

## The Effects of Vocabulary Exercises on EFL Vocabulary Learning and Retention

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This study investigates the effects of written vocabulary exercises on lexical knowledge. Korean university students learning English as a foreign language were randomly assigned to one of four conditions-Condition 1 (having students match word form with word meaning), Condition 2 (having students fill in the blank provided with a list of words), Condition 3 (having students write sentences with the target words), Condition 4 (having students do three practices with the same vocabulary exercise as the condition 1). Each type of exercises in Condition 1, 2, and 3 was designed to classify a different level of mental processing except Condition 4 with multiple encounters of the target words. Learners' vocabulary knowledge of this study was obtained using a format adopted from the Vocabulary Knowledge Scale (VKS) immediately and two weeks later. The findings indicated that: (1) Condition 4 having students do three matching vocabulary exercises was as effective as the condition 3 (one writing exercise) on the immediate learning of word; (2) although there was no significant difference of the effect of vocabulary exercises between Condition 3 and 4, Condition 4 asking students to do three matching vocabulary exercises was the most effective way of vocabulary retention after two weeks.

[EFL vocabulary learning/L2/retention]

### I. INTRODUCTION

It has been noted by foreign language teachers and learners that vocabulary is the key to language learning as it plays a critical role in all of reading, writing, speaking, and listening. There is substantial amount of research that supports vocabulary knowledge as an important factor determining the ability to read in L2 (Huckin & Bloch, 1993; Haynes & Baker, 1993; Lafer & Sim, 1985). Likewise, many studies have shown the relationship

between a large L2 vocabulary and the writing skills (Laufer & Nation, 1995; Laufer, 1998) and in listening and speaking tasks (Joe, 1995; Joe, Nation, & Newton, 1996; Newton, 1995). In addition, Park, Lee, and Kang (2005) notes that the lack of vocabulary is the greatest reason why a lot of people learning a foreign language have difficulty in understanding and speaking in that language. Thus, improving proficiency in a foreign or second language to intermediate and advanced levels of proficiency inevitably involves building the knowledge of words (Hulstijn & Laufer, 2001).

As shown above, it is important for language learners to have large numbers of words in learning a language. Nevertheless, the teaching and learning of vocabulary have been undervalued in the field of second language acquisition over the past five decades (Cho, 1996). In recent years, a number of studies for language acquisition have been interested in vocabulary learning and teaching as a result of the development of communicative approach to language teaching. Vermeer (1992) stated that having an adequate and appropriate vocabulary is more important than knowing grammatical rules for effective communication. Coady and Huckin (1997) added that lexical competence is a critical element in the development of communicative competence.

The quantity of studies have investigated incidental versus direct vocabulary learning, vocabulary learning strategies, lexical requirements for different levels of comprehension, receptive and productive vocabulary knowledge, and testing vocabulary knowledge (Nation, 1999). Even though a growing number of L2 research have studied L2 lexical acquisition, only a limited amount of research has focused specifically on L2 lexical acquisition from the cognitively oriented branch of L2 vocabulary research. Bialystok (2000) and Segalowitz (2000) have suggested the need for greater cross-disciplinary interaction between applied linguistics and psychology with respect to many issues in language acquisition.

The present study was oriented within one cognitively oriented branch of L2 vocabulary research, comparing the effects of different vocabulary exercises associated with different depth of processing during the initial stages of learning new L2 words. EFL learners not having target language speaking environment often learn new words in L2 classroom through teachers' instruction and classroom activities with textbooks which contain various exercises. In this sense, investigating the efficiency of vocabulary exercises is needed to develop vocabulary knowledge in relatively limited amount of target language exposure situation.

Two important studies were carried out to present independent standards by which different processing tasks can be ordered along with the depth continuum. Stahl (1985) suggested a scale representing three broad levels of processing required by vocabulary instruction task. Paribakht and Wesche (1996, 1997) and Wesche and Paribakht (1999) also classified text-based vocabulary enhancement exercises into several groups and found the effectiveness of the vocabulary exercises on vocabulary retention. Furthermore, a few

attempts to compare the effectiveness of each vocabulary exercise for vocabulary acquisition have made recently by Hulstijn and Laufer (2001), Cho (2002) and Folse (1999).

Some cognitive scientists have suspected 'depth' effect in learning might not have resulted from the deeper level of processing required by the task but the amount of processing time. Though, in the treatment, all groups were given the same amount of time (10 minutes) to complete their tasks, writing exercises took longer than the other exercises (matching and fill-in-the-blank) to carry out. In general, tasks demanding deep processing take more time to conduct. Thus, Condition 4 was included to introduce whether several tasks with shallower level of processing are as effective as one task with the deepest level of processing when the time was controlled.

This study focusing on how learners respond to different vocabulary exercises will contribute to support a psychological theory and provide some insight for L2 researchers, instructors, textbook publishers, and learners. To investigate the efficiency of vocabulary exercises which are commonly used in L2 classroom, the following set of research questions were raised:

- (1) Which condition of vocabulary exercises is most effective on new L2 lexical learning?
- (2) Is there any difference in the effects of vocabulary exercises between immediate and delayed posttests?

## II. REVIEW OF THE LITERATURE

Learning vocabulary is one of the most difficult tasks in various aspects of language learning. Many English teachers have been disappointed about poor retention of lexical items and they recognize that learners forget material. This forgetting is a natural fact of learning until the word is mastered (Schmitt, 2000). While a single exposure of experience may lead to learning, the acquisition of new information is closely related to review and practice.

