

The Effects of Semantic Elaboration on L2 Vocabulary Learning

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The present study investigates the effects of semantic elaboration on L2 vocabulary learning. Sixty-three Japanese university students were divided into two groups and assigned to perform two different output tasks of sentence writing and translation which were assumed to differ in degree of semantic elaboration. The sentence writing group was required to write English sentences with the target words unknown to the participants. The translation group was required to translate Japanese sentences into English equivalents with the same target words as those in the sentence writing task. The sentence writing group outperformed the translation group on the three posttests conducted immediately after, one week after, and three weeks after, the task performance. An analysis of variance showed significant differences in the posttest scores between the two groups. The results of this study present new evidence to indicate that semantic elaboration has positive effects on L2 vocabulary learning and that it can have a long-term effect on retention of L2 vocabulary.

Key words: semantic elaboration, vocabulary learning, retention

1. Background

Craik and Tulving (1975) proposed the concept of elaboration, which rectifies defects in the notion of levels of processing. Elaboration means the addition of information to a stimulus item. According to Craik and Tulving, retention depends on the degree of elaboration of an encoded trace. They added that memory performance cannot be considered simply a function of the number of encoded attributes and that the qualitative nature of these attributes is critically important. Craik and Tulving (1975) also stated that semantic features can be more effective in enhancing memory performance rather than phonological or structural features and that integration of a word-to-be-remembered into a context leads to durable memory.

A considerable amount of research has focused on the effects of semantic elaboration on L2 vocabulary learning, directly or indirectly, and there seems to be a broad consensus among researchers about positive effects of that type of elaboration. The studies concerning the effects, however, have produced mixed results. Some recent studies suggest that semantic elaboration has negative effects. Barcroft (2004) examines

the effects of sentence writing in second language lexical acquisition by comparing it with repetition of word-picture viewing and indicates that sentence writing can have a strong inhibitory effect on word form learning during the initial stages of L2 lexical acquisition. The sentence writing task is considered to lead to a higher degree of semantic elaboration than the repetition of word-picture viewing. He asserts that semantic elaboration can have negative effects on vocabulary learning as well as positive ones. Folse (2006) also investigates the effects of sentence writing by contrasting it with sentence completion and concludes that the multiple sentence-completion task is more effective than sentence writing in retention of vocabulary when time on task is limited. He also claims that a factor more important in the efficacy of an exercise type than depth of processing is multiple retrievals of the target words.

These studies, however, have left some important problems unsolved. One of them is the tasks utilized in these studies. The tasks differ from each other not only in degree of semantic elaboration but also in other aspects such as levels of task (word-level task vs. sentence-level task) and modality of task (receptive task vs. productive task). Therefore, we cannot simply attribute differences in task performance, if any, only to the degree of semantic elaboration. Another problem is that these studies measured different aspects of vocabulary knowledge. It is not clear what aspect of vocabulary knowledge semantic elaboration can facilitate or inhibit in L2 lexical learning. The third problem is that these studies only dealt with short-term effect of tasks. The long-term effect of tasks should be investigated. The purpose of the present study is to examine the short-term and long-term effects of semantic elaboration on L2 vocabulary learning, especially the semantic aspect of L2 vocabulary knowledge with two different sentence-level productive tasks. The research questions which motivated the study are the following:

- (1) Does semantic elaboration promote L2 vocabulary learning?
- (2) Does semantic elaboration have a long-term positive effect on retention of L2 vocabulary?

2. Method

2.1 Participants

The participants in this study were 63 students at a private university in Japan. They were the first-year and second-year students at the proficiency levels ranging from lower intermediate to upper intermediate. They were divided into two groups, both of which were assumed to have equal vocabulary knowledge of the target words because the words were unknown to all of the participants.

2.2 Materials

2.2.1 Target words

A pretest was administered to select the target words for this study. The pretest

included 50 English words chosen from the Academic Word List proposed in Coxhead (2000). The participants were asked to translate the English words into Japanese. Seven nouns and seven verbs whose meanings no student understood were selected as the target words. The nouns were *hypothesis*, *integrity*, *formula*, *revenue*, *reluctance*, *incentive*, and *criteria*, and the verbs were *implement*, *diminish*, *amend*, *comprise*, *convene*, *distort*, and *erode*. A list for learning the target words was prepared (See Appendix A). The list included the target words, the Japanese translation of the words, and example sentences containing the target words with their translation.

2.2.2 Tasks

In order to examine the effects of semantic elaboration on L2 vocabulary learning, two separate tasks of sentence writing and translation were used. In the sentence writing task, students were asked to write their original sentences with the target words (See Appendix B), while in the translation task, the students were asked to translate simple Japanese sentences into English by using the target words (See Appendix C). Both of these tasks have the following features in common.

- Both of them are sentence-level tasks.
- Both of them are productive tasks.
- Both of them require the participants to use the target words.

These tasks, however, differ in degree of semantic elaboration in that sentence writing requires the subjects to think of an appropriate context in which the target word is suitably embedded and create the meaning of an original sentence containing one of the target words. On the other hand, the translation task requires the subjects to put a Japanese sentence given by the author into English with one of the target words mechanically. The Japanese sentence was simplified so that its lexical content would be less than that of the original sentence. Therefore, it is assumed that the former task leads to a higher degree of semantic elaboration than the latter.

