Correlation between Shinshu University Freshmen's Oral Reading Performance and Reading Comprehension

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1   Introduction

There has been substantial research regarding the correlation between reading comprehension and oral reading at the early stage of language learning. However, little research has been done by language researchers regarding how oral reading contributes to the development of reading comprehension of adolescents and adults.

Historically much attention is paid to the value of silent reading in the field of language acquisition (Kuzborska, 2011) and considerable research has been carried out to emphasize the importance of silent reading, which contributes to understanding the ideas of the writer in academic contents. On the other hand, the effect of oral reading was often thought to be associated with phonetic recognition and decoding of the written text. Rasinski (2004) stated that oral reading is one of the reading skills which affects how well readers comprehend what they read. White (1995) also mentioned that once students become fluent in oral reading, their reading energy will be put on comprehension, rather on decoding, and it will lead to them being better readers who can analyze, interpret, and draw conclusions from their reading.

2   Study Objectives

A lot of research has proven that oral reading facilitates learner's skills of decoding and word recognition. This research will examine how oral reading performance of university students affects their reading comprehension. To conduct the study, 120 Shinshu University freshmen in 2010 were involved and their oral reading performance and reading comprehension were tested respectively. Much of the research method of this study was adapted from "Fourth-Grade Students Reading Aloud: NAEP 2002 Special Study of Oral Reading" (hereafter the "NAEP 2002" study) conducted by the National Center for Education Statistics in the United States in 2002.

To obtain both quantitative and qualitative information of freshmen's oral reading performance, the oral reading testing was conducted in week 13 of the first semester in 2010. In addition, students took the written exam in week 15 to be assessed with their reading comprehension.

The results from the oral reading test and the data given from the reading comprehension test were used to find the correlation between freshmen's oral reading performance and reading comprehension.

3   Rationale: Is it applicable to adapt the criteria and scales of the "NAEP 2002" study to assess Shinshu University freshmen's oral reading performance?

The NAEP 2002 study was designed to test oral reading performance of fourth-grade students in the US. Though there are great differences between the process of English language acquisition of Japanese university students and American fourth-graders, it was thought to be appropriate to employ the NAEP 2002 study to evaluate freshmen's oral reading performance as well.

As a rationale for an adaptation of the NAEP 2002 study to testing Shinshu University freshmen's oral reading performance, a pilot study was conducted to assess the reliability of the criteria and scales (see Table 2) set in the NAEP 2002 in week 3. The teacher measured the approximate students' reading rate and accuracy in class, and most of the students' results fell into the setting range. Given that, it was decided that adapting the NAEP 2002 study would be appropriate to assess freshmen's oral reading performance.

4   Method

4.1 Participants

This study involved 120 (61 male, 59 female) Shinshu University freshmen, majoring in agriculture, engineering, economics, and health science. There were 115 Japanese students and five overseas students (two Chinese, two Vietnamese, and one Korean) among them.

Prior to the first semester of 2010, all the freshmen in Shinshu University were divided into three levels (A= advanced, B= intermediate, and C=basic) to decide which level of the English course they were required to take. All the participants for this study fell into the C (=basic) level.

Agriculture and Engineering students took the "Comprehensive English 1A" course in which

students learn to develop their reading and writing abilities while economics and health science students took the "Academic English 1A" course where students also develop reading and writing skills. The teacher who conducted this research was in charge of teaching all of the above four classes.

4.2 Materials

Reading Explorer 1 published by Heinle, Cengage Learning was chosen as the main textbook for the above-mentioned four classes. This textbook was thought to be an appropriate textbook for students not only to develop the oral reading skill but also to train multiple tasks related to reading skills. According to *Reading Explorer 1 Teacher's Guide,* the textbook was designed to develop learners' multiple reading skills such as vocabulary building, critical thinking, enhancing visual literacy, and so forth (Douglas and Hubley 2010). *Reading Explorer 1* is published together with a supplementary student CD-ROM which contains reading passages, vocabulary activities, and video clips for self-study purposes.

The vocabulary used in the textbook was considered to be the appropriate level since most of the words used in the textbook had already appeared in major English textbooks used at high schools. Each passage included approximately 250 words. With its vocabulary covered, passage length and supplementary materials, Reading Explorer 1 was thought to be a suitable textbook for this study.