How many and what kinds of exposures to a word does the learner need to acquire successfully? Before a student really "knows" a word, Underwood and Schulz (1960) indicated that perhaps ten to twenty exposures are needed. Kachroo (1962) found that most learners have known the words repeated seven times or more. Likewise, Crothers and Suppes (1967)'s vocabulary learning experiments were found that most items were learned after six or seven repetitions. However, Tinkham (1993) reported results that learners differed greatly in the time and number of repetitions required for learning. The results showed that repetition is only one of a number of factors affecting vocabulary learning and

exact numbers are different according to such variables as learner ability, learner motivation, and word difficulty. While several researchers try to present the adequate number of lexical repetition, it is not easy to fix on a particular number of repetitions needed for acquisition.

In general, learning is better when practice is distributed rather than massed. Though learners spend the same time in total on the study of the words to practice, massed repetition involves giving repeated attention to a word during a continuous period time but spaced repetition involves spreading the repetitions across a long period of time. The finding in memory research (Baddeley, 1990) and second language vocabulary learning research (Dempster, 1987) also reported that spaced repetition results in better learning than massed repetition.

Learning from repetition not only depends on the spacing of the repetitions but also on the nature of the repetition. Stahl and Fairbanks (1986) in a meta-analysis of vocabulary studies found similar results that more elaborative repetition such as extending the meaning of the word and encountering some of its collocations had stronger effects on passage comprehension measures than repetition of the same information. To explore the structure and the process of the memory system, memory research has been conducted. The most characteristic and influential of these is the modal model proposed by Atkinson and Shiffrin (1968). While the Atkinson and Shiffrin' model has explanatory power and clarity, it has been criticized because it oversimplifies the process and structure of long-term store and the effect of learning and processing on memory.

To better account for the process of memory, the levels-of-processing was originally proposed by Craik and Lockhart (1972). They suggested that retention of information is more dependent on the levels of processing. That is, the probability of retention is determined by the amount of processing that an item has received not by hypothetical memory structures such as the long- and short-term store. Moreover, they proposed two different rehearsal processes. One type of rehearsal is a maintenance rehearsal serving the function of maintaining a memory image; the other is an elaborative rehearsal involving deeper or more extensive processing of the material and increasing the chances of retrieval at a later time. Craik and Lockhart's the basic levels of processing hypothesis have had considerable influence, so experimental psychologists have investigated the notion of levels of processing as an indicator of how well information is retained.

Deeper-level rehearsal can include a wide variety of learning activities and these deeper-level activities are generally associated with a semantic character. The original formulation of depth of processing was concerned with whether or not semantic information was used and retention results more from depth of analysis than from number or length of repetitions. The basic principles of levels of processing have been studied mainly in list learning about the memorization of already known items. However, levels of processing principles could

be applied to learning new information, either in studying (T. H. Anderson & Armbruster, 1982), or in vocabulary instruction (Stratton & Nacke, 1974).

Although the levels of processing theory provided a broad framework within which memory research is done, it has been also criticized on its oversimplification of levels and not providing an operational measure of how deep or shallow the processing by Eysenck (1979) and Nelson (1977). Consequently, various modifications and refinement were proposed.

While it is hard to operationalize and define “depth”, it is generally accepted that elaborateness of encoding and distinctiveness of trace are the key for long-term recall (Matlin, 1989). Elaboration refers to the amount of processing or cognitive efforts while encoding. In addition to the existence of the depth-of-processing, the ideas of encoding richness or elaboration, the richness are critical factors for long term retention. Craik and Tulving (1975) also accepted these criticisms of the levels of processing framework and the original formulation was changed into stressing semantic elaboration. Semantic elaboration means a situation in which one focuses on the semantic property of a word and structural elaboration means a situation in which one focuses on the structural or formal properties of a word (Barcroft, 2000). Anderson and Reder (1979) suggested that elaboration is the only concept necessary because the levels of processing simply give greater scope for elaborative process. Craik and Tulving (1975)’s experiment with a word and a sentence supported that elaboration or more cognitive efforts with complex sentences helped subjects recall more words.

The LOP theory has inspired the development of imagery based mnemonic vocabulary learning techniques, such as Keyword. Most studies on semantic elaboration with the use of mnemonics have shown that memory for new words increased (Levin, McCormick, Miller, Berry, & Pressley, 1982; Pressley, Levin, & Miller, 1982; Atkinson & Raugh, 1975). Without the use of mnemonics, the effects of semantic elaboration on lexical acquisition have mixed findings. The study conducted by Coomber, Ramstad, and Sheet (1986) have found positive effect for nonmnemonic semantic elaboration on lexical acquisition. However, null effects also have been reported (Levin et al., 1982; Pressley et al., 1982) and others have found negative effects (McDaniel & Kearney, 1984; Barcroft, 2000). Moreover, some researchers suggest that the effects of semantic elaboration depend on the nature of the task during study and testing phases (Morris, Bransford, & Franks 1977; Moeser, 1983; McDaniel & Kearney, 1984).

As we have seen, the concepts of deep processing or elaboration are hard to formalize and operationalize. However, the notions of depth of processing (Craik & Lockhart, 1972) and elaboration (Craik & Tulving, 1975) are still important. Thus some researchers attempted to establish and systematize the vague subjective notion of level of processing

and present independent standards by which different processing tasks can be ordered along with the depth continuum.

