The Effects of Input Type and Tasks on Vocabulary Learning

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Abstract
This paper will examine if different type of inputs and tasks have different effects on L2 vocabulary learning. Two studies were conducted from 2013 to 2014 with 29 English native speakers who were learning Japanese in university.

In Study 1, the 37 verb list was presented to three groups under three conditions: words in alphabetical order, words with pictures, and words grouped by categories. Learners took a test at five different times. The results showed that accuracy rates went up after intentional vocabulary learning; however words were not retained and scores dropped significantly on the test performed 10 days later. Contrary to our assumptions, the SPSS analysis did not show a correlation between the type of input and test results. One possible explanation for this is that the beginning level learners are linking L1 translations to L2 words, rather than processing pictures or categories.

In Study 2, two groups of learners were assigned two different tasks with 27 verbs. Task 1 required the learner to complete a word by filling in the missing syllable. Task 2 was to read a story containing target verbs and then translate it to their L1. The learners took a vocabulary test and task tests 10 days later. The analysis showed a significant correlation between task type and word retention. The reading & translating task group had a higher score. This result suggests that reading and active linking with the learners' L1 activates a deeper recognition and brings a positive effect on vocabulary learning.

Keywords: vocabulary learning, word retention, task, input, word list

Vocabulary: How much is enough?

Lack of vocabulary impedes smooth performance in communication. Knowing an insufficient number of words causes an obstacle for reading. Lexicon is a key component of language. However, one of the difficulties of learning vocabulary is its size.

The size of recognition vocabulary (or passive vocabulary) of native English speakers is about 20,000 words at the high school graduate level. An educated person has a recognition vocabulary of 50,000 (Nation, 1990; Aichison, 2003). In the case of native Japanese speakers, recognition vocabulary is 20,000 to 40,000 at the middle school level, and 40,000 to 50,000 at the high school level (Hayashi, 1982; Hida & Sato, 2002).

How about second language learners? How much vocabulary do second language learners need to know? As a reference, there is a test called 'Japanese Language Proficiency Test' that has levels ranging from N5 to N1. The criteria for passing the N5 level is knowing 1,000 words, N4 is 2,000, N3 is 4,000, N2 is 6,000, and N1 is 10,000 words. The N1 and N2 levels are for those who are aiming to enter as undergraduates at most universities in Japan. The learners need to know this much vocabulary. However, there are limitations to remembering thousands of words by rote learning. Therefore, the researchers and language teachers have been seeking theories and techniques to promote vocabulary learning.

Previous Research

Several theories have been discussed on vocabulary learning. Examples of such are 'the depth/level of processing theory' advocating the levels-of-processing effect on word memory (Craik & Lockhart, 1972), 'transfer appropriate processing theory' examining the initial encoded information and its retrieve (Morris, et. al., 1977) , 'involvement load hypothesis' positing effect of the amount of involvement in the task onto the retention of word (Laufer & Hulstijin, 2001; Hulstijin & Laufer 2001), 'the dual coding theory' postulating that coding a stimulus from verbal association and visual imagery increases the chance of remembering the item (Paivio & Descroshers, 1980), 'type of processing-resource allocation model' disputing the level of processing and learning of the semantic properties of words (Barcroft, 2004b), and so on.

Various techniques and methodologies to promote vocabulary learning have also been suggested. One discussion among them is concerning reading. As an early research, Nagy, Herman & Anderson (1985) states that a moderate amount of reading will lead to substantial vocabulary gains. Hulstijin, Hollander & Greidanus (1996) remark that the look-up behaviour of learners with marginal glosses or a dictionary will foster incidental vocabulary learning. Another topic is to examine the effects of visual materials and multimedia systems. Plass et. al (1998) reported that students' performance was best when both visual and verbal modes of instruction were selected, moderate when students selected only one mode of instruction, and worst when they selected neither. Chun & Plass (1996) touched on a hypermnesia effect on the text-plus-picture words, which predicts better recall of pictures over time. As for a student's strategies, Read (2000) proposed a keyword technique to remember words.

Those topics drew a great deal of interest from researchers and numerous papers performing verification experiments have been presented.

As we see from the brief summary above, there is a number of research and suggestions on vocabulary learning, however, intriguingly, not much research has been done targeting the beginning level students, especially Japanese language learners. In this paper we will discuss vocabulary learning of the beginning level Japanese language learners.

Research Questions and Assumptions

We will focus on vocabulary learning and classroom instruction. How to present new vocabulary is of fundamental interest to language teachers. The discussion in this paper is to see how vocabulary presented to learners affects the learners' vocabulary learning. To answer this question, we used three types of word lists as an input: words in alphabetical order, words with pictures representing meanings, and words grouped under a title like 'weekend' or 'classroom'.

