

The Relationship Between the Size of Written and Spoken Vocabularies and the Use of EFL Vocabulary Learning Strategies

メタデータ	言語: eng 出版者: 公開日: 2015-06-29 キーワード (Ja): キーワード (En): 作成者: Amano, Shuichi メールアドレス: 所属:
URL	https://doi.org/10.14945/00008805

The Relationship Between the Size of Written and Spoken vocabularies and the Use of EFL Vocabulary Learning Strategies¹

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Introduction

Previous studies on the relationship between the use of vocabulary learning strategies (VLSs) and second language (L2) receptive vocabulary sizes have provided useful information for the introduction of VLS instructions into classrooms (cf., Ansarin, Zohrabi, & Zeynali, 2012; Hamzah, Kafipour, & Abdullah, 2009; Saida, 2006; Tanyer & Ozturk, 2014; Waldvogel, 2013). Saida (2006) examined student vocabulary size and its relationship to the use of VLSs among first-year students at a Japanese public high school with a high percentage of students pursuing a college or university degree. The estimated vocabulary size among the students was approximately 1700 words, and those with relatively larger vocabularies tended to use a wider variety of strategies. The use of organization strategies, which are methods to assist in learning unfamiliar words in relation to known words, differed significantly in frequency depending on each participant's vocabulary size. In a recent survey of adult Spanish learners, Waldvogel (2013) found a meaningful relationship between the size of receptive vocabularies and the VLSs of advanced learners, although this relationship was not present among beginner and intermediate learners.

Studies such as those mentioned above have generally employed vocabulary size tests that involve written test items. However, spoken vocabulary size should also be considered since the visual and auditory vocabularies of English learners whose first language (L1) is Japanese tend to differ in size (Mizumoto & Shimamoto, 2008).² The dissimilarity in vocabulary size between the two modalities may cause a different relationship with VLSs, wherein learners whose visual and auditory vocabulary sizes vary may use distinct types of VLSs. Mine et al. (2006), who examined whether effective VLSs differed according to listening proficiency or visual vocabulary size, suggested employing a spoken vocabulary size test as an outlook for future research, since they adopted only a written test.

Japanese learners of English as a foreign language (EFL) seem to have larger visual vocabularies. Mizumoto and Shimamoto (2008) compared the visual and auditory vocabulary sizes of Japanese learners using both written and spoken tests. Regardless of learner proficiency, the tests revealed a considerable difference between the participants' visual and auditory vocabulary sizes, wherein the former was consistently larger. This indicates that the acquisition of morphological forms does not always ensure the acquisition of phonological forms, and that written tests are clearly different

from spoken tests. Similarly, Amano (2014) compared the scores of Japanese EFL undergraduates who completed a word translation task composed of both written and spoken stimuli. The overall mean scores were significantly higher for written stimuli, a result that was consistent for 28 of the 30 words.

This study provides further insights into the relationship between VLS use and visual and auditory vocabulary sizes among EFL university students with Japanese language backgrounds. Since vocabulary size generally affects the use of VLSs (Saida, 2006; Waldvogel, 2013), there may be a disparity in their use between learners whose visual/auditory vocabulary sizes considerably differ and those whose sizes are similar for both types. If so, VLS instructions should vary depending on the degree of similarity in vocabulary sizes between both modalities.

Survey

Participants

The participants included 151 first-year students from four universities and colleges in Aichi, Japan, who received six years of formal EFL instruction at Japanese junior and senior high schools. None of the students resided in English-speaking countries for a period exceeding a month. Only students who participated in each of the three survey sessions, which involved visual/auditory vocabulary size tests and a questionnaire concerning VLSs, were included in the analysis. Therefore, the analysis included data from the remaining 142 participants, which consisted of 58 and 84 males and females respectively.

