academic training in biology, Carson's talent for expressive writing positioned her ideally to bring scientific findings about ecology to a mass audience. She published a famous trilogy about the delicate and complex ecology of the sea, beginning with Under the Sea-Wind. That first volume took a largescale approach, describing the living systems of the ocean in everyday, easily understood terms. Under the Sea-Wind was only a moderate commercial success, but it, along with Carson's writings for the United States Fish and Wildlife Service, set the stage for her second volume, published ten years after the first. In it, Carson examined more explicitly than before the effects of human action on the creatures of the ocean. The last book in the trilogy was The Edge of the Sea, in which Carson trained her writerly and scientific gaze on the shoreline of the East Coast to examine the endangered organisms that populated it.

(3) Carson alleged that the regulations governing use of these chemicals were inadequate, though her positions were not as extreme as they are sometimes now characterized. She did not support the outright banning of pesticides. _____, she objected to "indiscriminate" use, which is to say, use without any thought for caution and moderation. Eventually, Carson's views were taken seriously at the highest levels of government. President John F. Kennedy's Science Advisory Committee solicited her advice on how to improve rules about pesticide use. She also testified before Congress. Through her influence, she assisted in bringing about far stricture

controls on toxic chemicals such as DDT, which deteriorates slowly and thus remains in soil and groundwater for very long periods of time.

1. The underlined word "launched" in the paragraph 1 is closest in meaning to
A. wrote about   B. reorganized   C. began   D. researched

2. It can be inferred from the passage that DDT is especially dangerous because
A. it is most commonly used pesticide   B. its taste attracts birds
C. It does not disappear quickly   D. It takes a long time to kill insects

3. What did Rachel identify in her first volume?
A. Living systems of the ocean   B. Organisms in the sea
C. Shoreline of the East coast   D. Pesticide use in nature

4. Which word fits in the blank in paragraph 3.?
A. Besides   B. Finally   C. Rather   D. Likewise

5. The best title of the passage is
A. Politics of Pollution   B. Feminism of Science
C. The Ocean in Danger   D. The First Environmentalist: Rachel Carson

Passage 2

(1) The flag, the most common symbol of national identity in the modern world, is also one of the most ancient. The traditional flag of fabric is still used to mark buildings, ships, and diplomatic caravans by national affiliation, but its visual design makes it adaptable for other roles as well. Most flags have a compact, rectangular shape and distinct visual symbolism. Their strong colours and geometric patterns are usually instantly recognizable even if miniaturized to less than a square centimetre. Images of flags can thus serve as identifying icons on airliners, television broadcasts, and computer displays.

(2) Despite its simplicity, the national flag as we know it today is in no way a primitive artefact. It is, rather, the product of millennia of development in many corners of the globe. Historians believe it had two major ancestors, of which the earlier served to indicate wind direction. Early human societies used very fragile shelters and boats. Their food sources were similarly vulnerable to disruption. Even after various grains had been domesticated, people needed cooperation from the elements to assure good harvest. For all these reasons, they feared and depended on the power of the wind, which could bring warmth from one direction and cold from another.

(3) In Europe, the Chinese-derived flag met up with the modern flag's second ancestor, the heraldic crest. The flags used in Asia may have been differentiated by colour, but they rarely featured emblems or pictures. European nobles of the medieval period had, _____, developed a system of crests (symbols or insignias specific to particular families) that were commonly mounted on hard surfaces; shields to be used in battle often displayed them especially prominently.

(4) The production of these crests on flags permitted them to be used as heralds, meaning that they functioned as visual announcements that a member of an important household was present. While crests began to appear on flags as well as shields, the number of prominent families was also increasing. They required an ever-greater number of combinations of stripes, crosses, flowers, and mythical animals to distinguish themselves. These survived as the basic components of flag design when small regional kingdoms were later combined into larger nation-states. They remain such for many European countries today. (374)

6. The underlined word "miniaturized" in paragraph 1 is closest in meaning to
A. publicized   B. coloured   C. made brighter   D. made smaller

7. The underlined word "they" in paragraph 2 refers to
A. grains   B. people   C. elements   D. harvests

8. Which word fits in the blank in paragraph 3?
A. however   B. nevertheless   C. furthermore   D. similarly

9. According to paragraph 4 of the passage, the number of flag designs increased because
A. fewer shields were being made for battle   B. nation-states were becoming larger
C. artists had greater freedom in creating flags   D. more families wanted their own symbols

10. The best title of the passage is
A. National Identity Symbol: The Flag   B. The Flag and Its Alteration
C. The Usage of National Flag   D. The Production of Flags

Passage 3.

Part 1.

(1) Although it seems like the proliferation of spam—junk E-mails sent unsolicited to millions of people each day—is a recent problem, spam has been around as long as the internet has. In fact, the first documented case of spam occurred in 1978, when a computer company sent out 400 E-mails via the Arpanet, the precursor to the modern Internet. Now, spam E-mails account for more than two-thirds of all the E-mail sent over the internet, and for some unlucky users, spam makes up 80 percent of the messages they receive. And, despite technological

innovations such as spam filters and even new legislation designed to combat spam, the problem will not go away easily.