Most textbooks present new vocabulary in an alphabetic order. The word list in alphabetic order is supposed to give subjects a phonological cue. This is word list Type 1. Word list Type 2 has pictures illustrating the meaning of a verb. Many language teachers use illustrations, images, and pictures to introduce new vocabulary at the beginning level of instruction. Its motivation is that teachers want to avoid interference from learners' L1. Also, the combination of text and image is expected to leave a reinforced trace in the memory more than showing just a text as previous research has suggested (cf. Paivio & Descroshers, ibidem). Word list Type 3 grouped words by categories. Moher et. al (2012) discuss that both adults and toddlers can increase the total amount of stored information by "chunking" object representations in memory. Mochizuki et. al. (2003) state that learning words under the same topic makes it easy to establish a network through the association of words. This list is used expecting the subjects could associate words by categories.

Our assumption is that the words with pictures or words under a category should demonstrate a significant difference in vocabulary learning. That is, we predict that imagery or word grouping will reinforce learners' memory as previous research has suggested.

Study 1

Subjects

The experiments were conducted from 2013 to 2014. There were 13 subjects in 2013, and 16 subjects in 2014, for a total of 29 subjects participating in Study 1. They were all native speakers of English and beginning level Japanese language learners at the University of Guam. The textbooks that they were using were all the same and the speed of teaching and content of materials were all the same. They had taken the Japanese language course before, at least for one semester.

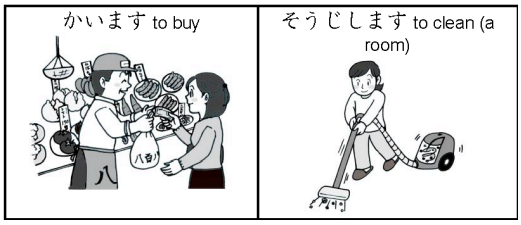
Materials

Subjects were divided into three groups. Three types of word lists (Type 1, Type 2, and Type 3) were assigned as a variable to each group. Each list contained the same 37 verb words. The reason for using verbs was to minimize the difference of word knowledge among subjects and the influence from previous learning. Nouns are said to be easier to acquire than verbs (Rogers, 1969; Davelaar & Besner, 1988; Ellis & Beaton, 1993), because nouns evoke a mental image more easily than verbs. Some of the subjects took Japanese during high school so they started with more noun knowledge. However, since high school education is not intensive and focuses more on the cultural aspects, overall the subjects' vocabulary was limited, and they were still beginning level learners.

Examples of each word list are below. Type 1 word list indicates the verb words in Japanese alphabetical order. Type 2 word list shows the verb words with pictures. The pictures are cited from the website for Japanese language teachers (see appendix). Type 3 word list divides the words into 11 categories under the title of: going to school, bus, door, classroom, study, night relax time, library, friend, TV, weekend, and party.

あ～ [a, i, u, e, o]	
a i ma su あいます	to meet
a k e ma su あけます	to open
a so bi ma su あそびます	to play

Type 1



Type 2

weekend	
せんたくします	to do laundry
そうじします	to clean (a room)
やすみます	to take a rest/ day off

Type 3

Procedure

Five tests were given to three groups.

Test 1: The test was given to the subjects without notice. Its format was a typical vocabulary quiz. Words were arranged in random order. The subjects had to write a Japanese word corresponding to an English translation.

Test 2: Subsequently subjects were provided with word lists. They were instructed to memorize those words in 10 minutes and would take a test with the same format. Each group received a different type of word list. While subjects were memorizing words, some were writing words in their notebooks, and some others were mumbling

the words. After 10 minutes of intentional vocabulary learning (IVL), they took a test. The test format was the same as the word list, but it contained only the English part and subjects had to fill in the corresponding Japanese words.

Test 3: The next day, the vocabulary test was given without notice to see subjects' word retention. The format of the test was the same as the one used in Test 2.

Test 4: After Test 3, subjects were told to memorize the words over the four day weekend, and that they would be tested in the same format. This was Test 4.

Test 5: Ten days after Test 4, subjects were given a test in the same format without notice to measure their word retention.

Results

The table below shows the increase rate of the results between subsequent tests. The words were new to the most subjects and they could not answer many in Test 1. The average correct answers were 8 out of 37. After 10 minutes of IVL, the score of Test 2 increased; however, the words in their memory were not retained for 24 hours (Test 3). The average increase rate was -5.1%. After four days of IVL, most subjects' test score increased as we would expect (Test 4). The average increase rate went up to 33.1% compared to the result of 10 minutes of IVL (Test 2). At this point, teachers would be satisfied and believe that the learners remembered new vocabulary. However, the score dropped after 10 days (Test 5). It was at most a 70.3% decrease, and the average was a 28.3% decrease compared to Test 4.