VLS Questionnaire

Given that this study attempts to include auditory vocabulary size in its analysis, a variable that has been ignored in prior VLS studies, the questionnaire used in the VLS survey needed to be capable of documenting a wide range of strategies, since those that have traditionally received limited attention could actually play major roles. Therefore, Tanaka's (2012) questionnaire for vocabulary consolidation was adopted for this study, since it contains up to 26 items including oral and written rehearsals as subscales. The surveys were conducted during the first sessions of each EFL course that the participants were enrolled in. Responses were analyzed on a 5-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree."

Vocabulary Size Test

Mizumoto and Shimamoto's (2008) written and spoken vocabulary size tests, which comprise eight stages (from the 1000 to 8000 word level) consisting of 20 questions each, were adapted for use in this study. Considering the participants' proficiencies, the time required to complete both tests, and

the test results reported in Mizumoto and Shimamoto (2008), only the first four stages (from the 1000 to 4000 word level) were used. The formula used to estimate vocabulary size was identical to Nation's (1990, p. 76), which is:

$$\text{Number of correct answers} \times \text{Total number in word list} / \text{Number of test items}$$

The test was composed of multiple-choice L1-L2 translation, as in the example from the written version provided below (Mizumoto & Shimamoto, 2008, p. 39):

1. 静かな、穏やかな

(A) successful (B) quiet (C) strange (D) true

For the visual version, questions and choices were written on a test sheet in Japanese and English respectively, and participants were instructed to choose the correct answer for each question. For the auditory version, only Japanese questions were printed on the test sheet; choices were read aloud by a female, native speaker of American English, whose voice had been recorded onto a compact disc earlier. The auditory and visual vocabulary size tests were conducted during the second and eighth sessions respectively of each EFL course that the participants were enrolled in. Following the auditory test, participants' test sheets were collected to ensure that they could not review them prior to the visual test.

Results

Vocabulary Size Test

Table 1 summarizes the answer data from 142 participants for both vocabulary size tests. Participants were allotted one point per correct response, with the perfect score for each word level being 20. The table contains the means, standard deviations (SDs), minimums, and maximums for each of the four word levels, in addition to totals. The Cronbach's coefficient alpha was also calculated to assess the internal consistency of each vocabulary size test, and the same results were found for both visual and auditory tests (.91). The total mean score was highest (58.88) and lowest (50.42) for the visual and auditory tests respectively, a result that was consistent across all levels. A paired t-test showed that the difference was significant ($t(141) = 14.37, p < .001, d = 0.73$).

Table 1
Descriptive Statistic for Vocabulary Size Tests

Level	1000		2000		3000		4000		Total	
	Visual	Auditory								
Mean	18.26	16.69	15.06	13.77	14.39	11.16	11.17	8.80	58.88	50.42
SD	2.36	2.97	4.13	3.34	3.32	3.74	3.24	3.75	11.10	11.81
Minimum	8	3	2	4	4	0	2	0	20	11
Maximum	20	20	20	20	20	18	17	17	76	71

Regarding estimated receptive vocabulary sizes (see Table 2), the mean was significantly higher for the visual test (2944 words) when compared to the auditory test (2521 words) (paired t-test, $t(141) = 14.36, p < .001, d = 0.73$). Furthermore, Figure 1 shows that the vast majority of participants possessed larger visual vocabularies, although there were eleven exceptions (7.75 percent), which are represented by dots placed below the diagonal line. The correlation between written and spoken vocabulary sizes was rather strong ($r = .81$). Histograms for the number of participants in each 500 word-range are provided in Figures 2 and 3. The visual and auditory vocabularies of 82.39 and 81.69 percent of the participants respectively were between 2001 to 3500 words.

