

## Rational Cloze Test: A Valid Measure of Vocabulary?\*

### ข้อสอบแบบเติมคำ: เครื่องมือวัดความรู้ด้านคำศัพท์ที่เที่ยงตรง?

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#### Abstract

The study aimed to 1) determine whether the rational cloze test claimed to test vocabulary really measured vocabulary, 2) explore relationships between the rational cloze test scores and the scores on vocabulary, grammar and reading comprehension, and 3) find out the significant predictors of the rational cloze test scores. The subjects were 104 grade 12 EFL students selected by purposive sampling technique. The research instruments were the rational cloze test, vocabulary test, grammar test and reading comprehension test. The findings showed that the average score of the rational cloze test was significantly lower than that of the vocabulary test. Moreover, it was found that there was a positive significant relationship between scores of the rational cloze test and scores on vocabulary, reading comprehension and grammar. Regression analysis revealed that vocabulary and grammar were the significant predictors of the scores on the rational cloze test.

การวิจัยครั้งนี้มีจุดประสงค์เพื่อ 1) ศึกษาความเที่ยงตรงของแบบเติมคำที่ใช้เป็นเครื่องวัดความสามารถด้านคำศัพท์ 2) ศึกษาความสัมพันธ์ระหว่างคะแนนที่ได้จากข้อสอบแบบเติมคำและคะแนนที่ได้จากข้อสอบวัดความสามารถด้านคำศัพท์ ไวยากรณ์ และการอ่านทำความเข้าใจ และ 3) ศึกษาปัจจัยบ่งชี้ที่สำคัญของคะแนนที่ได้จากข้อสอบแบบเติมคำ กลุ่มเป้าหมายเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 6 จำนวน 104 คน เลือกโดยการสุ่มตัวอย่างแบบเจาะจง เครื่องมือวิจัยประกอบด้วย ข้อสอบแบบเติมคำ ข้อสอบวัดความสามารถด้านคำศัพท์ ข้อสอบวัดความสามารถด้วยไวยากรณ์ และข้อสอบวัดความสามารถด้านการอ่านทำความเข้าใจ ผลการวิจัยพบว่า คะแนนเฉลี่ยที่ได้จากข้อสอบแบบเติมคำ ต่ำกว่าคะแนนที่ได้จากข้อสอบวัดความสามารถด้านคำศัพท์อย่างมีนัยสำคัญ นอกจากนี้ ยังพบว่าคะแนนที่ได้จากข้อสอบแบบเติมคำมีความสัมพันธ์เชิงบวกกับคะแนนที่ได้จากข้อสอบวัดความสามารถด้านคำศัพท์ ด้านไวยากรณ์ และด้านการอ่านทำความเข้าใจอย่างมีนัยสำคัญ ส่วนการวิเคราะห์การทดสอบพบว่า ความสามารถด้านคำศัพท์และไวยากรณ์เป็นปัจจัยบ่งชี้ที่สำคัญของคะแนนที่ได้จากข้อสอบแบบเติมคำ

**Keywords:** Rational Cloze Test, Vocabulary Test, Validity

\* This article is conducted to investigate the validity of rational cloze test as a test of vocabulary and to fulfill the requirement for M.A. in Teaching English as a foreign language, Prince of Songkla University.

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## 1. Rationale

The main objective of language tests is to measure the real language performance of the test takers; tests play an important role in indicating learners' language achievement (Heaton, 1988; McNamara, 2000). To ensure the test quality, construct validity needs to be considered. Construct validity is concerned with meaningful and appropriate interpretations based on the test scores. According to Bachman (2009), what the test tests has to reflect what it is aimed to test from the individuals. The validation in language testing aims to ensure defensible and fair interpretations based on test performance (McNamara, 2000). Test validity must show a strong relationship between the test scores and the ability of the individuals (Fulcher, 2007). This helps to provide a reliable test score. If no processes of validation are available in test construction, there will not be justice in test score results. The tests will be useless if they lack validity (Hughes, 1989). Thus, developing and understanding the principles of language assessment are necessary (McNamara, 2000).