4.3 Classroom Environment

In general, teachers have great control over the classroom environment in which students learn (UNESCO 2006). For this study, the teacher chose the computing room as the suitable studying classroom in which each student could use a computer with internet access. Three out of four classes (agriculture, engineering, and health science) were organized in the computer room. However, due to the availability of computer rooms, only the engineering class had to be taught in a regular lecture room with no computer provided to each student. The teacher uploaded all the audio files of model reading to each class website allocated by Shinshu University e-learning center. This enabled students to access to model reading through their subject website in the computer room, at home or where internet access was available.

5　Preparations for Oral Reading

UNESCO Asia and Pacific Regional Bureau for Education (2006) reports that when a willing and enthusiastic teacher helps students learn, students became aware of the importance of their

learning and scored better. It is the teacher's role to prepare effective and well-managed lessons using a variety of teaching strategies. Teachers are required to carefully plan a course outline, set up the target goal of the course, and decide the means of feedback and evaluations to maximize the benefits to students.

Out of 15 90-minute lessons taught in the first semester of 2010, eight were reading-oriented lessons and oral reading testing. The remaining seven lessons were used for other activities such as the introduction of the course, writing practice, shadowing testing, the written exam and course feedback that were partially or totally irrelevant to the scope of the study.

For the oral reading testing, nine passages from six units in *Reading Explorer 1* were chosen. Six units were covered during the first semester of 2010 and the remaining units were taught in the second semester. Every week students studied one or two reading passages out of the nine passages and practiced to read aloud the above-mentioned nine passages in class with model reading. Prior to being tested for the oral reading testing, students took the following steps (see Table 1) to learn each passage.

Table 1: Preparations for oral reading

PREPARATIONS FOR ORAL READING	
1. Pre-reading activities	Pre-reading activities ("Warm Up" and "Before You Read" in the textbook) ↓
2. Target vocabulary	Introduction to the target vocabulary ↓
3. Timed reading	Reading a passage silently ↓
4. Comprehension	Comprehension check ↓
5. Homework	Vocabulary Practice ↓
6. Oral reading	Oral reading practice in class with model reading By individual/ paired reading/ choral reading ↓
7. Written test	Review quiz (vocabulary and comprehension) ↓
8. Oral reading test	Oral reading testing (week 13)

Firstly, the participants were given an opportunity to have rough ideas about the theme covered in each passage doing pre-reading activities. Following the pre-reading activities, the teacher introduced the target vocabulary covered in each unit. Then each student read the passage

silently with a stopwatch and measured their own silent reading rate. While they read the passage silently, they were asked to answer comprehension questions shown in the textbook. After that, the answers for comprehension questions were checked. For homework, "vocabulary practice" in the textbook and oral reading practice was assigned.

Having finished the above activities in the first week, students were asked to practice oral reading in class in the following week. Students logged into the subject site, which was provided by Shinshu University e-learning center and accessed the audio file of the passage(s) that they had learned the previous week. Each student was provided with a headset and practiced oral reading at his or her own pace. For this practice, 15 to 20 minutes were spent out of a 90-minute lesson. In-class oral reading practice gave students an opportunity to practice oral reading independently in class with the audio file of model reading which can demonstrate how to read the passage accurately and fluently with the appropriate speed.

The engineering class was unable to access the online audio file in class, so the teacher played a CD of model reading of the passages. Due to the limitation of the classroom environment, oral reading practice in the engineering class was often done by the class as a whole. Sometimes students practiced paired reading to check a partner's reading accuracy, rate and fluency.

6   Oral Reading Performance Assessment

6.1 Assessment Criteria

Students' oral reading performance was assessed based on the following three criteria: (1) rate, (2) accuracy and (3) fluency. Daane et al. (2005) suggest that measuring oral reading performance based on three aspects - rate, accuracy, and fluency –gives a significant indicator of overall reading performance since these three aspects forms a cluster of essential literacy proficiencies and functions. The following rubric (Table 2) was used to assess each student's oral reading performance.

