

# KANSAI GAIDAI UNIVERSITY

## The Relationship between Vocabulary Size and Reading Comprehension among Japanese EFL Learners

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# The Relationship between Vocabulary Size and Reading Comprehension among Japanese EFL Learners

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## Abstract

This paper explores the correlation between reader performance on a standardized reading exam, which was gauged using scores from the reading section of the TOEFL ITP and the GTEC, and vocabulary size, which was measured by administering the bilingual Japanese version of the Vocabulary Size Test (BJVST). A few factors influence reading comprehension, vocabulary size being the primary consideration. To determine the degree to which vocabulary size measured by the Japanese bilingual version of the VST could be used to predict academic reading proficiency measured by the TOEFL ITP reading section, 100 Japanese first-year university students were given the Vocabulary Size Test (Nation & Beglar, 2007) and two reading comprehension tests. The results showed a weak correlation between vocabulary size as determined by the Japanese bilingual version of the VST and performance on the TOEFL ITP and the GTEC. Since other research has established strong links between reading proficiency and vocabulary size, the findings suggest that the VST, especially this bilingual version, alone may be unreliable predictors of reading comprehension levels. In the conclusion, we will suggest possible remedies for the continued use of the VST and paths of future study.

**Keywords:** Vocabulary size, Reading comprehension, Japanese EFL Learners

## 1. Introduction

Ample evidence exists to suggest vocabulary size has a significant correlation with successful reading comprehension (Qian, 2002; Baleghizadeh & Golbin, 2010). Vocabulary size in this case refers to the number of words that a language user can successfully call upon to make a connection between form and meaning while reading a text. While vocabulary knowledge is not the only factor influencing comprehension, it is one of the most important influences. This understanding of the connection between vocabulary size and reading has resulted in

a desire to accurately understand the number of words that a language user comprehends - and to determine how to use that information to set goals for reading proficiency gains.

Various studies have established that readers must understand 95-98% of the words in a text to comprehend it (Laufer, 1989). According to Nation (2006), the chart below illustrates the number of word families needed to gain 98% coverage of various types of text.

**Table 1.**

Texts	98% Coverage	Proper nouns
Novels	9,000 word families	1-2%
Newspapers	8,000 word families	5-6%
Children's movies	6,000 word families	1.5%
Spoken English	7,000 word families	1.3%

Without this level of text coverage, other skills involved in reading, such as guessing from context, inferring, or scanning are unlikely to assist in comprehension of the passage. Non-native language users in university courses using their L2 must learn to deal with a variety of vocabulary and phrases in textbooks, lectures, and articles, so having sufficient vocabulary resources from which to draw is important. Thus, measuring vocabulary size is a useful endeavor in the understanding of one of the main factors in the development of reading proficiency.

## 2. Vocabulary Size Assessments

The study of vocabulary size has become a key aspect of understanding proficiency in several different areas. Reliability, validity, time, practicality, and ease of use are all factors determining which test might be used by language teachers, program administrators, and language learners. Over the last few years, various measures of vocabulary size have become more popular as learners and teachers search for accurate and reliable ways to assess current knowledge. With growth in the use of measures of vocabulary size, more research is needed in what is and is not measured by these assessments. Since vocabulary size has positively been correlated with reading proficiency (Baleghizadeh & Golbin, 2010), some test users may assume that the terms are interchangeable and may use vocabulary

size tests for purposes beyond what is intended or supported by evidence.

One of the more well-known vocabulary proficiency measurements is the Vocabulary Size Test (VST), which was introduced in 2007 by Paul Nation and David Beglar. Various versions and translations of the VST have evolved since its introduction. A great deal of research supports the VST, and it has been shown useful in a variety of situations.

The VST was created to measure vocabulary knowledge of the 14,000 most frequently used word families in the British National Corpus (BNC). The VST uses a multiple-choice format to measure receptive vocabulary knowledge. Although the VST is explicitly not a measure of reading proficiency, some of the supporting data suggesting that a vocabulary size of 9,000 words is sufficient to be a proficient reader of newspapers or novels might give the impression that knowing those words will result in the reading proficiency necessary to comprehend these texts.

