Are Two Words Better than One for Intentional Vocabulary Learning?

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Abstract

The purpose of the study is to investigate whether learning a two-word collocation is superior in retention and retrieval of meaning to learning a single word. The focus is on the effect of a two-word collocation consisting of a known word and a new word for learners, such as school janitor. This study employed 39 high school students. They were asked to remember the Japanese meanings of 20 low-frequency English words, half of which were turned into two-word collocations by attaching high-frequency cues. In short, they tried to remember the Japanese equivalents of 10 single words and 10 two-word collocations. Two types of recall test were conducted. Test 1 presented all the items as single words by removing the cues from the two-word collocations (without the cue condition). Test 2 presented all the items as they were on the list (with the cue condition). Both of the tests were given to the same participants just after the learning phase and one week later. The main results were: (a) two-word collocations showed better retention of meaning than single words and, (b) two-word collocations showed better results in the recall tests with cues in the retrieval phase, whereas the opposite results were obtained without cues in the retrieval phase. Some pedagogical implications were drawn from these findings.

1. Introduction

Many language teachers have concluded that new words should be taught in context, not in isolation. This is based on the assumption that learners can understand from context several aspects of lexical knowledge such as syntactic limitation and collocation as well as meaning. However, in terms of mastering form-and-meaning connection only, several studies have concluded that paired-associate learning or learning words in isolation is more effective than learning words in context. Prince (1996) compared L1-L2 paired associate learning with learning an L2 word in one or two sentences. In the latter condition, the participants had to guess the meanings of the target words from context. The recall test conducted one week after the learning phase showed the superiority of paired associate learning. Laufer and Shumueli (1997) compared the following four conditions: (a) learning an L2 word with L1 or L2 glosses, (b) learning an L2
word with L1 or L2 glosses and a sentence embedded with the target word, (c) learning all the
target words in a long text with L1 or L2 glosses in the left-hand margin, and (d) learning all the
target words in an “elaborated” text with the same glosses as in (c). The elaborated text had a
synonym or a brief explanation just after each of the target words. In a delayed recall test,
conditions (a) and (b) showed better results than (c) and (d). Webb (2007) used 20 artificial target
words and compared learning word pairs (target words and L1 glosses) with learning an L2 word
with an L1 gloss and a sentence embedded with the target word. After the learning phase, he
conducted 10 different receptive and productive tests in order to identify the different
understandings of the words the participants received from these two conditions. The results
revealed that there was no significant difference in any of the 10 tests between the two conditions.
Judging from these previous studies, paired-associate learning is more effective than context
learning as far as the form-and-meaning connection is concerned. This is because learners can pay
more attention to the new words themselves. Longer contexts do not facilitate noticing of target
words (False, 2004).

On the other hand, several studies in the psychological field have concluded that learning
target words with cues is effective in aiding retrieval of their meanings. Thomson and Tulving
(1970) showed the superiority of cued recall to non-cued recall. They revealed that the presence
of a cue facilitated recall of a target word if the target was remembered with the cue. This is called
the encoding specificity principle, and it has been confirmed by other studies. (Higham, 2002;
Higham & Tam, 2005). In the field of language learning, Nakagawa (2008) supported the
principle by comparing three types of cues. She had the same result as the above studies, namely
that given cues were the most effective, regardless of association strength between cues and target
words. In the human mental lexicon, words automatically become associated with other related
words in many ways. Therefore, retention and retrieval of a word is naturally associated with
another word. It is no wonder that cues used in the encoding phase facilitate retrieval of target
words.

If a cue in the encoding phase helps learners to retain and retrieve the meaning of a target
word, is it possible that learning a new word in a chunk or a collocation with a familiar word in it
is more effective than learning a new word on its own? This seems to be effective if learners
already have a basic L2 vocabulary and can use those basic words as helping cues. Ishizuka
(2005) compared paired associate learning to chunk learning, employing 52 university students.
In his chunk learning experiment, the participants had to infer the meaning of a target word in a
chunk including a familiar word such as a car freak or water trough. In the immediate recall test,
paired associate learning showed a better result than chunk learning, but in the delayed recall test
seven weeks later, the result was the opposite: chunk learning showed better retention. Laufer and
Girsa (2008) investigated the effects of three task conditions on incidental vocabulary learning,
using 10 single words and 10 collocations (a verb + a noun). Judging from their descriptive
statistics, the 75 participants, who had already learned the target language for six years, got much
higher scores in collocation than in single, both in the immediate and delayed tests. These studies suggest the effectiveness of chunk or collocation learning.