Table 2: Oral reading performance assessment rubric

Rate (wpm)	5 130 or more	4 105–129	3 80–104	2 Less than 80
	*Your Rate (Total words read ÷ Total Minutes)×60 seconds=wpm (　　　　　÷　　　　　)×60 seconds=wpm			
Accuracy	5 (100–98%)	4 (97–95%)	3 (94–90%)	2 (less than 90%)
	*Your Accuracy Total Words–Errors=(　　　　)÷Total Words×100= (　　)% _____ -_____ =(　　　　)÷_____×100 = (　　)%			
Fluency	5 Fluent, phrased reading	4 Mixed word-by-word and phrased reading	3 Mostly word-by-word reading	2 All word-by-word reading
Your score (1+2+3)/3	5--------------------------4--------------------------3--------------------------2 fluent　　　　　proficient　　　　　moderate　　　　　poor Comments			

6.2 Assessment and Data Collection

In week 13, the oral reading testing of 120 students was conducted in each class. For the testing, each student was asked to read aloud one passage out of the given nine passages in front of the teacher. Students only could see which passage they were going to read right before the beginning of their testing. While students were tested, the teacher measured the time students read aloud a whole passage and counted reading errors. The teacher also assessed each student's reading fluency. According to Daane et al. (2005), fluency refers to the following three key elements. Firstly, the obvious grouping of words, or phrasing should be orally produced by readers. Secondly, readers should be able to read aloud recognizing the author's syntax. Thirdly, expressiveness is required in the oral reading presentation. Although this research was done by adapting the definition of fluency described by Daane et al. (2005), the definition of "expressiveness" was differently interpreted. "Expressiveness" in this research refers to "smooth and distinctive pronunciation, clear intonation, and appropriate pausing duration demonstrated by readers"

7　Results

7.1 Oral reading rate

Approximately 70% of students were able to read more than 105 words per minute. The average reading rate of all the students was 115 words per minute. The slowest reader read 67 words per minute while the fastest reader read 170 words per minute. The average reading rate by class and sex are shown below.

Table 3: Reading Rate

Rate Scale	130 or more per minute	105–129 words per minute	80–104 words per minute	Less than 80 words per minute	Total
Number of students	30	53	30	7	120
% of students	25%	44.2%	25%	5.8%	100%

Table 4: Average oral reading rate by class

Class	Agriculture	Engineering	Economics	Health Science	Average
Number of students	**33**	**28**	**30**	**29**	**-**
Average (words per minute)	115	102	120	121	115

Table 5: Average reading rate by sex

Sex	Male	Female	Total Average
Number of students	**61**	**59**	**120**
Average (words per minute)	111	118	115

7.2 Oral Reading Accuracy

More than 45% of students were able to read the passage with more than 95% accuracy. The average reading accuracy of all the participants was 94%. The average number of errors made per minute was 6 words. The lowest reading accuracy was 81% (or 13 errors made per minute) while the highest reading accuracy was 100% (or no errors made per minute). The average reading accuracy by class and sex are shown below.

Table 6: Number and % students for each range

Accuracy	(100–98%)	(97–95%)	(94–90%)	(less than 90%)	Total
Number of students	19	35	51	15	120
% of students	15.8%	29.2%	42.5%	12.5%	100%

Table 7: Average oral reading accuracy by class

Class	Agriculture	Engineering	Economics	Health Science	Average
No. of students	33	28	30	29	-
Accuracy	93 %	92%	95%	97%	94%

Table 8: Average reading accuracy by sex

Sex	Male	Female	Total Average
No. of students	61	59	120
Accuracy	93.5%	94.5%	94%

7.3 Oral Reading Fluency

Seventy percent of students were able to read fluently or occasionally read word by word. The average reading fluency score was 3.8 points. The lowest reading fluency score was 2.0 points while the highest reading fluency score was 5.0 points. The average reading fluency score by class and sex are shown below.