According to Prapphal (2008), in Thailand there are still problematic issues in language testing. One of the great concerns is the issue of test validity. In the Thai educational system, Ordinary National Educational Test (O-NET) is conducted in order to assess learners' quality at national level, based on the learning standards prescribed in the Basic Education Core Curriculum. The National Institute of Educational Testing Service (NIETS) is responsible for arranging for assessment of all learners in three educational levels: primary (grades 1-6), lower secondary (grades 7-9) and upper secondary (grades 10-12). The evaluation results will provide relevant data for comparing educational quality at different levels, which will be useful for planning in order to raise the quality of education provided. The data obtained will also support decision-making at the national policy level (Ministry of Education, 2008).

In the current global society, communication technology connects every part of the world (Kuljitjuewong, 2012). When the world becomes smaller, languages are necessary. Thai students need to learn foreign languages because of its importance, not only for communication, but also for seeking knowledge and creating understanding of cultures of the world community. The foreign language constituting basic learning content that is prescribed for the entire basic education core curriculum is English (Ministry of Education, 2008).

English is one of the eight subjects assessed in O-NET. The English skills assessed in the O-NET test are language for communication, language and culture, language and other subject groups relationship, and language, community and work relationship. Each year approximately two million Thai students take the O-NET examination: 950,000 grade six

students, 880,000 grade nine students and 330,000 grade twelve students. The O-NET scores are important especially for grade 12 students because it is part of their university admission to continue their specific study in the future (National Institute of Educational Testing Service, 2009). For example, in Thai higher education, communication skills are needed such as in Hotel English Training Program (Taraporn et al., 2014).

Vocabulary is a significant component for communication. It is an achievement indicator of language use. Wilkins (1972:111 cited in Schmitt, 2010) said “Without grammar very little can be conveyed, without vocabulary nothing can be conveyed.” In language learning, vocabulary needs to be measured (Hall, 2012). A vocabulary test assesses learners’ knowledge of the lexical meanings, patterns and collocations in a context. Both learners’ active vocabulary and passive vocabulary may be tested.

A vocabulary completion test is employed in measuring vocabulary knowledge both in the classroom and at the national level. This format modified from the traditional or systematic deletion cloze test is referred to by many researchers as a gap-filling reading test, a rational cloze test and a selective deletion cloze test (Heaton, 1988). To complete the rational cloze test, the test takers need the grammatical knowledge and reading competence (Lee, 2008; McKamey, 2006; Yamashita, 2003; Saito, 2003; Hadley and Naaykens, n.d.).

Accordingly, it is necessary for this research to investigate the validity of the rational cloze test claimed to test the test takers’ vocabulary proficiency and the relationship between the sets of scores from the rational cloze test, reading comprehension test and grammar test.

### **Research Questions:**

1. Does the rational cloze test claimed to test vocabulary really measure vocabulary?
2. Are there relationships between the scores of the rational cloze test and those on vocabulary, grammar and reading comprehension test?
3. Which variables are significant predictors of the rational cloze test scores?

## **2. Literature Review**

### **2.1 Importance of Vocabulary**

Vocabulary plays important roles in all English language skills. Vocabulary significantly relates to reading, writing, listening, and grammar (Schmitt, 2010). Knowledge of vocabulary can account for the success of communication. Lack of grammar knowledge does not affect achievement of communication, but the communication will be meaningless if there is no vocabulary (Wilkins, 1972 cited in Schmitt, 2010). Learners always perceive the importance of

vocabulary and master their vocabulary through language learning (Lessard-Clouston, 2013). The lexical performance of learners can be measured on any language test to establish their vocabulary size.

## 2.2 Testing Vocabulary Performance

A vocabulary test is designed to test the students' lexical knowledge and the test has to be able to discriminate the students' word proficiency (Heaton, 1988). According to Nation (2008), testing vocabulary is a way to see the ability of the learners' vocabulary development in order to further the pedagogical plan and stimulate their learning. Vocabulary testing can be used to clarify what needs to be instructed, to observe and encourage learning, to place students in the right class, to assess students' achievement by giving a grade, and to assess students' vocabulary size or proficiency. The vocabulary test scores have to represent the students' lexical ability (Nation, 2008).