The VST seems to be particularly well-known among English teachers and researchers in Japan. The first version of the VST was introduced in a Japanese publication for English teachers, *The Language Teacher* (Nation & Beglar, 2007). Since the introduction of the original VST, many bilingual versions, including a Japanese version introduced in 2010, have followed. The instructions for the VST indicate that the bilingual version is preferred to the monolingual version when possible, given that the monolingual version may also include English grammar in the question prompts which may complicate the measure of vocabulary knowledge (Nation, 2012).

Consequently, this study was carried out to examine the degree to which performance on a bilingual Japanese version of the Vocabulary Size Test could predict performance on a standardized reading comprehension test.

### 3. Reading Proficiency and Vocabulary

The TOEFL ITP test is well known to many university students preparing to take university courses in English. The reading section includes multiple choice questions with questions testing various reading skills. Tests were taken in a timed setting following official

protocol for the TOEFL ITP. In addition to the TOEFL ITP, scores were collected from the GTEC reading section. This test was untimed and was able to be completed at home.

#### 4. Research Questions

The purpose of this study is to investigate the relationship between vocabulary size and reading comprehension of first-year students enrolled in the International Professional Development program (IPD) at Kansai Gaidai University. This study attempts to address the following research questions:

- 1) To what extent do scores on the JBVST test predict performance on the reading portion of the TOEFL ITP test?
- 2) To what extent do scores on the JBVST test predict performance on the reading portion of the GTEC?

#### 5. Method

##### 5.1 Participants

Participants in this study included 100 students enrolled in the IPD Program at KGU. The IPD Program consists of both first and second-year students; however, only first-year students were selected due to the fact that all IPD students are expected to participate in a study abroad program after achieving a sufficient score on the TOEFL exam. As a result, it is possible for there to be a wide range of proficiency among students first entering the program as a recent high school graduate and students who are near completing their second year. The difference is even greater among those who have already participated in study abroad.

Although first-year students are technically at the same level in terms of the instruction they receive, they are placed into classes according to their proficiency levels as determined by the GTEC exam. CA1 represents those students who have scored the highest on the GTEC, and CA6 represents students who scored the lowest.

##### 5.2 Instrument

The three instruments used in this study were the JBVST, TOEFL ITP, and GTEC exams.

The JBVST is the Japanese Bilingual version of the Vocabulary Size Test, which is used to measure the students' vocabulary size by arranging words into word families. According to Bauer & Nation (1993), this allows for a more accurate estimation of vocabulary size because it avoids over counting words that have multiple forms.

The TOEFL ITP is the paper-based test and was administered as an institutional TOEFL exam that all students at KGU are required to take. The GTEC was taken online as part of the placement process in the IPD Program. Both tests are subcategorized by reading comprehension scores. Only the reading comprehension scores were used as a measure of correlation in this study.

### 5.3 Procedure

The JBVST was administered to all of the students on the same day during multiple sessions throughout the day. Students were given the same amount of time during each session to complete the test. They were also given a short explanation about what the test attempted to measure and that their scores would likely correlate to their reading comprehension scores on the TOEFL and GTEC.

A total of 105 students sat for the test; however, the test results of four students were omitted because their scores were unavailable at the end of the testing period. In addition, one student's scores were omitted from the results due to incorrectly recording answers on the answer sheet.

## 6. Results

### 6.1 Descriptive Statistics

The results of the JBVST, TOEFL, and GTEC tests are presented in Table 2. The mean for the JBVST ( $m=8057$ ) suggests that the average student has a vocabulary of over 8000 words ( $SD=981.161$ ). According to Nation & Beglar (2007), this is enough to read newspapers and magazines.

However, the average TOEFL scores ( $m=49.21$   $SD = 4.411$ ) suggest that students are reading at a different level of proficiency (TOEFL ITP, 2014). These results suggest that students can

understand high frequency vocabulary and sentences with common conjunctions (i.e. for, and, but, so), but they lack knowledge of standard or low frequency academic vocabulary and are likely unable to follow abstract topics or discourse at the idea level.

**Table 2.**

Instrument	No. of Students	Mean	Standard Deviation	Standard Error
JBVST	100	8057	981.161	98.116
TOEFL	100	49.21	4.411	.441
GTEC	100	137.39	20.051	2.005

## 6.2 Research Questions

The first research question asks to what extent do scores on the JBVST test predict performance on the reading portion of the TOEFL ITP test. A Spearman's rank order correlation was run to show this relationship. As Table 3 indicates, there is a weak to moderate ( $r = .313$ ) correlation between performance on the JBVST and the reading portion of the TOEFL exam. The relationship is statistically significant at  $p < 0.01$ . According to Cohen (1992), the sample size is sufficient to find a correlation between these tests.