First, Stahl (1985) suggested a scale representing three different levels of processing for vocabulary instructional programs. According to three successively deeper levels of processing, the comprehension processing will lead to larger effects than association processing. The deepest generation processing will lead to the largest effects. In addition, Stahl (1985) found that the effectiveness of tasks can be explained by the levels of processing from the method comparison studies he reviewed.

Second, Paribakht and Wesche (1996) offered a categorization of vocabulary exercises through a classification of the major types of vocabulary instructional exercises found in a survey of ESL textbooks for adults. Vocabulary exercises can be grouped into five categories, representing a hypothesized hierarchy of mental processing activity: selective attention, recognition, manipulation, interpretation, and production. Among the five categories, 'recognition,' 'interpretation,' and 'production' can be considered equivalents of 'association,' 'comprehension,' and 'generation' respectively in Stahl (1985)'s classification.

Finally, because of the needs to translate and operationalize the general cognitive notion 'depth' in terms of L2 vocabulary learning tasks, Hulstijn and Laufer (2001) developed the Involvement Load Hypothesis. It proposed a motivational-cognitive construct of involvement, consisting of three basic components: need, search, and evaluation. The basic contention of the Involvement Load Hypothesis is that retention of unfamiliar words is, generally, dependent upon the degree of involvement in processing these words.

Although Paribakht and Wesche (1996, 1997) discussed the classification of vocabulary exercises and the superiority of vocabulary exercises over reading multiple texts, a review of the literature indicates that there are a relatively small number of studies of the effect of vocabulary exercises. Some of the studies are conducted to examine whether the effectiveness of vocabulary exercises can be ordered according to the levels of processing (Cho, 2002) and with regard to the Involvement Load Hypothesis proposed by Laufer and Hulstijn (2001).

At a beginner's level of learning a second language, it may be sufficient for the learners to show that they understand L2 words by being able to match them with an equivalent word in their own language or with an L2 synonym. Certainly, many conventional vocabulary-test items are designed on this basis. However, knowing a word is not an all-or-nothing proposition, so it is necessary to measure the depth of vocabulary knowledge with more sensitive instrument recording partial knowledge. Moreover, as their L2 proficiency develops, learners need to know more about the words than only meaning when they are to use them in their own speech and writing. Consequently, it is also important to investigate the effects of vocabulary exercises regarding to the multiple aspects of word. In order to examine the different effect of the LOP theory, the present study used the modified

Vocabulary Knowledge Scale (VKS) developed and validated by Paribakht and Wesche (1993).

### **III. METHOD OF RESEARCH**

#### **1. Participants**

The participants in this study were 98 undergraduate students, all of whom were monolingual speakers of Korean and had been studying EFL more than six years.

Before the main experiment, classes had taken standardized English proficiency test, TOEIC to ensure that there were no significant differences in English proficiency. Four classes were randomly assigned one of four conditions.

#### **2. Materials and Instruments**

##### **1) Materials**

###### **(1) Vocabulary Exercise**

There were three types of vocabulary exercises and four conditions. Vocabulary Exercise Type 1 categorized as 'recognition' according to Paribakht and Wesche (1996) or 'association' according to Stahl (1985) appears in Condition 1 where the group was asked to match 10 target words with a list of definition. The definitions were provided in Korean. Vocabulary Exercise Type 2 categorized as 'interpretation' according to Paribakht and Wesche (1996) or 'comprehension' according to Stahl (1985) appears in Condition 2 where the group assigned this type of exercises was given 10 sentences for each word and was required to choose the number indicating an appropriate word to fill in the blank of a sentence. Vocabulary Exercise Type 3 categorized as 'production' according to Paribakht and Wesche (1996) or 'generation' according to Stahl (1985) appears in Condition 3 where the group assigned this type of exercises was required to write a sentence with each of ten new words. In Condition 4, the group was asked to do three practices with matching vocabulary exercise equally given in the condition 1. As a result of a pilot test, the number three chosen in Condition 4 was decided because similar students did approximately three practices of matching exercises while they did one writing exercise. The students were announced orally on how to do the exercises and the directions were given again in written Korean. No dictionaries or teachers help were allowed, and no feedback was offered.

## (2) Mini-Dictionary

In this study, input for the meaning of the words was provided by a mini-dictionary. The mini-dictionary was one page contained L1 (Korean) definitions and L2 (English) synonyms of ten target words. These words were arranged alphabetically and the definition was modified simply to make students understood easily.

## 2) Instruments

## (1) Pretest

A pretest on the forty words included distracting items was administered to assess the participants' vocabulary knowledge in English. The participants were asked to write the meaning of the words in Korean or in English. Even if they were not sure, they were requested to write anything they thought they knew. The ten items not known by all participants were selected for the target words.

## (2) Posttest

The participants were assigned to report their knowledge on each vocabulary by using the modified Vocabulary Knowledge Scale (VKS), an instrument developed by Paribakht & Wesche (1993). The reliability and the validity of the VKS have been established in a number of research studies by Wesche & Paribakht (1996) and Joe (1995, 1998). To estimate its reliability, Wesche and Paribakht administered the VKS to groups of students, and found a strong relationship (with correlations of 0.92 to 0.97) between the students.