Thus, it is reasonable to suppose that putting a familiar high-frequency word with a new word to be remembered may facilitate retention and retrieval of the meaning of the target word. In other words, remembering a two-word collocation consisting of a known word and a new word can be more effective than remembering a single new word alone, if the target is presented with the known word in the retrieval phase. On the other hand, without the cues in the retrieval phase, paired-associate learning can show a better result in a recall test than collocation learning. Learning collocations will be more effort for learners than learning single words, and what is hard to learn is easy to forget (De Groot & Keijzer, 2000).

The purpose of the study is to examine whether learning a two-word collocation is superior in retention and retrieval to learning a single word in two conditions: recall with cues and recall without cues. The focus is on the effect of a two-word collocation consisting of a known word and a new word for learners, such as a school janitor (a noun + a noun) or a dirty hovel (an adjective + a noun). This is partly because this type of association is one of the strongest and most important links in human word-networks (Aitchison, 2003), and partly because it is easier to find collocations than other links, such as coordination (salt and pepper), superordination (insect and butterfly) and synonymy (starved and hungry) in terms of a known-and-unknown word combination.

2. Method

2.1 Hypotheses

The following hypotheses were set in the present study.

(1) Two-word collocations are superior to single words in aiding retention of meaning.
(2) Without cues in the retrieval phase, single words show better results in a recall test than two-word collocations.
(3) With cues in the retrieval phase, two-word collocations show better results in a recall test than single words.

2.2 Participants

This study employed 39 Japanese students at a private high school who belonged to three different English-related classes. They all had more than five years of experience of learning English. The experiments with each of the classes were conducted in different places on different dates, but used the same procedure.

2.3 Materials

The author made a word list of twenty English words that are so low in frequency that they
are not found in the list of JACET 8000 (JACET, 2003). All of the 20 target words satisfied the following three conditions: (a) each item was a noun but not a loan word; (b) the length of each item was limited within 5-7 letters; (c) each item had no affixes that could help the participants to infer its meaning. Half of them were turned into two-word collocations by attaching high-frequency words, all of which belonged to the 1000 to 3000 word range in JACET 8000 except the word *unlighted*. The author chose frequent two-word collocations by referring to the British National Corpus and some English-Japanese dictionaries for students. Each item had a Japanese translation. A collocation and a single word were shown alternatively on the list. All of the 10 single items and 10 collocations are shown in Table 1.

Then two tests were made to ask the participants to write the Japanese translations of the target words. Test 1 presented all the items as single words by removing the cues from the two-word collocations. Test 2 presented all the items as they were on the list. In terms of the two-word collocations, Test 1 asked for the meanings of the target words only (non-cued recall), whereas Test 2 asked for those of the two-word collocations (cued recall). The 10 single words were shown as they were in both of the tests. The order of the items in each test was randomized in order to avoid the order effect in learning.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The 10 Single Items and 10 Collocations on the List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Item</td>
<td>Translation</td>
</tr>
<tr>
<td>amnesia</td>
<td>kiooku-soushitsu</td>
</tr>
<tr>
<td>myopia</td>
<td>kinshiki</td>
</tr>
<tr>
<td>disdain</td>
<td>keibetsu</td>
</tr>
<tr>
<td>eczema</td>
<td>shisshin</td>
</tr>
<tr>
<td>glutton</td>
<td>ooguino-hito</td>
</tr>
<tr>
<td>knoll</td>
<td>chiisana-oka</td>
</tr>
<tr>
<td>mason</td>
<td>ishiya</td>
</tr>
<tr>
<td>natter</td>
<td>oshaberi</td>
</tr>
<tr>
<td>odium</td>
<td>zouo</td>
</tr>
<tr>
<td>pannier</td>
<td>nimotsu-kago</td>
</tr>
</tbody>
</table>

*Note.* The words in bold letters were the target words shown in Test 1. The words in italics in the two-word collocations were the cues. Both of the cues and the target words in the collocations were shown in Test 2.

2.4 Pilot Study

A pilot study was carried out to predict whether or not the participants would have any knowledge of the target words, and to determine the length of time they would need for the
learning and retrieval phases. There were 10 university juniors in the pilot study. It was found that none of them had any knowledge of the target words. First, they were given the lists of the target items and tried memorizing their meanings. Second they took Tests 1 and 2 consecutively. Watching their performance, the author found five minutes necessary for the learning phase and three minutes for each test.