Table 2
Estimated Visual and Auditory Vocabulary Sizes

Level	1000		2000		3000		4000		Total	
	Visual	Auditory								
Mean	913	835	753	689	719	558	558	440	2944	2521
SD	118	149	207	167	166	187	162	187	555	591
Minimum	400	150	100	200	200	0	100	0	1000	550
Maximum	1000	1000	1000	1000	1000	900	850	850	3800	3550

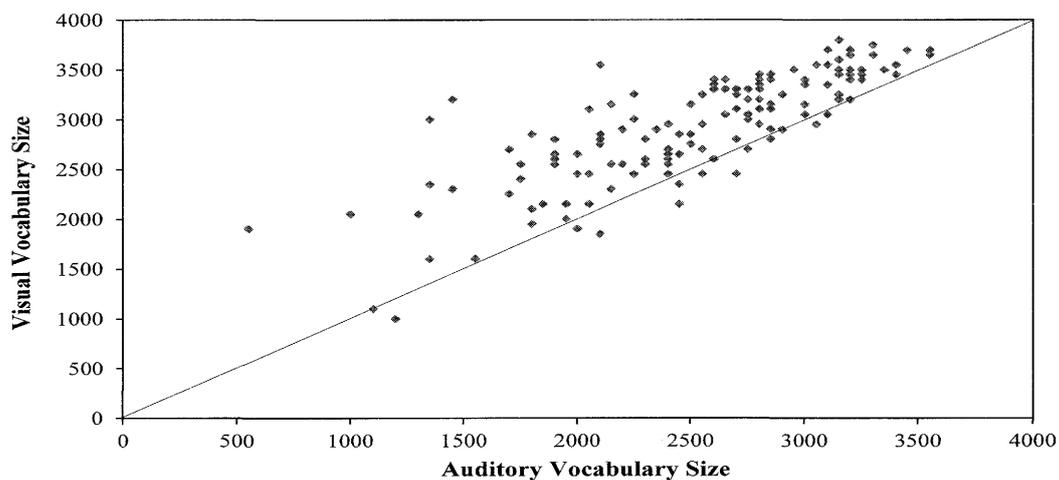


Figure 1. Scatter plot of participants' estimated vocabulary sizes.

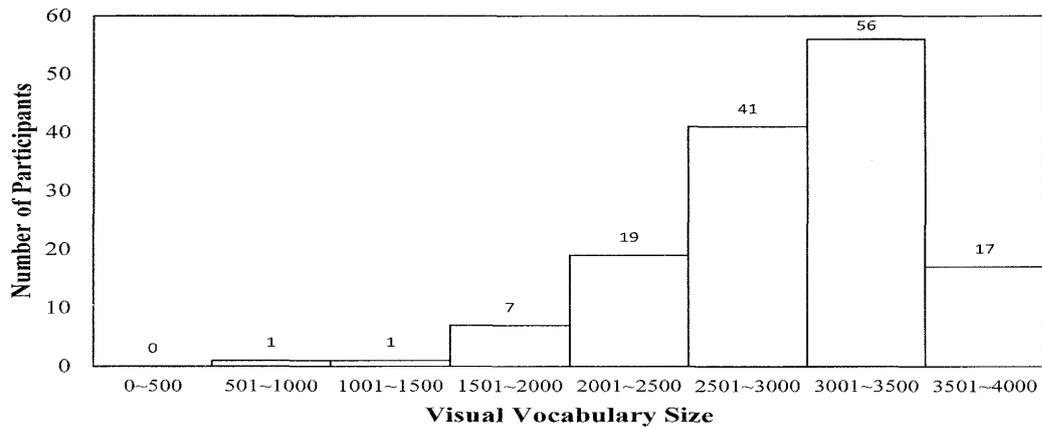


Figure 2. Number of participants in each 500 word-range for the visual test.