**TABLE 1**  
**The Original Version of the VKS**

| Categories  | Scores      |
|---|-------------|
| 1. I don't remember having seen this word before.   | 1           |
| 2. I have seen this word before, but I don't know what it means.  | 2           |
| 3. I have seen this word before, and I <u>think</u> it means _____ .<br>(provide an English synonym or an L1 translation) | 2<br>3      |
| 4. I know this word. It means _____ .<br>(provide an English synonym or an L1 translation)                                | 2<br>3      |
| 5. I can use this word in a sentence. Write your sentence here:<br>_____ .<br>(If you do #5, be sure to do #4 also.)      | 3<br>4<br>5 |

Knowing a word is not an all-or-nothing proposition. The VKS seemed better for this study because it measures depth of knowledge. The kind of knowledge gain that one might



expect from a short exposure to the target words as in the present study needs more sensitive tool for recording partial knowledge.

In the original version of VKS, it has five levels of knowing a word scoring from one to five points. However, this modified version of the VKS in the current study was changed into three levels of knowing a word.

In the present study, two changes were made to the test instrument. Category 2 and 3 in the original version of the VKS were eliminated in the modified VKS. Both Category 2 and 3 were designed to measure students' self-reported perception information and not actual performance. Though the original VKS awarded students three points for saying that they think they know a given word but four points for saying that they know the word, this is a problem of some self-reporting scales. The category 3 (thinking that you know a word) and the category 4 (knowing that you know a word) may not measure actual vocabulary knowledge but a degree of individual certainty. Moreover, according to Laufer (1997), L2 learners frequently overestimate their knowledge of words. Thus, the current VKS was modified from a five-scale to a three-scale category by eliminating Category 2 and 3. The modified scales and scores of the VKS used in this study are as follows:

**TABLE 2**  
**The Modified Version of VKS**

| Categories  | Scores |
|---|--------|
| 1. I don't know what this word means.   | 0      |
| 2. I know this word. It means _____.<br>(provide an English synonym or an L1 translation) | 1      |
| 3. I can use this word in a sentence. Write your sentence here:<br>_____.                 | 2      |
| (If you do #2, be sure to do #3 also.)  | 3      |

Two posttests were administered to measure the immediate and delayed effects of the vocabulary exercises. The immediate test was conducted right after the treatment, and the delayed test was administered two weeks after the immediate test. The order of words in the vocabulary test was randomly changed to minimize the potential test effects of the previous assessment.

### 3. Target words

The ten experimental words in this study were selected according to the following criteria: (1) the participants would not have any knowledge of the target words; (2) the target words having L1 equivalent were chosen; (3) phrasal verbs or idioms were not included; (4) The meanings of the target words which could be inferred on the basis of

words, stems and affixes were eliminated; (5) the synonymous word pairs or word pairs whose meaning could be inferred from each other were not selected. The target items for the experiment were shown in table 3.

**TABLE 3**  
**List of Target words**

| Target words | explanation  |
|--------------|--|
| chary        | (Adjective) very cautious; slow to give  |
| Enmity       | (Noun) hatred or animosity   |
| Fervor       | (Noun). the passion or intensity of feeling or expression                      |
| Fret         | (Verb) To worry about something  |
| Loath        | (Verb) To dislike someone or something very much                               |
| Placid       | (Adjective) calm or serene   |
| Plummet      | (Verb) To fall straight down; to fall quickly, suddenly, and very hard. Pundit |
| Pundit       | (Noun) A learned person  |
| Squander     | (Verb) To waste; to use something in a bad way                                 |
| Tatty        | (Adjective) worn or shabby   |

#### 4. Procedure

This study consisted of a pretest, a learning session, and two posttests which included an immediate posttest and two week later delayed posttest. The procedures for each of four groups were identical. Within each class, the participants were randomly assigned to one of four conditions.

Data were collected in the participants' regular classroom according to the following procedures:

A week before the experiment, all of the participants were given ten minutes in a regular English class to complete the pretest. After the pretest, ten target words of which all participants did not demonstrate any knowledge were selected.

In the learning session, the experimental materials were distributed at the beginning of the learning session and were collected at the end of it. The participants were instructed to read the ten target words in the mini-dictionary at the first page, followed by the selected vocabulary exercises at the next page. Instructions on how to complete each treatment were written at the top of each page in both English and Korean. The available time for learning was ten minutes from the finding of pilot studies. The learners were told that they would be tested after the learning session but were not told the nature of the tests.

After the learning session, all classes were administered the posttests. Students were given as much as needed to finish a test. The participants were not told that a delayed posttest would be administered later on. This was intended to avoid encouraging relearning, which might lead to treatment confusion.

Two weeks later, the students took unexpected delayed posttests on the target words.

## 5. Data Scoring and Analysis

In the immediate and delayed vocabulary test, the score of the answered items ranged from 0 to 3 points. Thus the maximum score for the vocabulary tests was 30 points.

**TABLE 4**  
**Scores in the Vocabulary Test**

| Categories | Scores | Meaning of scores  |
|------------|--------|--|
| 1          | 0      | The word is not familiar at all.   |
| 2          | 1      | A correct synonym or translation is given.   |
| 3          | 2      | The word is used with semantic appropriateness in a sentence.                          |
|            | 3      | The word is used with semantic appropriateness and grammatical accuracy in a sentence. |

Although the sentences produced by students in vocabulary test have spelling errors of words other than the target words, they did not influence the scoring. In addition, grammatical errors of other words except the target words were not considered seriously if they did not prevent understanding the meaning of the target words.