2.5 Procedure

First, the participants were given the word lists and instructions on how to pronounce each item. Then, they were given five minutes to remember the Japanese meaning of each item. After the learning phase, they took Test 1 and Test 2 in succession. They were asked to write the Japanese equivalents of the 10 single items and the 10 target words in the two-word collocations in Test 1, and then the 10 single items and the 10 two-word collocations in Test 2. They had three minutes for each test. One week later, the same tests were given to the participants without advance notice.

2.6 Scoring

Two points were given for each correct answer, and one for a partially correct answer. For example, in the case of the word “pannier”, the correct answer was “nimotsu-kago”, while “kago” was a partially correct answer. Another example of a partially correct answer was “osoroshii-kyoukenbyou” for the word rabies. In this case, test-takers carelessly wrote the Japanese translation for its two-word collocation, terrible rabies, though the item did not have the cue terrible in Test 1. On the other hand, an answer osorosii for terrible rabies in Test 2 received no points because it was a translation of the cue, not the target word. The top score for each test was 20 points.

2.7 Data Analysis

In order to examine Hypothesis 1, two-way (item type × time) ANOVAs were conducted on the results of each item type (single and collocation) in the Test 1 and Test 2 conditions (immediate and delayed) respectively. The ANOVAs were expected to show a decrease in scores for the single words compared to the two-word collocations. In order to examine Hypothesis 2, paired-sampled t tests were carried out between the scores of the single words and the two-word collocations in the immediate Test 1 and the delayed Test 1 respectively. Finally, in order to examine Hypothesis 3, paired-sampled t tests were carried out between the scores of the single words and the two-word collocations in the immediate Test 2 and the delayed Test 2 respectively.

3. Results

Table 2 shows the means, standard deviations, and minimum and maximum values of the
two item types in the immediate Test 1 and the delayed Test 1. Table 3 shows those in the immediate Test 2 and the delayed Test 2. Figure 1 shows the mean of each test. As you can see, the single words showed higher scores in the Test 1 (without cues) condition, whereas the two-word collocations showed higher scores in the Test 2 (with cues) condition. Figure 1 also revealed that the single words showed a sharper decline between the immediate and delayed tests in both the Test 1 and Test 2 conditions.

The results of the two-way ANOVAs showed that there was a significant interaction between item type and time in the Test 1 condition, $F(1, 38) = 16.12, p < .0001$, and in the Test 2 condition, $F(1, 38) = 9.96, p < .01$, respectively. In the Test 1 condition, the $t$ tests showed that the scores of the single words were significantly higher than those of the target words in the two-word collocations both in the immediate test, $t(38) = 6.39, p < .0001$ and in the delayed test, $t(38) = 2.48, p < .05$. In the Test 2 condition, however, the $t$ tests showed the opposite results: the scores of the two-word collocations were significantly higher than those of the single words, both in the immediate test, $t(38) = -4.02, p < .0001$ and in the delayed test, $t(38) = -8.73, p < .0001$.

Table 2

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Mean</th>
<th>$SD$</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>13.72</td>
<td>5.32</td>
<td>2.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Target in Collocation</td>
<td>8.77</td>
<td>5.00</td>
<td>0.00</td>
<td>19.00</td>
</tr>
<tr>
<td>Delayed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>4.79</td>
<td>3.87</td>
<td>0.00</td>
<td>16.00</td>
</tr>
<tr>
<td>Target in Collocation</td>
<td>3.28</td>
<td>3.06</td>
<td>0.00</td>
<td>12.00</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Mean</th>
<th>$SD$</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>14.46</td>
<td>5.09</td>
<td>2.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Collocation</td>
<td>16.90</td>
<td>4.29</td>
<td>0.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Delayed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>6.05</td>
<td>4.04</td>
<td>0.00</td>
<td>16.00</td>
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<tr>
<td>Collocation</td>
<td>10.74</td>
<td>4.48</td>
<td>0.00</td>
<td>19.00</td>
</tr>
</tbody>
</table>
4. Discussion

Hypothesis 1 posits that two-word collocations are superior in retention of meaning to single words. This was supported because there was a significant interaction in retaining the scores of the recall tests between item types and time in both the Test 1 and Test 2 conditions respectively. The single words showed a significantly sharper decline in score, whereas the drop in the two-word collocations was slighter. A possible reason for this result is that the cues which had already existed in the participants' mental lexicons helped them to fix the target words in their short-term memories. Then the connections between the cues and the target words were formed and these connections facilitated the fixing of the target words into the participants' long-term memories.