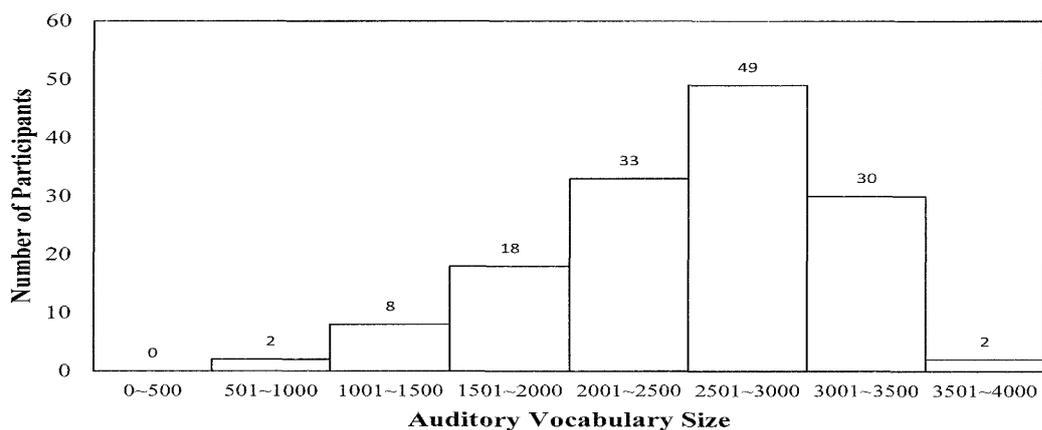


Figure 3. Number of participants in each 500 word-range for the auditory test.

VLS Questionnaire

The means and SDs for each questionnaire item are provided in Appendix. The Cronbach's coefficient alpha was calculated to determine the internal consistency reliability of each subscale, as shown in Table 3. Since the values were consistently high, the means for each subscale were computed and analyzed as scale scores (see Table 4). Both rehearsal types were frequently used, although "written rehearsal" was the most popular; "reference" was also a common strategy among participants. In contrast, "language exposure" was the least frequently employed strategy, which involves an autonomous effort to expose oneself to English outside of the classroom.

Table 3
Internal Consistency Reliability for Each Subscale

Subscale	Oral rehearsal	Written rehearsal	Note-taking	Organization	Reference	Language exposure	Metacognitive
	.76	.84	.76	.80	.87	.83	.87

Table 4
Means and Standard Deviations for Each Subscale

Subscale	Oral rehearsal	Written rehearsal	Note-taking	Organization	Reference	Language exposure	Metacognitive
Mean	3.18	3.62	2.26	2.67	3.17	1.96	2.90
SD	0.91	0.97	0.82	0.85	1.02	0.80	0.90

Comparison of VLSs

After considering several analysis methods, it seemed most appropriate given the data size to divide participants into two groups, with reference to Kelly (1939) and Ohtomo (1996), to compare the VLSs used by both. Participants who exhibited a relatively minor difference in vocabulary size between modalities were included in Group 1, which comprised learners from the top twenty-seventh percentile. In contrast, Group 2 included participants from the bottom twenty-seventh percentile, whose vocabulary sizes differed significantly between modalities. As shown in Table 5, there was roughly an 800-word difference in the vocabulary size between modalities for Group 2. A Mann-Whitney U-test revealed a substantial difference in the visual minus auditory vocabulary size between the two groups ($z = 7.52, p < .001, r = .86$), although a significant difference in the frequency of VLS use did not exist between them (see Table 6 and Figure 4).

Table 5
Learners Grouped According to Difference in Vocabulary Size Between Both Modalities

Group	N	Visual vocabulary size		Auditory vocabulary size		Visual – auditory	
		Mean	SD	Mean	SD	Mean	SD
1	38	2678	658	2649	607	29	129
2	38	2946	456	2096	567	850	282

Table 6
Difference in VLS Use Between Groups

Subscale	Group 1		Group 2		z	p	r
	Mean	SD	Mean	SD			
Oral rehearsal	3.17	0.83	3.16	0.95	0.18	.86	.02
Written rehearsal	3.62	0.91	3.77	0.93	0.68	.50	.08
Note-taking	2.33	0.89	2.14	0.68	1.00	.32	.12
Organization	2.69	0.69	2.45	0.78	1.37	.17	.16
Reference	3.22	1.03	3.09	0.97	0.53	.59	.06
Language exposure	2.00	0.80	1.91	0.75	0.35	.73	.04
Metacognitive	2.89	0.94	2.83	0.90	0.37	.71	.04