For data analysis, the Statistical Packages for the Social Sciences (SPSS) window version was used. In order to answer the first research question, the mean score gain of each group was compared. Then, one-way ANOVA was conducted to examine any significant group differences. The independent variable was the type of vocabulary exercises, and the dependent variable was the score of each group. A one-way ANOVA was conducted for the word knowledge. Following the analysis, a post-hoc Tukey test was run to find out where the differences occurred. For the second research question, the same statistical method was used.

## IV. RESULT

### 1. The Effect of Vocabulary Exercise on the Immediate VKS

**TABLE 5**  
**Means and Standard Deviations of Immediate Vocabulary Posttest Score**

| Conditions          | <i>n</i> | <i>M</i> | <i>SD</i> |
|---------------------|----------|----------|-----------|
| 1 (1 matching)      | 28       | 13.34    | 8.161     |
| 2 (multiple-choice) | 25       | 14.12    | 8.440     |
| 3 (writing)         | 23       | 24.50    | 4.772     |
| 4 (3 matching)      | 22       | 23.85    | 5.369     |

As shown in Table 5, among the conditions, the participants in Condition 3 had the highest score (mean= 24.50). As the means of the five conditions appeared to be different each other, one-way ANOVA was conducted in order to test for a statistically significant difference between four groups.

**TABLE 6**  
**ANOVA Summary Table for Immediate Vocabulary Posttest score**

| Source    | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|-----------|-----------|-----------|-----------|----------|----------|
| Condition | 9         | 7037.071  | 781.897   | 13.881   | .000**   |
| Error     | 213       | 11998.317 | 56.330    |          |          |
| Total     | 223       | 83312.500 |           |          |          |

\*\*  $p < .01$

As indicated in Table 6, the result of the analysis showed that the five groups differed significantly with an alpha .01 level ( $F(9,213) = 13.881, p = .00$ ). Thus, it was suggested that there was a significant difference across the participants of five conditions, rejecting the null hypothesis that there are no differences among the groups. In order to check exactly where the significant difference lay, the Post-hoc Tukey test was performed.

**TABLE 7**  
**Pairwise Comparison of Exercise Types on Immediate Vocabulary Posttest Score**

| Source            | Mean difference | <i>p</i> |
|-------------------|-----------------|----------|
| Condition 1 vs. 2 | .781            | 1.000    |
| Condition 1 vs. 3 | 11.16           | .000**   |
| Condition 1 vs. 4 | 10.509          | .000**   |
| Condition 2 vs. 3 | 10.380          | .001**   |
| Condition 2 vs. 4 | 9.728           | .000**   |
| Condition 3 vs. 4 | .652            | 1.000    |

\*\*  $p < .01$

From Table 7, the significant difference occurred between Condition 1 and Condition 3 ( $p < .01$ ). In addition, there was a significant difference between the mean score of Condition 1 and Condition 4 and that of Condition 2 and 3 and that of Condition 2 and 4. ( $p < .01$ ) However, the difference between the mean score of Condition 1 and Condition 2 and that of Condition 3 and Condition 4 was not statistically significant. In the immediate meaning test, Condition 3 and 4 performed significantly better than Condition 1 and 2.

## 2. The Effect of Vocabulary Exercise on the delayed VKS

**TABLE 8**  
Means and Standard Deviations of Delayed Vocabulary Posttest Score

| Conditions          | <i>n</i> | <i>M</i> | <i>SD</i> |
|---------------------|----------|----------|-----------|
| 1 (1 matching )     | 28       | 6.60     | 6.456     |
| 2 (multiple-choice) | 25       | 9.10     | 8.002     |
| 3 (writing)         | 23       | 11.41    | 8.281     |
| 4 (3 matching )     | 22       | 14.94    | 10.054    |

As shown in Table 8, among Conditions, the participants in Condition 4 had the highest score (mean= 14.94). As the means of the four conditions appeared to be different each other, one-way ANOVA was conducted in order to test for a statistically significant difference between four groups.

**TABLE 9**  
ANOVA Summary Table for Delayed Meaning Vocabulary Posttest Score

| Source    | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|-----------|-----------|-----------|-----------|----------|----------|
| Condition | 9         | 4093.056  | 454.784   | 8.456    | .000**   |
| Error     | 191       | 10272.954 | 53.785    |          |          |
| Total     | 201       | 31624.250 |           |          |          |

\*\*  $p < .01$

As indicated in Table 9, the result of the analysis showed that the four groups differed significantly with an alpha .01 level ( $F(9,191) = 8.46, p = .00$ ). Thus, it was suggested that there was a significant difference across the participants of four conditions. In order to check exactly where the significant difference lay, the Post-hoc Tukey test was performed.

**TABLE 10**  
Pairwise Comparison of Exercise Types on Delayed Vocabulary Posttest Score

| Source            | Mean difference | <i>p</i> |
|-------------------|-----------------|----------|
| Condition 1 vs. 2 | 2.49            | .973     |
| Condition 1 vs. 3 | 4.81            | .429     |
| Condition 1 vs. 4 | 10.71           | .000**   |
| Condition 2 vs. 3 | 2.31            | .985     |
| Condition 2 vs. 4 | 8.22            | .006**   |
| Condition 3 vs. 4 | 5.91            | .181     |

\*\*  $p < .01$

From Table 10, the significant difference occurred between Condition 1 and Condition 4 ( $p < .01$ ) as well as between Condition 2 and 4 ( $p < .01$ ). However, the difference between the mean score of Condition 1 and Condition 2 and that of Condition 1 and Condition 3

and that of Condition 2 and Condition 3 and that of Condition 3 and 4 was not statistically significant.