Hypothesis 2 predicts the superiority of single words to two-word collocations in recall tests if there are no cues in the recall phase. This was confirmed because the scores of the single words were significantly higher than those of the target words in the two-word collocations, both in the immediate Test 1 and the delayed Test 1 (without cues). Without the help of the cues in the retrieval phase, the meanings of the target words in the two-word collocations were harder for the participants to retrieve than the single words. In Test 1, these 10 items were deprived of the familiar words that had accompanied them in the learning phase. On the other hand, the single words were presented in the tests as they had been in the learning phase. Generally speaking, test-takers get high scores if test items are the same as items they have learned. Incompatibility between learning and testing tasks negatively affects testing task performance (Steinel, Hustjin & Steinel, 2007). In the Test 1 condition, incompatibility of the two-word collocations between the learning and testing phases was probably the main cause of the poor performance of the
participants.

Hypothesis 3 expects the superiority of two-word collocations to single words in recall tests if there are cues in the recall phase. This was also verified because the scores of the two-word collocations were significantly higher than those of the single words, both in the immediate Test 2 and the delayed Test 2 (with cues). In the Test 2 condition, both the single words and the two-word collocations were shown as they had been presented on the list. There was no difference in presentation between the two types. Therefore it could be said that the 10 familiar words attached to the 10 target words facilitated the retention and retrieval of the meanings of the target words.

This mechanism is illustrated in Figure 2. In the encoding phase, first, a learner sees the two-word collocation, “school janitor,” and the cue “school” activates the equivalent in his/her mental lexicon. Second, the learner tries to remember the new word “janitor.” Finally, the connection between “school” and “janitor” is formed in the mental lexicon. In the decoding phase, the learner sees the same two-word collocation. Again, the familiar word “school” activates the “school” in the mental lexicon, and then, the word “school” in the mental lexicon activates the connection to the word “janitor.” In the end, the learner successfully retrieves the meaning of “janitor.” In this way, the connection between a familiar word and a new word is formed, and this connection can strengthen the retention and expedite the retrieval of the target word.

- Encoding phase

- Decoding phase

Cues facilitate retention of target words.

Cues help with retrieval of target words.

*Figure 2.* The mechanism of how cues facilitate retention and retrieval of target words

Finally, the author would like to mention the limitations of this study. First is the small number of participants. In order to consolidate the results of the present study, a larger population
is needed. Second, the difference in quality between the two types of target words might have affected the results. Though the author tried to make the conditions of the target words, such as length and frequency, similar to each other, other aspects of the target words might have influenced the test performance. One of the possibilities is concreteness. It is said that concrete words are easier to learn and less susceptible to being forgotten than abstract words (De Groot & Keijzer, 2000). In this study, concrete words such as damsel or hovel may have been easier for the participants than abstract words such as disdain or odium. In a further study, the target words in two-word collocations should be the same as single words, and one of the two groups with the same English proficiency should be assigned to each of the conditions. Third, another study should be carried out to investigate the relationship between the effectiveness of two-word collocations and vocabulary sizes of learners. By employing high school students who already knew high frequency English words, the present study showed the effectiveness of two-word collocations in retention and cued recall. However, is this also the case with learners with small vocabulary sizes, say, first graders at junior high school? The same experiment should be conducted with novice learners of English who have really small vocabulary sizes. Fourth, other types of two-word combinations, such as a verb with a noun or a verb with an adverb, should be tested in further studies to obtain more support for the effectiveness of two-word collocations.

5. Conclusion

This study revealed the effectiveness of two-word collocations for intentional vocabulary learning. Remembering a two-word collocation that consists of a familiar word and a new word is better for retention of the meaning of the new word than remembering the new word on its own. In addition, the retrieval of the new word can be easier if the new word is shown with the familiar word attached to it in the encoding phase. The familiar word works as a cue in the decoding phase.

Therefore, presenting new words combined with familiar words can be an effective way of vocabulary learning for learners who already know basic high-frequency English words. Another advantage of teaching collocations is that it can show a productive use of vocabulary. It could help learners to develop better communicative skills.

References

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