2.2.3 Posttests

Three different posttests were prepared to measure the retention of the target words over time, i.e., a posttest immediately after the task performance (Posttest 1), one a week after learning (Posttest 2), and another three weeks after learning (Posttest 3). They included 20 items of the 14 target words and six fillers. In order to avoid the serial position effect and the practice effect, the test items were ordered differently and different fillers were used in each of the tests. None of the tests were announced beforehand to the participants so that this experiment would be incidental learning. Moreover, the participants were asked to report whether or not they had practiced the target words between Posttests 1 and 2 or between Posttests 2 and 3. Two students reported that they had reviewed the words, so their posttest results were excluded from the data.

2.3 Procedure

The target word list was given to the participants and the target words were presented in a deductive way frequently adopted at junior high and senior high schools. Each of the experimental words was pronounced twice and its Japanese translation was presented. Then, example sentences containing the words were read aloud and their meanings were explained to the participants. After all the target words were presented, the participants repeated each of the words twice after the author. Following the rehearsal phase, 33 students in Group 1 were assigned to the sentence writing task, while 28 students in Group 2 were assigned to the translation task. Immediately after performing their task, the participants were given Posttest 1. Posttest 2 was administered one week after the task performance, and Posttest 3 three weeks after the task performance.

3. Results

Table 1 shows the mean scores and standard deviations of the posttests for each condition, and the data of mean scores are also shown in Figure 1.

Table 1. Descriptive Statistics for Each Condition on the Posttests

Task	Posttest	Immediate		One week later		Three weeks later	
		M	SD	M	SD	M	SD
Sentence writing	(n=33)	6.939	3.946	2.212	1.952	2.152	1.958
Translation	(n=28)	4.125	2.820	1.125	1.813	0.964	1.387

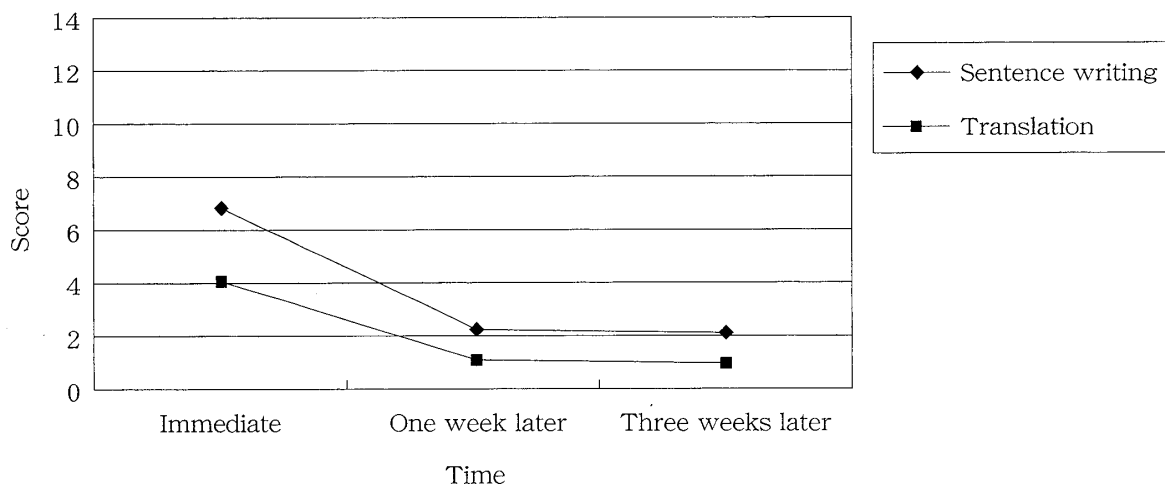


Figure 1. Retention of the Target Words

A 2×3 analysis of variance (ANOVA) was conducted on the scores of the posttests, with task (sentence writing vs. translation) as a between-subjects independent variable and delayed time (immediate vs. one week later vs. three weeks later) as a within-subjects independent variable. This analysis revealed a significant main effect of task [F(1,59)=8.847, P<.005]. It also revealed a significant main effect of delayed time [F(2,118)=161.459, P<.001]. Moreover, there was a significant interaction of task and delayed time [F(2,118)=7.408, P<.001].

A Post hoc Tukey-HSD test was conducted to investigate multiple comparisons between the experimental conditions and it revealed significant differences, as shown in Table 2.