Vocabulary tests can be classified as productive vocabulary tests of which test takers must go from meaning to the word form and receptive vocabulary tests of which test takers see the word form and have to find the meaning (Nation, 2008). In fact, vocabulary can be tested in four skills of English: speaking, listening, writing and reading. If the learners perform a productive vocabulary test well, they may be good at the skills of speaking and writing. If the learners perform a receptive vocabulary test well, they may be good at the skills of listening and reading (Heaton, 1988).

There are several ways to test vocabulary. A vocabulary test can be in the format of multiple-choice items asking test takers to select the nearest meaning, the definition or the best synonym with the given word, make a set of associated words, or match items. The formats of word formation test items, rearrangement items and completion items are also used in testing lexical knowledge (Heaton, 1988). Linking vocabulary items with other tests may help discover how well students can apply the vocabulary they have been taught (Nation, 2008).

A good vocabulary test needs to have certain characteristics. Firstly, it should be practical. Nation (2008) said that the test takers should not spend a long time or use various skills in the test. The test has to be easily marked and scores on the test should be easily interpreted. In addition, the test should be reliable, consisting of at least 30 items. Test takers should be familiar with the test format. Finally, it should be valid. The test must test what it is supposed to test. The test becomes valid if it is used for the objective for which it is planned. Test takers have to use knowledge and skills involved in the vocabulary knowledge being measured to take the test (Nation, 2008).

### 2.3 Rational Cloze Test

A cloze was introduced by Taylor in 1953 who deleted words in a passage systematically. Its first use was for testing reading competence of American school students. It is widely used to measure English proficiency of both ESL and EFL learners because of its advantages in measuring the integrative skills and being easy to construct (Oller and Conrad, 1971).

Hughes (1989) proposed that the cloze test draws on the candidate's ability to process lengthy passages of language in order to replace the missing word in a blank. To predict the missing word, test takers employ the underlying abilities of their language competence.

At least five major types of cloze tests are available in language testing: the fixed-rate deletion, the multiple-choice cloze, the cloze elide, the C-test and the selective deletion, also known as the rational cloze (Hadley and Naaykens, n.d.). In the fixed-rate deletion, every nth word is deleted after the first or second sentences of the text. Often every fifth or seventh word is deleted. In multiple choice cloze tests, test takers select from possible items to fill in each blank. The cloze elide includes words which are not relevant to the text. The test takers have to identify the wrong words and correct them. The C-test is composed of words of which the initial part is kept in a text, and each shortened word is completed by test takers. The selective deletion or rational cloze test is one in which the tester deletes words that he or she wants to assess from the text (Eyckmans et al., 2004). This type of test is to assess specific points of grammar and vocabulary (Hadley and Naaykens, n.d.)

The rational deleted cloze test was first developed by Bachman to assess the specific linguistic performances of the learners in reading (1985, cited in Lee, 2008). The deleted words could be a grammatical word or a content word. For Davies et al. (1999), in a rational cloze, words are deleted and selected by the teachers or test administrators. The students are required to fill functional words or content words depending on whatever being tested.

Lee's study (2008) suggested that rational cloze procedure could encourage a learner's vocabulary acquisition because it reinforces using words rather than putting emphasis on words to learn the meanings. It was found that the rational cloze procedure improved knowledge in written text form which the learners read and comprehended by using their semantic and syntactic knowledge.

However, the validity of cloze tests has been criticized by many researchers. For example, Kobayashi's study (2002) claimed that the cloze item characteristics impacted the cloze test scores even though cloze tests have been used to measure various kinds of language proficiency. Those item characteristics involved the deleted word type, frequency of word deletion, the grammatical variation, the quantity of context and background knowledge. McNamara (2000) mentioned that it is hard to use the cloze procedure as an accurate predictor of test takers' separate language skills performance. Different score results from the cloze test vary with the chosen texts. In addition, intelligent test takers can easily predict the missing words in a cloze test. Therefore, the validity of cloze technique in language testing is called into question.

#### **2.4 Validity**

Validity is of two types of quality. A unitary quality relates to the sufficient and suitable interpretations and uses of test scores. Another quality is a local quality specified to a particular inference or use of a particular test. Valid language test scores can infer test takers' knowledge and performance and place them into courses. To ensure those results, the testers must supply enough justification. The testers have to prove them with reasonable discussion and obvious evidence to make the expected score interpretation valid (Bachman, 2004).