## V. DISCUSSION

### 1. The Effect of Vocabulary Exercise on the Immediate VKS

The purpose of this study was to examine the effect of four written practice conditions varying levels of mental processing on the learning and the retention of new L2 vocabulary. Condition 1 required students to match ten target words with their ten definitions. Condition 2 required students to choose the number indicating an appropriate word to fill in the blank of a sentence. Condition 3 required students to write a sentence with each of ten new words. Condition 4 required students to do three practice sheets from the same vocabulary exercises as the condition 1.

As expected, we can see that Condition 3 (writing sentences) was one of the most efficient types of exercises in the immediate meaning test. There was a significant difference between the vocabulary exercises demanding the deepest processing and the shallower processing. However, no other significant differences were found between the Condition 1 requiring the shallowest level of mental processing and Condition 2 requiring deeper level of mental processing than Condition 1.

The least effect of vocabulary exercise type in Condition 1 was expected from the previous findings because this type of exercises requires the students only to match the target words with their definitions after learning them presented in the mini-dictionary. On the other hand, the vocabulary exercises in Condition 2 could give students chances to apply the word in its example. Nitsch (1977) and DiVesta and Peveryly (1984) found that examples studied with definitions produced better retention than definitions alone. Words provided with examples are an effective kind of elaboration on word learning. From this perspective, the reason why no significant effective finding between Condition 1 and 2 may be that the vocabulary exercise requiring students to choose the number indicating an appropriate word to fill in the blank of a sentence did not activate a sufficient amount of semantic processing comparing to the vocabulary exercise requiring students to match the words with their meanings in this study.

Besides, there was no statistical difference between Condition 3 (writing sentences) and Condition 4 (3 matching). That is, three vocabulary exercises requiring the shallowest processing are as effective as one vocabulary exercise requiring the deepest processing on the immediate L2 vocabulary learning.

## 2. The Effect of Vocabulary Exercise on the delayed VKS

Although Condition 1, 2, and 3 showed no significant differences in the delayed posttest, the mean score of the three groups followed the levels of processing theory representing that deeper processing leads to better learning.

In contrast to the results of the immediate posttest, Condition 3 requiring the deepest mental processing do not always lead to better retention of L2 words in the delayed posttest. While it has failed to gain significant difference between Condition 3 (writing) and the Condition 4 (3 matching), students who worked with a word three times recorded better mean scores than students who wrote sentences with the target words on the delayed L2 vocabulary retention. Some studies support the notion that multiple encounters with each word will result in better retention than a single deep processing of a word and the data of the current study support this proposition in the delayed vocabulary test.

## VI. CONCLUSION

Teachers, curriculum planners, textbook writers, and educational software designers are interested in the effective way to design written practice exercises for L2 learners who want to increase their L2 vocabulary knowledge. Nevertheless, so very little research has been done on vocabulary practice exercises which play such an important role in L2 vocabulary acquisition.

It has been believed that exercises which require deeper processing produce better retention (Craik & Lockhart, 1972; Craik & Tulving, 1975). As expected, it was found from this study that the vocabulary exercises requiring deeper level of processing produces greater effect on vocabulary learning. Although no other significant differences were found between Condition 1 and Condition 2 except the one between Condition 3 requiring the deepest level of mental processing and the conditions requiring shallower level of mental processing, each group's mean score indicated that deeper processing leads to better learning.

The superior performance of sentence writing examined in the immediate test was supported by the previous research (Laufer & Shmueli, 1997; Laufer, 1998b) and many educators believe that writing sentences produce more learning because students must come up with their own examples. With this line of thinking, the sentence writing involved in condition 3 results in a statistically significant higher amount than Condition 1 and 2 on the immediate L2 vocabulary learning.

Condition 4 with three practices of matching vocabulary exercise was introduced into the current study. While the time required for each condition was controlled in the present

study, participants can complete the vocabulary exercises requiring shallow mental processing relatively quickly and easily. Thus, this was done to control for time on task more accurately. Furthermore, it is an attempt to solve the question whether several vocabulary exercises with shallow processing is as effective as one vocabulary exercise with deep processing in the same amount of time.

The effect of rehearsal (Baddeley, 1990) and distributed practice (Atkins & Baddeley, 1998) are well-known in the psycholinguistic and educational psychology literature. According to Ellis (1995), a simpler task may lead to more acquired per minute of input. Similarly, the results of this study tell us that Condition 4 having three vocabulary practice conditions is as effective as Condition 3 writing sentences on the vocabulary learning and more effective on the vocabulary retention. Therefore, it would appear that multiple encounters with the words in condition 4 are more facilitative factors in L2 vocabulary retention than the "depth of processing" that writing sentences with new L2 vocabulary may offer. In sum, the sentence writing may be effective immediately after learning new L2 words due to the depth effect but it was expected that multiple encounters with words in Condition 4 result in better retention rates than Condition 1, 2 and 3.