	T1 vs. T2	T2 vs. T3	T2 vs. T4	T4 vs. T5
The lowest increase rate	-2.7%	-27.0%	-2.7%	-70.3%
The highest increase rate	56.8%	10.8%	67.6%	0%
The average increase rate	27.7%	-5.1%	33.1%	-28.3%

Table: Increase rates between two test results

Those who started from a low score were especially prone to forgetting. This result is not surprising. The main inquiry of this paper is if there is a correlation between the type of input and vocabulary learning. We used the chi-square test to examine the correlation between the type of word list and each test result from Test 2 to Test 5. We predicted word list Type 2 and Type 3 should have a positive effect in vocabulary learning. The result, unexpectedly, did not show any significant differences. That is, the advantages of using pictures or grouping were not seen as suggested by previous research. This suggests that there is no difference in vocabulary learning by input for the beginning level of learners. One possible explanation for this could be that the learners are matching L2 words with their L1 word in their mind even if they are looking at the pictures or drawings as Matumi (2002) pointed out. Therefore, whether there is a picture with a word, or whether words are grouped by a topic does not bring a significant effect.

Study 2

Research Questions and Assumptions

Since Study 1 results show that the different inputs do not have a strong effect on vocabulary learning for the beginning level learners, we conducted Study 2. Study 2 was designed to see if the different types of tasks effect word retention.

Among the various theories on vocabulary learning, let's observe 'the depth/level of processing theory' and 'involvement load hypothesis'. These notions were developed from the depth of processing model, which was first proposed by Craik & Lockhart (1972). They suggested that retention in long term memory depends on how deep information is processed during learning. Furthermore, Laufer and Hulstijn (2001) advanced the theory and proposed 'involvement load hypothesis', which postulates that the amount of learners' involvement in the task affects the retention of words. Hulstijin (2001) also states that the nature of information processing primarily determines retention. Based on these theories, there is growing interest in using a task in language teaching. There are numerous studies discussing the effect of tasks, too. However, the majority of the previous studies discussed its effects on the oral performance of the learners. There is not much focus on the vocabulary learning for the beginning level learners. If the hypotheses above are pertinent for the beginning level learners too, the different tasks should pose different results in word retention. In order to examine it, we used two types of tasks to examine the correlation between type of task and word retention.

Task 1 is a fill-in-the-letter task. It pushes the learners' attention toward the linguistic aspect of the word. Task 2 is a reading & translation task. It makes the learners' utilize their L1 knowledge. We assume that Task 1 should be more effective for learners' word retention than Task 2; because we expect that the fill-in-the-letter task pushes subjects to more careful attention to each word and each syllable more than reading a long story.

Subject

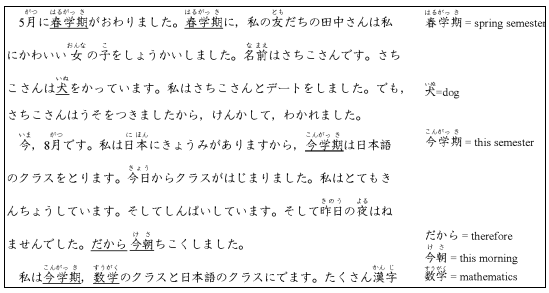
The test was conducted in 2014. The number of subjects was 16. The 16 subjects were divided into two groups (7 subjects and 9 subjects). All of them were in the Study 1 experiment.

Materials

Study 2 used 27 verb words. Each group was assigned a different task. Task 1 is the fill-in-the letter task. It has words which are missing one or two syllables. This task aims to make the subjects focus on the form and meaning of a word. Task 2 is the reading & translation task. It has a story containing the target 27 verb words. The subjects needed to read the story and translate it into their L1. In this case English. Below is an example of the tasks. Non-target words were indicated in the right column with English translations to avoid interference in Task 2.

to cut	き（　）ます
to quit	（　）めます
to worry	し（　）ぱ（　）します
to walk	（　）る（　）ます
to loose	（　）く（　）ます
to begin (something)	はじ（　）ます
to need	い（　）ます
to receive	も（　）います
to cough	せ（　）をします

Task 1



Task 2

Procedure

Preparation: Two group members were given different verb lists. Group A subjects received a verb list with Roma-ji on top, and Group B subjects received a verb list without Roma-ji. The list with Roma-ji was presented to Group A in order to draw the subjects' attention on the phonological cues from the beginning. The order of the verbs is the same. The left column has English translations and the right column has corresponding Japanese words. Each group was instructed to memorize words on the list for 10 minutes and told they would be performing a task. .

Task Activity: After 10 minutes, Group A and Group B were given a different task. The fill-in-the-letter task is for Group A, and the reading & translation task is for Group B. They were allowed to look at the word list in case they had could not recall the words.