Table 9: Reading fluency score

Fluency	Fluent, phrased reading	Mixed word-by-word and phrased reading	Mostly word-by-word reading	All word-by-word reading	Total
Score scale	5 points	4 points	3 points	2 points	-

Number of students	22	62	33	3	120
% of students	18.3%	51.7%	27.5%	2.5%	100%

Table 10: Average fluency score by class

Class	Agriculture	Engineering	Economics	Health Science	Average
Average fluency score	3.63	3.6	3.9	4.1	3.8

Table 11: Average reading fluency score by sex

Sex	Male	Female	Average
No. of students	61	59	-
Accuracy	3.74	3.84	3.8

8 Major Findings from Oral Reading Performance Testing

8.1 Rate

There were three major causes which triggered a lower reading rate. Firstly, participants with a lower reading rate were either slow readers or slow speakers in their first language or combination of both. Secondly, those who made more mistakes tended to read the same words or phrases repeatedly. Thirdly, students who read too slow or too fast tended to make frequent errors.

Among the four classes, the engineering class showed the lowest average rate. It was most likely due to that their lessons not being organized in the computing room, so students were not able to access to the audio files from the computer.

The average reading rate of Japanese freshmen was lower than of overseas freshmen. The sample size of the overseas students was too small, so the result given from the testing was thought to be insignificant. However, it is worth mentioning that the Vietnamese alphabet is based on the Latin alphabet, so it is likely that the reading rate of the two Vietnamese students were both higher (134 and 149 words per minute respectively) than of all the participants because their familiarity with the Latin alphabet.

8.2 Accuracy

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Hudson et al. (2005) state reading accuracy is the ability that a reader can decode and recognize words correctly. Students who have difficulties recognizing and pronouncing words correctly often face problems such as making errors in various ways. The study revealed several error types made by participants. They are shown in Table 12:

Table 12: Typical types of errors made by participants in oral reading testing

Error types	Examples of frequent occurred errors
word substitution	· Substitution of particles (e.g., "*a*" for "*the*") · substituting "*challenges*" for "*challengers*"
word or sound insertion	· speaking some mumbling sounds such as "*Ah*" or "*Eh*" · inserting "a" or "the" · inserting "-s" or "-z" at the end of some nouns or verbs
mispronunciation	· numbers (e.g., *30,500 km*, *80*) · words with many syllables (e.g., *intelligent*, *peculiarity*, *electricity*, *particularly*, *comfortable*) · names (e.g., *Assane*, *Shameema*, *Godessa*, *Seth*, *Manolo*) · cities and countries; (e.g., *Ushuaia*, *Argentina*, *Guatemala*, *Hyderabad*, *Dubai*, *Senegal*, *Czech Republic*) · words that have two or more different pronunciations (e.g., lives - plural form of "life" or third person singular simple present indicative form of "live")
word or sound deletion	· deleting "a" or "the" · deleting "-s" or "-z" at the end of some nouns or verbs
inappropriate eye fixation	· skipping a word or a line

8.3 Fluency

As students read more words per minute with less errors made, their fluency score was correspondingly higher. In the other words, it can be said that reading rate and accuracy themselves are the two key elements to decide readers' fluency, and these two variables are strongly related to decide fluency in oral reading performance.

Table 13: Average reading fluency score, rate and accuracy by class

Class	Agriculture	Engineering	Economics	Health Science	Average
Average fluency score	3.63	3.6	3.9	4.1	3.8
Rate	115	102	120	121	115
Accuracy	93 %	92%	95%	97%	94%

Unlike measuring rate and accuracy from students' oral reading performance, fluency measurement raised some issues. First, performing fluency involves multiple skills such as expression and volume, phrasing, smoothness, and pace (Rasinski 2004) and it is difficult for the assessor to make reliable and precise rating. While students read the assigned passage, the assessor was required to pay attention to students' reading rate, accuracy and fluency and such a holistic approach to evaluating student' oral reading performance at one time might have led the teacher to evaluate readers' performance unreliably and inaccurately. While evaluation of oral reading rate and accuracy is based on quantitative information of the readers' performance such as the number of words read per minute and errors made, evaluation of oral reading fluency requires qualitative information and judgment based on readers' oral fluency performance which is challenging to translate into quantitative information. Therefore, it is suggested to assess readers' oral fluency separately from oral reading rate and accuracy. Data collected from separate assessment of oral reading rate and accuracy and oral reading fluency could be analyzed collectively to have a better understanding and feedback of readers' oral reading performance. Using a multidimensional rubric is convenient and time saving. However, teachers should design and employ assessment tools which can give accurate information for each component of oral reading performance assessment criteria

9   Correlations between Oral Reading Performance and Reading Comprehension

The results and major findings given from oral reading testing provided was used to find the correlation between freshmen's oral reading performance and comprehension.