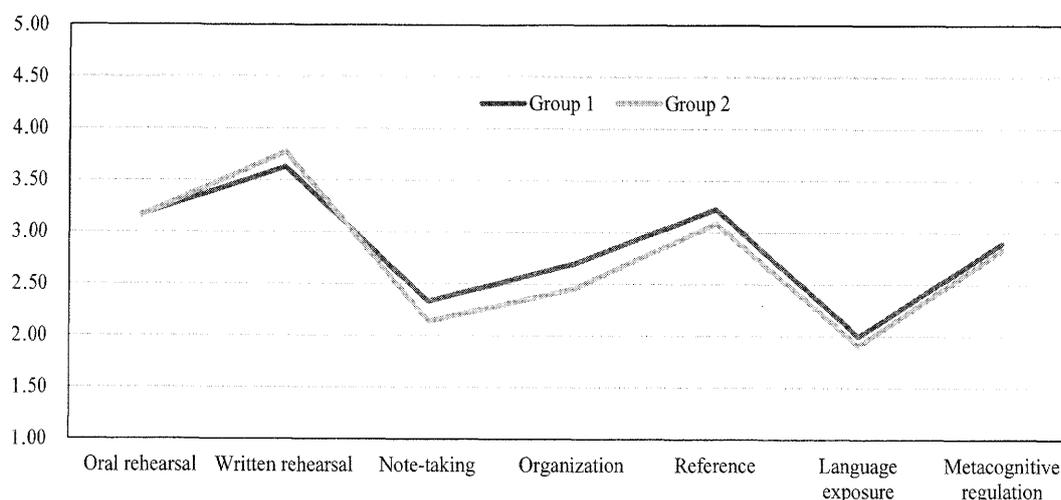


Figure 4. A line graph showing the difference in VLS use between groups

Discussion and Conclusion

A comparison of written and spoken vocabulary sizes revealed a clear difference between the two modalities, a finding consistent with Mizumoto and Shimamoto (2008). Most (92.25 percent) of the participants possessed a larger visual rather than auditory vocabulary. Nevertheless, since the correlation between written and spoken vocabulary sizes was fairly strong ($r = .81$), both types of vocabulary knowledge were closely linked in the mental lexicon. Furthermore, as Table 6 shows, there were generally no distinctive trends in VLS use among participants regardless of their written or spoken vocabulary sizes; as such, VLS use alone cannot explain differences in spoken and written vocabulary sizes.

These results suggest that language teachers should not require students at this level to take both written and spoken vocabulary size tests, as such tests aiming to gauge student vocabulary size for both modalities may not prove beneficial in designing learner-appropriate VLS instructions. This assertion is based on four observations: 1) no relationship was found between the use of VLSs and differences in visual and auditory vocabulary sizes, 2) a strong correlation was found between visual and auditory vocabulary sizes, 3) students may feel overburdened if required to complete both types of vocabulary size tests, and 4) time constraints may prohibit instructors from administering both test types.

Three limitations of this study must be mentioned. First, considering the participants' L2 proficiency and time constraints, only the first four stages of Mizumoto and Shimamoto's (2008) tests were used. However, the fifth stage should have been included as well since 17 participants' visual vocabularies ranged between 3501 to 4000 words (see Figure 2). In some cases, this may have resulted

in the underestimation of participants' visual vocabularies. Second, there was limited variation in proficiency among participants. As Waldvogel (2013) indicated, overall proficiency can be a factor that affects the relationship between receptive vocabulary size and VLS use. Since participants in this study were fairly homogeneous in terms of their lack of experience abroad in English-speaking countries and their length of formal EFL education, it is highly possible that a wider range of proficiencies could reveal additional findings. In that respect, the study's third limitation involves the limited range of its participants' vocabularies: over 80 percent of the learners surveyed possessed vocabularies ranging between 2001 to 3500 words. Therefore, if similar studies are to be undertaken in the future, they should include learners of varying proficiencies and vocabulary sizes.