Although many teachers assign their students the task of writing sentences, it is not more effective way of retention of new L2 vocabulary than doing several simpler matching vocabulary exercises within the equivalent time. However, this is not to say that writing sentences or filling in the blank are not effective for overall L2 fluency. The present study only examined the effectiveness of vocabulary exercises in terms of L2 word learning and retention. Thus, the results may be generalized carefully to explain overall effectiveness of writing sentences, multiple-choice cloze or matching vocabulary exercises.

Several limitations of the present study can be submitted for the further studies in this area.

First, it would be worthwhile to use much more assessment to test multiple aspects of vocabulary knowledge in future research. Many vocabulary acquisition studies have measured only one aspect of knowledge, meaning, with only one test. However, Webb's study (2002) indicates that using only one test might provide misleading results because most vocabulary learning tasks probably promote several aspects of knowledge. Thus, measuring multiple aspects of knowledge seems necessary to fully determine their relative efficacy.

Second, there are many different kinds of vocabulary exercises, including true-false, identifying the odd-man out, error identification, short answer, and sequencing. The current study investigated only three of these. Future research should look at different combinations of exercises.

Third, to explore more profound impact that LOP theory has on L2 new word learning, only one immediate posttest could not produce accurate results as seen in the



present study. Therefore, delayed posttests must be included for the long-term effects of the LOP theory. Although the delayed posttest was conducted two weeks later in this study, another delayed posttest a month or so later will produce more meaningful results.

Finally, the participants in the present study were relatively high in the L2 proficiency level and university school students. It is possible that the effect of each condition might be different among learners at different proficiency and age. So, future research can examine other participants involved in the different L2 proficiency levels and age to help the generalizability related to this area.

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## APPEDIX A

### Vocabulary Pretest

학과:                      이름:                      학번:

다음 주어진 단어들의 뜻을 쓰시오.

(확실하지 않더라도 아는 것 같은 단어들의 경우 반드시 뜻을 쓰시오)

bolster:  
bruise:  
burst:  
fib:  
forge:  
fret:  
linger:

caprice:  
lithe:  
pith:  
tatty:  
taut:  
sterile:  
daft:

|           |           |
|-----------|-----------|
| loathe:   | gibe:     |
| plummet:  | bland:    |
| ponder:   | dearth:   |
| squander: | chary:    |
| startle:  | drab:     |
| swipe:    | placid:   |
| toil:     | palmy:    |
| trigger:  | stasis:   |
| curt:     | avid:     |
| mirth:    | lucid:    |
| furtive:  | pliant:   |
| fervid:   | guile:    |
| ribald:   | sedate:   |
| verve:    | bigot:    |
| lush:     | fiasco:   |
| laud:     | rage:     |
| rash:     | vagary:   |
| smug:     | whim:     |
| snub:     | bale:     |
| fuss:     | pundit:   |
| crux:     | rancor:   |
| dour:     | volition: |
| fervor:   | numb:     |
| jovial:   | brat:     |
| maven:    | enmity:   |
| rustic:   | puny:     |
| testy:    | dread:    |

## APPEDIX B

### Mini-dictionary

Mini-dictionary를 참고해서 연습문제를 하시오.

Chary [tʃɛəri] (Adjective) very cautious; slow to give  
매우 주의 깊은, 아까워하는

Enmity [ɛnməti]  
(Noun) hatred; the state or feeling of being an enemy 적의, 증오

Fervor [fɛrvər]  
(Noun) the passion or intensity of feeling or expression 열정, 열의

Fret [fret]  
(Verb) To worry about something 속타게 하다, 걱정하게 하다

Loathe [louð]  
(Verb) To dislike someone or something very much 몹시 싫어하다

Placid [plæsid]  
(Adjective) calm; not easily angered or excited 잔잔한, 조용한

Plummet [plʌmɪt]

- (Verb) To fall straight down; to fall quickly, suddenly, and very hard. 폭락하다, 급락하다  
 Pundit [pʌndɪt]  
 (Noun) A learned person 박식한 사람, 전문가  
 Squander [skwɒndə / skwɒn-]  
 (Verb) To waste; to use something in a bad way 낭비하다  
 Tatty [tæti]  
 (Adjective) worn or shabby 초라한, 낡은

## APPEDIX C

### Vocabulary Exercises

#### Vocabulary Exercise Type 1 (Condition 1)

학과: 학번: 이름:

왼편에 제시된 단어들을 오른편의 적절한 정의와 연결시키시오.

- |              |                     |
|--------------|---------------------|
| 1. Fervor    | 1. 잔잔한, 조용한         |
| 2. Placid    | 2. 몹시 싫어하다          |
| 3. Pundit    | 3. 폭락하다, 급락하다       |
| 4. Tatty     | 4. 낭비하다             |
| 5. Enmity    | 5. 초라한, 낡은          |
| 6. Chary     | 6. 박식한 사람, 전문가      |
| 7. Fret      | 7. 매우 주의 깊은, 아까워하는  |
| 8. Loathe    | 8. 적의, 증오           |
| 9. Plummet   | 9. 열정, 열의           |
| 10. Squander | 10. 속타게 하다, 걱정하게 하다 |

#### Vocabulary Exercise Type 2 (Condition 2)

다음 주어진 문장들의 빈 칸에 해당하는 단어를 박스 안에 있는 단어 중에서 찾아서 그 단어의 번호를 쓰시오. 각각의 단어들은 한 번씩만 사용됩니다.