**Table 3.**

			JBVST	TOEFL
Spearman's rho	JBVST	Correlation Coefficient	1.000	.313
		Sig. (2-tailed)		.002
		N	100	100
	TOEFL	Correlation Coefficient	.313	1.000
		Sig. (2-tailed)	.002	
		N	100	100

Correlation is significant at the 0.01 level (2-tailed).

Table 4 reports the results of the second research question, which asks to what extent the JBVST test predicts performance on the reading portion of the GTEC exam. A Spearman's rank order correlation was also run to explore this relationship. Although the results suggest that there is a positive correlation between the JBVST and the GTEC, the relationship is weak ( $r = .201$ ). This result is statistically significant at  $p < 0.05$ .

Table 4.

			JBVST	TOEFL
Spearman's rho	JBVST	Correlation Coefficient	1.000	.201
		Sig. (2-tailed)		.045
		N	100	100
	GTEC	Correlation Coefficient	.201	1.000
		Sig. (2-tailed)	.045	
		N	100	100

Correlation is significant at the 0.05 level (2-tailed).

## 7. Discussion

The purpose of this study was to explore the relationships between vocabulary size and reading comprehension skills of students enrolled in the IPD Program at Kansai Gaidai University. To investigate these relationships, we examined test scores from the JBVST, the TOEFL ITP, and the GTEC. Based on students' performance on these exams, three important findings emerged.

The first finding was that the students' level of reading proficiency is inconsistent when examining the mean values on the JBVST ( $m=8057$ ) and the TOEFL ( $m=49.21$ ). Although the JBVST is a test that measures a student's vocabulary size, various connections between vocabulary size and reading proficiency suggest that one can use it to estimate a learner's reading level. According to this estimate, students should be able to read newspapers and magazines. However, students' TOEFL scores suggest that they are likely unable to comprehend a text on this level, as they lack knowledge of standard or low frequency academic vocabulary and may not be able to follow abstract topics or discourse at the idea level (TOEFL ITP, 2014).

Another important finding is that there is a positive relationship between scores achieved on the JBVST and the reading portion of the TOEFL ITP. This suggests that, as a student's vocabulary scores increase on the JBVST, the reading scores on the TOEFL are also likely to increase. However, while this correlation is positive, they share only a weak to moderate correlation ( $r=.313$ ). This result is surprising given that strong vocabulary skills are such an important component of strong reading skills. This result is statistically significant at  $p<0.01$ .



The third finding is that there is an even weaker correlation between the JBVST and the GTEC reading scores ( $r=.201$ ). This result is statistically significant at  $p<0.05$ .

There are several possibilities that may account for these discrepancies. First, Gyllstad, Vilkaite & Schmitt (2015) suggest that similar tests that attempt to measure vocabulary size through a multiple choice format, like the VST, are overestimating a test taker's final scores because there is no option for them to indicate when they do not know the answer. This forces the test taker to guess, which results in a higher score. Related to this is a study by McDonald (2015), suggesting that bilingual versions of the VST are more sensitive to the known vocabulary. Laufer and McLean found that the presence of loan words on Vocabulary size measures did seem to affect scores of lower-level test takers (2016). If, for example, loan words are not taken into account on the bilingual versions of the VST, it gives credit for knowing 100 words to test takers for each word correctly guessed. If the scale of vocabulary knowledge is from 1000-14,000, then even a 10% difference is significant. This guessing has the effect of inflating a student's vocabulary size, which further results in an overestimation of their reading comprehension level.

## 8. Conclusion

Vocabulary Size Tests have been successfully tied to reading comprehension; however, such tests in their current form may be overestimating the actual size, and by extension, a student's level of reading ability. Suggestions have been made to account for these issues. An "I don't know" choice has shown promise as a possible remedy for inflated vocabulary sizes due to guessing (McDonald & Asaba, 2016). In addition, test takers could be told to sit only 1 or 2 levels above the test takers' ability (Matte, 2016). This could be done instead of completing all of the items, which might inflate scores as a result of guessing. Finally, the English vocabulary in the prompts on the JBVST could be researched more for the potential of inflationary effects of cognates on the JBVST.

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