(2) The reason spammers (the people and businesses that spread spam) are difficult to stop is that spam is so cost-effective. It costs a spammer roughly one hundredth of a cent to send spam, which means that a spammer can still make a profit even with an abysmally low response rate, as low as one sale per 100,000 E-mails sent. This low rate gives spammers a tremendous incentive to continue sending out millions and millions of E-mails, even if the average person never purchases anything from them. With so much at stake, spammers have gone to great lengths to avoid or defeat spam blockers and fillers.

(3) Most spam filters rely on a fairly primitive "fingerprinting" system. In this system, a program analyses several typical spam messages and identifies common features in them. Any arriving E-mails that match these features are deleted. But the fingerprinting defence proves quite easy for spammers to defeat. To confuse <u>the program,</u> a spammer simply must include a series of random characters or numbers. These additions to the spam message change its "fingerprint" and thus allow the spam to escape detection. And when programmers modify the fingerprint software to look for random strings of letters, spammers respond by including non-random content, such as sports scores or stock prices, which again defeats the system. (333)

11. According to the first paragraph, what is the main problem of today's technological world?
A. people face unwanted mails
B. people come across with spam messages if internet has
C. people waste their time on the internet
D. people are more unsocial than before

12. Why are the spammers encouraged to send spams?
A. they earn money and make a profit even from a low rate of spams
B. they like doing illegal things on the internet
C. they enjoy their time sending spams via e-mails
D. they are eager to prepare new programs including spams

13. What is the fingerprinting system?
A. a program analysing fingerprints of spammers
B. a system identifying features of spams
C. a program defining spam messages and their features
D. a system describing spam threats

14. The underlined phrase "The program" in paragraph 3 refers to
A. spam messages
B. random characters and numbers
C. a type of spam filter
D. common features

15. The best title for this passage (Part 1.) is
A. Internet Security
B. Solutions to Spam
C. Why is Spam Profitable
D. The Problems of Spam

Part 2.

(1) Understanding that spam is a very dangerous and harmful for every budget, software developers are trying to find new solutions for spam. Unlike from fingerprinting systems, another possible solution takes advantage of a computer's limited learning abilities. So-called "smart filters" use complex algorithms, which allow them to recognize new versions of spam messages. These filters may be initially fooled by random characters or bogus content, but they soon learn to identify these features. _____, spammers have learned how to avoid these smart filters as well. The smart filter functions by looking for words and phrases that are normally used in a spam message, but spammers have learned to hide words and phrases by using numbers or other characters to stand in for letters. For example, the word "money" might appear with a zero replacing the letter "o." Alternatively, spammers send their messages in the form of a picture or graphic, which cannot be scanned in the same way a message can.

(2) Another spam stopper uses a proof system. With this system, a user must first verify that he or she is a person before the E-mail is sent by solving a simple puzzle or answering a question. This system prevents <u>automated</u> spam systems from sending out mass E-mails since computers are often unable to pass the verification tests. With a proof system in place, spam no longer becomes cost-effective because each E-mail would have to be individually verified by a person before it could be sent. So far, spammers have been unable to defeat proof systems, but most E-mail users are reluctant to adopt these systems because they make sending E-mails inconvenient. A similar problem prevents another effective spam blocker from widespread use. This system involves charging a minimal fee for each E-mail sent. The fee, set at one penny, would appear as an electronic check included with the E-mail. Users can choose to waive the fee if the E-mail is from a legitimate source; however, users can collect the fee from a spammer. A fee system would most likely eliminate a great deal of spam, but unfortunately many users find such a system too intrusive and inconvenient.

(3) In some ways, the battles being fought over intrusive E-mails are very much an arms race. Computer engineers will continue to devise new and more sophisticated ways of blocking spam, while spammers will respond with innovations of <u>their</u> own. It is unfortunate that the casualties in this technological war will be average E-mail users.

16. Which word fits in the blank in paragraph 1?
A. Unfortunately   B. Otherwise   C. Finally   D. Indeed

17. The underlined word "automated" in paragraph 2 most nearly means
A. computerized   B. authorized   C. ineffectiveness   D. violation of privacy
18. In paragraph 3, the author implies that
A. Though spamming will continue, it will be only a minor inconvenience.
B. E-mail users suffer the greatest costs from the fight over spam.
C. It is only a matter of time before a permanent solution to spam is found.
D. Spam will become an increasingly serious threat to communication by email.
19. What does "their" refer to in the paragraph 3.?
A. e-mails   B. computer engineers   C. spammers   D. e-mail users
20. The best title of the passage (Part 2.) is
A. Internet Security   B. Solutions to Spam
C. Why is Spam Profitable   D. The Problems of Spam