Notes

1. An earlier version of this paper was presented at the 83rd conference of the Japan Association for Language Education and Technology, Chubu Chapter, at Aichi University of Education on May 24, 2014.
2. While this is true among learners of English whose L1 is Japanese, Milton and Hoplins (2006) found that English learners whose L1 is Arabic did not show much difference in size compared to those whose L1 is Greek.

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Appendix

Means and standard deviations for each questionnaire item (Tanaka, 2012)

SN	Subscales	Questionnaire items	Frequency of use	
			Mean	SD
1	Oral rehearsal	When I try to remember a word, I read it aloud.	3.14	1.10
2	Oral rehearsal	When I try to remember a word, I repeatedly imagine its sound in my mind.	3.27	1.11
3	Oral rehearsal	When I try to remember a word, I read it aloud repeatedly.	3.13	1.12
4	Written rehearsal	I try to remember a word by writing it.	3.74	1.15
5	Written rehearsal	I try to remember a word by writing it while being conscious of its spelling.	3.49	1.20
6	Written rehearsal	When I try to remember a word, I write it repeatedly.	3.68	1.25
7	Written rehearsal	I try to remember a word by writing it while being conscious of its meaning.	3.56	1.11
8	Note-taking	I take notes not only about the meanings of a word, but also other information, such as its antonyms, synonyms, and usage.	2.34	0.99
9	Note-taking	I take notes not only about the meanings of a word, but also its collocational information.	2.37	0.96
10	Note-taking	I take notes not only about the meanings of a word, but also example sentences.	2.06	1.02
11	Organization	I make comparisons between words with similar meanings (e.g., claim and demand).	2.36	1.06
12	Organization	I make comparisons or create relationships between known and unknown words in order to remember them.	2.78	1.09
13	Organization	I make comparisons and create relationships between a word's derivatives, including nouns, verbs, and adjectives to remember it (e.g., agreement, agree and agreeable).	2.63	1.06
14	Organization	I attempt to remember a word alongside its antonym (e.g., increase and decrease).	2.90	1.12
15	Reference	I use a dictionary to deepen my knowledge and understanding of known words.	2.95	1.21
16	Reference	I refer to a dictionary to check the usage of words and phrases.	3.45	1.20
17	Reference	I refer to a dictionary to check the meanings of known words and phrases.	3.27	1.19
18	Reference	I use a dictionary to locate example sentences for known words and phrases.	2.99	1.24
19	Language exposure	I seek opportunities to be exposed to English words and phrases by communicating with people via chat or email.	1.77	0.84
20	Language exposure	I seek opportunities to be exposed to English words and phrases by reading books, magazines, and learning materials.	1.92	0.94
21	Language exposure	I seek opportunities to be exposed to English beyond class assignments and school-provided learning materials.	2.01	1.05
22	Language exposure	I seek opportunities to be exposed to English words and phrases by listening to the radio or educational materials and by watching television programs and films.	2.15	1.12
23	Metacognitive regulation	I try to relearn words or phrases that I cannot remember well or forget.	3.02	1.10
24	Metacognitive regulation	I attempt to learn words and phrase by setting a goal by myself.	2.87	1.05
25	Metacognitive regulation	I attempt to learn words and phrase using a self-directed plan.	2.70	1.07
26	Metacognitive regulation	I learn words and phrases autonomously.	3.02	1.03

Note. The original Japanese version of this questionnaire was used in the survey. The above items were translated by referring to another questionnaire developed by Tanaka (2009).