Test 1: 10 days later, the subjects were given a vocabulary test without notice. This was a typical vocabulary test looking at English and writing a Japanese word.

Test 2: Subsequently, after the vocabulary test, the subjects were given two task tests. The first one had the same format as the one they did as a task activity 10 days before. This time it was a test and they had to answer without looking at anything.

Test 3: Following Test 2, they were given another task that they did not do 10 days ago as a test.

Result

The correlation between types of tasks and the results of the three tests was examined using Fisher's exact test. The result showed a significant difference on two items below.

	value	df	Fisher' exact test
Task type × 10 days after vocabulary test result	$\chi^2 = 5.333$	1	.038*
Task type × 10 days after reading & translation test result	$\chi^2 = 9.000$	1	.005**

Table 1: Correlation between the task type and test results

First, observe the results between task type and the 10 days after vocabulary test result.

None of the subjects who did the fill-in-the letter task activity could score more than 30% on the vocabulary test. In contrast, half of the subjects who did the reading & translation task activity could answer the vocabulary test with a score of more than 30%.

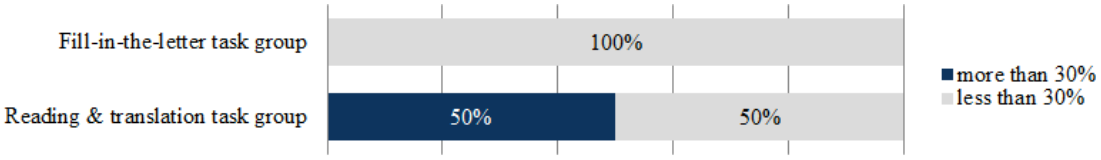


Figure 1: Vocabulary Test Result

There was also a significant difference between the type of task activity and the result of the reading & translation task test after 10 days.

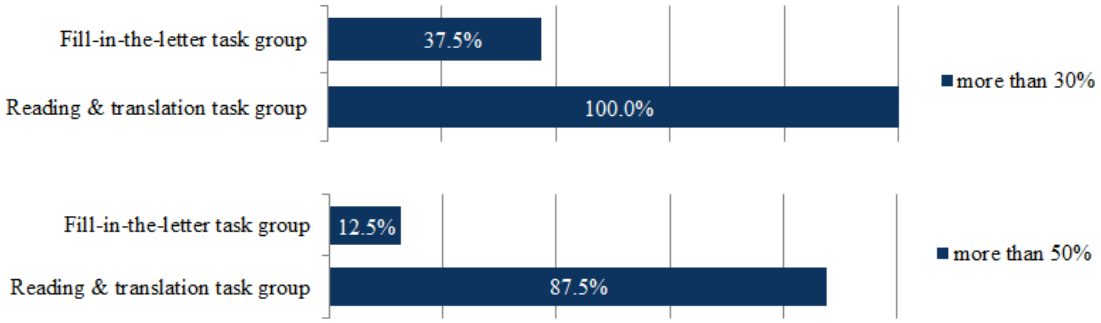


Figure 2: Reading & Translation Task Test Results

Only 37.5% of the subjects, namely about 1/3 of the subjects, who did the fill-in-the-letter task activity could score more than 30% on the reading & translation task test, whereas all the subjects who did the reading & translation task activity scored more than 30%. Coming to the 50% criteria, only 12.5% of the subjects among the fill-in-the-letter task group could score more than 50%. Meanwhile 87.5% of the subjects among the reading & translation task group scored more than 50%. This result indicates the different effects by task type. It suggests that the reading & translation task could promote vocabulary learning more effectively.

The chi-square test did not show a significant difference on the subjects' previous learning history and test results. This means that the test result was not correlated with their past learning period. It suggests that the positive effect was from the reading and comprehending task.

Conclusion

In this paper, we discussed if there is a variable that affects vocabulary learning for the beginning level Japanese language learners. Study 1 did not show any significant difference between the type of input (the word lists) and vocabulary learning. The

test results also show that learners forget a significant amount of what they memorized after a period of time has elapsed. As previous research has suggested (cf. Nakamura, 2011), the result in our study amplified that learners need a process of 'recognition → retention → search & production' repeatedly in vocabulary learning. We do not know how to retain memory yet. However, from our study, we can suggest that the learners should have contact with words again before 10 days has passed.

Study 2 results show the effect of the reading comprehension task. It indicates that the task utilizing the learners' L1 and focusing on reading comprehension has more positive effect on word retention than the task focusing on the word's form and meaning. From the results we can suggest that learners' L1 should not be considered the enemy of vocabulary learning. The language teachers should consider a way to utilize it.

Appendixes
website containing pictures (Minna no Kyozai)
http://minnanokyozai.jp/kyozai/home/ja/render.do

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