Validation is the means of combining an interpretive statement relating a test score with its interpretation and use, and gathering relevant proof to support discussion (Bachman, 2004). Validation can be demonstrated by qualitative and quantitative approaches. Qualitative approaches include analysis of test content and of the process that test takers use in taking tests. Quantitative approaches consist of analysis of patterns of correlations among many different tests, using exploratory and confirmatory factor analysis, as well as experimental, equivalent group designs and comparisons among non-equivalent groups (Bachman, 2004).

Construct validity is an important kind of validity in language testing. It is the concept that the test has to test what the test taker aims to test (Davies et al., 1999). For Hughes (1989), construct validity refers to a testing technique that demonstrates the test is measuring only the competence which it is assumed to measure. The term "construct" involves any trait or underlying ability hypothesized in a theory of language ability. A good test should contain construct validity in order to supply and predict an accurate and reliable result of the knowledge proficiency measured in it (Bachman, 1990). In order to validate the test constructs, coefficients can be calculated between the various measures of language ability. If the coefficients between sets of scores on a similar construct are consistently higher than those between the scores on different constructs, the evidence is claimed that the test measures

isolate constructs. Direct testing of abilities is recommended if there is unclear and doubtful explanation in the test constructs (Hughes, 1989).

### **3. Methodology**

#### **3.1 Subjects**

The subjects in this study were 104 Grade 12 EFL learners from Dechapattana yanukul School, Pattani, Thailand. They were selected by purposive sampling technique.

#### **3.2 Research instruments**

##### **3.2.1 Rational cloze test**

The rational cloze test was used to assess the vocabulary knowledge of the subjects. The test was taken from three years of O-NET tests at the upper-secondary level: 2009, 2010, and 2011. The rational cloze test was in a four-multiple-choice format composed of 30 items. It was required to read cloze passages and select suitable and meaningful words for each gap in the contexts. The reliability coefficient of this test was .80.

##### **3.2.2 Vocabulary test**

A vocabulary test was constructed to measure the subjects' vocabulary knowledge. It consisted of 30 multiple-choice items which were the same words tested in the rational cloze test (as in 3.2.1). The reliability coefficient of this test was .89. The subjects had to choose the correct meaning for each given word. This kind of test is a single word test not requiring other English language skills except the knowledge of vocabulary.

##### **3.2.3 Grammar test**

The grammar test was used to investigate the subjects' grammar knowledge. This test consisted of 30 grammatical error identification items taken from 2009, 2010 and 2011 O-NET tests of the upper-secondary level. The reliability coefficient of this test was .83.

##### **3.2.4 Reading comprehension test**

A reading comprehension test was employed to investigate the test takers' reading ability and was taken from the upper-secondary O-NET tests of 2009, 2010 and 2011. It consisted of three passages with different lengths. There were 27 four-multiple choice items. The reliability coefficient of this test was .79.

All these four tests had already been piloted with 40 Grade 12 students before use.

### **3.3 Data Collection**

The tests were administered to the 104 subjects. The subjects first sat for the rational cloze test for 30 minutes. After the rational cloze test had been collected, the vocabulary test was administered for 20 minutes. Then, the grammar test and the reading

comprehension test were administered. Together all the four tests took approximately 150 minutes to administer.

### 3.4 Data Analysis

Descriptive statistics were used to describe the subjects' scores on four tests: rational cloze test, vocabulary test, grammar test and reading comprehension. Then, Pearson correlation coefficient was applied to explore relationships between scores on the rational cloze test and other sets of the scores. Finally, regression was applied to find the most significant variable in predicting scores on the rational cloze test.

## 4. Results

**Research Question 1:** Does the rational cloze test claimed to test vocabulary really measure vocabulary?

Table 1 Comparison of test scores

Test	N	Total	Mean	S.D.	Max.	Min.
Rational Cloze Test	104	30	10.72	4.30	27	4
Vocabulary Test	104	30	18.42	4.94	30	10
Grammar Test	104	30	9.28	3.54	23	2
Reading Comprehension	104	27	10.58	4.46	25	4

Table 1 shows the means of the four tests: the rational cloze test, vocabulary test, grammar test and reading comprehension test. It is found that the scores on the vocabulary test were the highest ( $\bar{x} = 18.42$ , S.D.=4.94) followed by rational cloze test scores ( $\bar{x} = 10.72$ , S.D.=4.30), reading comprehension scores ( $\bar{x} = 10.58$ , S.D.=4.46) and grammar test scores ( $\bar{x} = 9.28$ , S.D.= 3.54) respectively.