|            |             |            |           |          |         |           |
|------------|-------------|------------|-----------|----------|---------|-----------|
| 1. Fervor  | 2. Placid   | 3. Tatty   | 4. Enmity | 5. Chary | 6. Fret | 7. Loathe |
| 8. Plummet | 9. Squander | 10. Pundit |           |          |         |           |

- Her \_\_\_\_\_ for India stems from the time she spent there as a child.
- The \_\_\_\_\_ gave lectures on globalization at Universities across the world.
- From 1994 to 1997, I was not serious about my studies. Now I'm really sorry that I \_\_\_\_\_ those three years of my life!
- It is important to keep \_\_\_\_\_ in an emergency.
- John and Bill dislike each other. There is bitter \_\_\_\_\_ between them.
- If you are \_\_\_\_\_ of doing something, you are fairly cautious about doing it.
- I \_\_\_\_\_ the smell of coffee. It makes me sick.
- Suddenly the bird \_\_\_\_\_ to the ground, but I don't know why.
- Why are you always \_\_\_\_\_ing about something? Relax!
- These jeans are so \_\_\_\_\_ they're hardly worth keeping.

**Vocabulary Exercise Type 3 (Condition 3)**

**Write a sentence.**

다음 주어진 단어들을 이용해서 문장을 만드시오.

(Bad example같이 너무 짧고 정의 없이 문장을 만들지 마시오)

|                       |     |  |
|-----------------------|-----|--|
| <b>Good examples:</b> | cat | <b>I like cats, but I don't like dogs.<br/>My first pet was a cat.</b> |
| <b>Bad examples:</b>  | cat | <b>I see a cat.<br/>I like cats.</b>                                   |

- Chary \_\_\_\_\_
- Enmity \_\_\_\_\_
- Fervor \_\_\_\_\_
- Fret \_\_\_\_\_
- Loathe \_\_\_\_\_
- Placid \_\_\_\_\_
- Plummet \_\_\_\_\_
- Squander \_\_\_\_\_
- Tatty \_\_\_\_\_
- Pundit \_\_\_\_\_

**Condition 4 (three practices with vocabulary exercise 1)****Vocabulary Exercise Type1 (the first practice)**

왼편에 제시된 단어들을 오른편의 적절한 정의와 연결시키시오.

- |              |                     |
|--------------|---------------------|
| 1. Fervor    | 1. 잔잔한, 조용한         |
| 2. Placid    | 2. 몹시 싫어하다          |
| 3. Pundit    | 3. 폭락하다, 급락하다       |
| 4. Tatty     | 4. 낭비하다             |
| 5. Enmity    | 5. 초라한, 낡은          |
| 6. Chary     | 6. 박식한 사람, 전문가      |
| 7. Fret      | 7. 매우 주의 깊은, 아까워하는  |
| 8. Loathe    | 8. 적의, 증오           |
| 9. Plummet   | 9. 열정, 열의           |
| 10. Squander | 10. 속타게 하다, 걱정하게 하다 |

**Vocabulary Exercise Type1 (the second practice)**

왼편에 제시된 단어들을 오른편의 적절한 정의와 연결시키시오.

- |             |                     |
|-------------|---------------------|
| 1. Plummet  | 1. 잔잔한, 조용한         |
| 2. Squander | 2. 몹시 싫어하다          |
| 3. Pundit   | 3. 폭락하다, 급락하다       |
| 4. Tatty    | 4. 낭비하다             |
| 5. Loathe   | 5. 초라한, 낡은          |
| 6. Chary    | 6. 박식한 사람, 전문가      |
| 7. Fret     | 7. 매우 주의 깊은, 아까워하는  |
| 8. Fervor   | 8. 적의, 증오           |
| 9. Enmity   | 9. 열정, 열의           |
| 10. Placid  | 10. 속타게 하다, 걱정하게 하다 |



**Vocabulary Exercise Type 1 (the third practice)**

왼편에 제시된 단어들을 오른편의 적절한 정의와 연결시키시오.

- |             |                    |
|-------------|--------------------|
| 1. Plummet  | 1. 초라한, 낮은         |
| 2. Squander | 2. 몹시 싫어하다         |
| 3. Pundit   | 3. 폭락하다, 급락하다      |
| 4. Tatty    | 4. 적의, 증오          |
| 5. Loathe   | 5. 속타게 하다, 걱정하게 하다 |
| 6. Chary    | 6. 낭비하다            |
| 7. Fret     | 7. 매우 주의 깊은, 아까워하는 |
| 8. Fervor   | 8. 잔잔한, 조용한        |
| 9. Enmity   | 9. 열정, 열의          |
| 10. Placid  | 10. 박식한 사람, 전문가    |

**APPEDIX D**

**The Modified Vocabulary Knowledge Scale**

아래 보기와 같이 1 부터 10 까지의 단어를 가지고 각 항목이 요구하는 지시사항대로 답을 적으시오.

보기:

Cat A. I don't know what this word means. \_\_\_\_\_

B. I know this word. It means a small animal  
(provide an English synonym or a translation )

C. I can use this word in a sentence:

I like cats, but I don't like dogs.

(If you do the section B, be sure to do section C.)

- |            |             |
|------------|-------------|
| 1. Plummet | 2. Squander |
| 3. Pundit  | 4. Tatty    |
| 5. Loathe  | 6. Chary    |
| 7. Fret    | 8. Fervor   |
| 9. Enmity  | 10. Placid  |

**Examples in: English**

**Applicable Languages: English**

**Applicable Levels: College or University**

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