Table 2. Effect of the Tasks on Retention of the Target Words

	SW + P1	SW + P2	SW + P3	T + P1	T + P2	T + P3
	6.939394	2.212121	2.151515	4.125000	1.125000	0.9642857
SW + P1		0.0001***	0.0001***	0.0001***	0.0001***	0.0001***
SW + P2	0.0001***		1.0000	0.0001***	0.0328*	0.0085**
SW + P3	0.0001***	1.0000		0.0001***	0.0522	0.0144*
T + P1	0.0001***	0.0001***	0.0001***		0.0001***	0.0001***
T + P2	0.0001***	0.0328*	0.0522	0.0001***		0.9981
T + P3	0.0001***	0.0085**	0.0144*	0.0001***	0.9981	

SW: Sentence writing task, T: Translation task

P1: Posttest 1(Immediate), P2: Posttest 2(One week later), P3: Posttest 3(Three weeks later)

4. Discussion

Research question 1 asked whether semantic elaboration promoted L2 vocabulary learning. The answer to this question was affirmative. As predicted, the sentence writing group outperformed the translation group on all the posttests. There were significant differences in the posttest scores between the two experimental groups. This study focused on meanings of the target words and definition recall was used to examine the efficacy of tasks in the posttests. On the other hand, Barcroft (2004) focused on the word form. In the posttests the subjects were asked to recall and write one of the target words for each of the pictures they saw. Barcroft (2004) argues that semantic elaboration has a negative effect on learning word forms, even so we cannot deny the importance of semantic elaboration. It is obvious that semantic elaboration does not promote learning of word form but does promote understanding of meaning. The negative effect on word form learning does not diminish the value of sentence writing as a useful way of learning the semantic aspect of vocabulary. Besides improving the understanding of word meaning, sentence writing may enable learners

to use L2 vocabulary properly. The orthographic knowledge of vocabulary does not guarantee the ability to use the word properly. It is fundamentally important to select an appropriate learning method according to the learning goal, though no one would dispute that the semantic aspect of vocabulary knowledge or meaning should be prioritized rather than the orthographic knowledge in L2 lexical learning.

Research question 2 asked whether semantic elaboration had a long-term positive effect on L2 vocabulary retention. As can be seen in Table 2, the answer to the question was affirmative. The posttest scores for sentence writing condition declined over time, but there was a significant difference in retention between the two experimental groups even three weeks after learning. The results of the current study are inconsistent with those of Folse (2006), which used a modified Vocabulary Knowledge Scale as the posttest. Folse reported that multiple sentence-completion exercises produced better vocabulary retention than sentence writing when time on task was controlled. He concluded that a factor more important in the efficacy of an exercise type than depth of processing was multiple retrievals of the target words. The problem with Folse's (2006) study is that it investigated only a short-term effect of exercises, leaving the long-term effect of tasks open to examination in future. Sentence writing might be more effective than sentence-completion exercises in terms of long-term retention. Webb (2005) also measured gains only immediately after learning the target words, though it measured various aspects of vocabulary knowledge. Some other studies such as Brown and Perry, Jr.(1991), Prince (1996), and Barcroft (2004) concerning effects of type of vocabulary learning tasks or semantic elaboration did not investigate their long-term effects on retention of the target words. In contrast, the present study indicated the long-term learning effect of semantic elaboration clearly.

Note that the present study has a few significant characteristics. First, two similar productive sentence-level tasks, sentence writing and translation, which seemed to differ only in degree of semantic elaboration, were employed to eliminate other factors affecting retention of words and isolate the effect of elaboration. Second, the posttests were not announced in advance so that the participants would learn the words-to-be-remembered incidentally, not intentionally, in order to avoid the influence of other vocabulary learning strategies. Moreover, whether the participants had reviewed the target words or not was confirmed after every posttest, and two students who had rehearsed the words were excluded from the data. Third, the present study was designed to reflect authentic teaching situations, so the method of teaching or learning L2 vocabulary which prevails at junior and senior high schools in Japan was purposely employed in the procedure of the study.

5. Conclusion

The present study examined the effects of semantic elaboration on L2 vocabulary

learning by comparing the two different tasks of sentence writing and translation. The results revealed that semantic elaboration could contribute to L2 word learning and that it could have a long-term positive effect on L2 word retention. They also provided explicit evidence to support the usefulness of sentence writing as a way of learning L2 vocabulary.

This study only dealt with the semantic aspect of vocabulary knowledge in the measurement of learning outcome. Future research could measure various other aspects of vocabulary knowledge. Moreover, this study discussed the issue of L2 vocabulary learning mainly from the viewpoint of encoding. Further research should take into account the relationship between encoding and retrieval such as that predicted by the encoding specificity principle.

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Appendixes

Appendix A. Sample of the Target Word List

<p>hypothesis 仮説 Einstein believed that the <u>hypothesis</u> was correct. アインシュタインはその仮説が正しいと信じていた。</p>
<p>implement 実行する Prime Minister Koizumi <u>implemented</u> the idea. 小泉首相はその考えを実行した。</p>
<p>distort ゆがめる The architect <u>distorted</u> the facts. その建築士は事実をゆがめた。</p>

Appendix B. Sample of the Sentence Writing Task

ターゲットワードを使って、英文を作りなさい。

<p>hypothesis 仮説</p>
<p>implement 実行する</p>
<p>distort ゆがめる</p>

Appendix C. Sample of the Translation Task

ターゲットワードを使って英語になおしなさい。

<p>hypothesis 仮説 あなたは彼女の仮説を知っていますか。</p>
<p>implement 実行する 彼はその計画を実行しなかった。</p>
<p>distort ゆがめる あなたは歴史をゆがめてはならない。</p>