The vocabulary knowledge of the subjects was assessed by the two test types: vocabulary test and rational cloze test. The results revealed that the subjects' vocabulary scores on the vocabulary test ( $\bar{x} = 18.42$ , S.D.= 4.94) were higher than those on the rational cloze test ( $\bar{x} = 10.72$ , S.D.= 4.30). The maximum and minimum scores of the vocabulary test (Max. = 30, Min. =10) were obviously higher than those of the rational cloze test (Max. = 27, Min. = 4). It seems that the subjects knew the vocabulary tested well because they could identify the words when tested through single words in the vocabulary test. They did need to read or employ any underlying abilities. However, when they did the rational cloze test, they

had to read the contexts. Thus, their vocabulary competence was obstructed by the rational cloze test.

**Research Question 2:** Are there relationships between the scores of the rational cloze test and those on vocabulary test, grammar test and reading comprehension test?

**Table 2 Correlation scores of all tests**

	Rational Cloze Test	Vocabulary Test	Grammar Test	Reading Comprehension
Rational Cloze Test		.470 **	.213 *	.315 **
Vocabulary Test			.058	.346 **
Grammar Test				.254 **
Reading Comprehension				

\*\*. significant at the 0.01 level (1-tailed).

\*. significant at the 0.05 level (1-tailed).

As can be seen from Table 2, the scores on the rational cloze test were significantly and positively correlated with the vocabulary scores, reading comprehension scores and the grammar scores. To begin, the scores on the rational cloze test were significantly and moderately related to the vocabulary test ( $r = .47$ ,  $p < .01$ ). The higher the vocabulary test scores were, the higher the rational cloze test scores were. In other words, the two sets of tests measured the same construct. This implies that a larger vocabulary enabled students to increase their scores on the rational cloze test.

Also, there was a low but significant correlation between scores of the rational cloze test and those of the grammar test ( $r = .21$ ,  $p < .05$ ), suggesting that the students with high grammar knowledge would also score high on the rational cloze test and vice versa.

In terms of the relationship between the rational cloze test and the reading comprehension test, the analysis indicates that there was a positive and significant correlation ( $r = .32$ ,  $p < .01$ ). Those learners who had better scores on the rational cloze test would also have better reading comprehension scores and vice versa.

To confirm the correlations between the sets of scores, regression was performed as shown in Table 3.

**Research Question 3:** Which variables are the significant predictors of the rational cloze test scores?

**Table 3 Multiple regression for the relationship between scores on the rational cloze test and scores on the vocabulary and grammar test**

Model	R	R Square	Std. Error of the Estimate	F	Sig.
1	.505	.255	3.749	17.324	.000

Independent variables: Vocabulary and Grammar

Dependent variable: Rational Cloze Test

In order to examine the strength of the relationship, the model's R-Square value was calculated as shown in Table 3. The model summary reveals that 26 percent of the variance (R-Square = .255) in the rational cloze test scores can be attributed to the competence of vocabulary and grammar. Thus, from these results, it can be inferred that vocabulary and grammar competence can significantly predict up to 26 percent of the variance in the scores on the rational cloze test ( $F=17.32$ ,  $p<.01$ ).

**Table 4 Partial regression coefficients for the degree of prediction of vocabulary, grammar and reading comprehension on the rational cloze test scores**

Variables	B	Std. Error	Beta	t	Sig.
(Constant)	1.254	1.680		.746	.457
Vocabulary	.400	.075	.459	5.338	.000
Grammar	.226	.104	.186	2.168	.033

To determine which of the three variables under investigation could significantly predict the outcome on the rational cloze test scores, Table 4 presents the variance breakdown for each of the variables. These results show that only vocabulary and grammar could significantly predict the outcome on the rational cloze test scores ( $p<.01$  and  $p<.05$  respectively). However, beta indices reveal that scores on the vocabulary test were a stronger predictor and had a stronger effect on the rational cloze test scores (0.46) than scores on the grammar test (0.19). This means, with all the variables held constant, for every unit increase in the level of vocabulary knowledge, the rational cloze test scores increased by .46 unit. Another predictor of the rational cloze test scores was grammar knowledge with Beta = .19. This, again, means that there was an increase in the rational cloze test scores by .19 for every extra point in the level of grammar knowledge.

Surprisingly, reading comprehension was not included in the regression model for predicting rational cloze test scores in this study. It means that the reading comprehension did not predict and affect the scores on the rational cloze test.

With respect to the above results, one can say that vocabulary and grammar knowledge were the significant predictors of the rational cloze test scores.

## 5. Discussion

The aims of the present study were to determine whether the rational cloze test claimed to test vocabulary really measured vocabulary; to explore relationships between the scores on rational cloze test and the vocabulary, grammar and reading comprehension scores; and to find out the significant predictors of the rational cloze test scores.

This study finds that the rational cloze test and the vocabulary test measured the same construct, but the overall scores of vocabulary measured by the two test formats were different. The subjects scored higher in the vocabulary test than in the rational cloze test. This implies that even though the two tests assessed vocabulary knowledge, the vocabulary test seemed more valid because it tested only vocabulary knowledge. The rational cloze test required them to apply their grammar knowledge and reading competence in order to select the correct words. To illustrate, the rational cloze test scores were significantly and moderately related to the vocabulary test scores ( $r = .47$ ). This suggests that in doing the rational cloze test, the students needed not only vocabulary knowledge but also other underlying skills. There might be other English language abilities affecting the vocabulary tested by the rational cloze test.

The scores on the rational cloze test were also positively correlated with the reading comprehension and grammar tests. The relationships were quite low ( $r=.32$  and  $r=.21$  respectively). It implies that not only vocabulary knowledge, but that the rational cloze test could assess the reading comprehension and grammar ability of the students. This study corresponds to the research of McKamey (2006) who stated that the scores of the rational cloze test are correlated with the scores of grammar and reading test. It means that what the rational cloze test measures is the homogeneous ability that grammar tests, vocabulary tests and reading comprehension tests assess (Saito, 2003).

However, Hall (2012) argued that even though vocabulary competence is correlated with the ability of the reading texts, testing vocabulary by using text clues does not validly assess the students' vocabulary proficiency because the skill of reading interferes with the

performance. Heaton (1988) also said that the effective vocabulary tests should not rely on the students' grammatical knowledge to comprehend the test items or complete the test

In order to ensure the relationships between the sets of scores, regression was applied. It is surprising that the reading comprehension test was left out of the regression model by chance. It probably suggests that reading comprehension did not predict rational cloze test performance while vocabulary and grammar contributed significantly to the prediction of the rational cloze test. Not only vocabulary but also grammar knowledge was a significant factor affecting the scores on the rational cloze test. It is interesting to note that to restore the blanks in the rational cloze test, test takers must have both vocabulary and grammar knowledge. However, the knowledge of vocabulary played the most significant role in predicting the scores on the rational cloze test. This finding is not consistent with the study of McKamey (2006) showing that grammar and reading comprehension are good indicators of the rational cloze test performance.

Therefore, we can conclude from this study that vocabulary is a significant contributor to the rational cloze test performance, but its contribution is not unique. Grammar and reading comprehension seem to overlap in the rational cloze test.

## 6. Conclusion

Based on the findings of this study, it could be summarized that the rational cloze test was valid for measuring the vocabulary knowledge of the students, but it was not as valid as the vocabulary test because of its relation with grammar test and reading comprehension test. It means that the rational cloze test did not only measure vocabulary knowledge but also grammar and reading comprehension. The students who have high grammar and reading comprehension competence could do better on the rational cloze test than those who have only vocabulary knowledge. School teachers should take this into consideration for test design. Not only teachers, but also students, can benefit from the results on the performance of the rational cloze test. For further study, because of low correlations between the rational cloze test and other sets of English language performance, a future study should repeat other different variables that play a significant role in the rational cloze test and increase the number of samples from different schools in order to generalize the results.

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