In week 15, the written exam of reading comprehension was conducted and students were assessed with their reading comprehension. The purpose of the exam was to evaluate students' silent reading skills such as timed reading, reading comprehension, and vocabulary. Students

were asked to read three passages that students read for the first time at the exam. The passages were chosen based on passage topics, length, and vocabulary used. There were 90 questions in total and the score for each question was given equally.

9.1 Correlation between Oral Reading Rate and Reading Comprehension

The results from the written exam were analyzed together with the oral reading rate. There was some correlation shown from the analysis of oral reading rate and comprehension (see Table 14). Firstly, those who read faster in their oral reading tended to score better in their written exam, too. This indicates that the faster their oral reading is, the better their reading comprehension is. On the other hand, slower readers in oral reading more likely underscored in the written exam compared with faster readers. This means that improper decoding, word recognition and articulation contributed to poor comprehension of the given passages. Secondly, there were some marginal data that did not fit into the former analysis. Some students with slow oral reading rate could perform better at their written exam. It is assumed that many Japanese university students are familiar with reading silently for comprehension, and this past experience enabled students with lower oral reading rate to score better in the written exam. Thirdly, students with an oral reading rate which fell into 106 to 120 per minute displayed the well balanced oral reading skills and reading comprehension. The correlation between reading rate and comprehension was 0.4315.

Table 14: Correlation between oral reading rate and comprehension
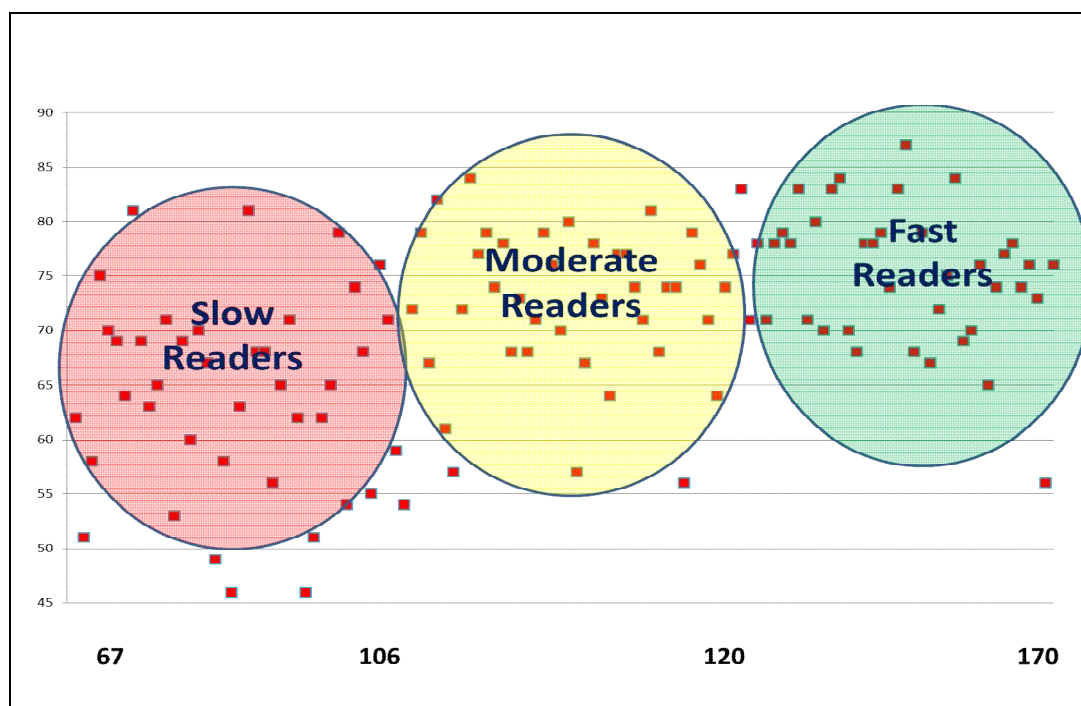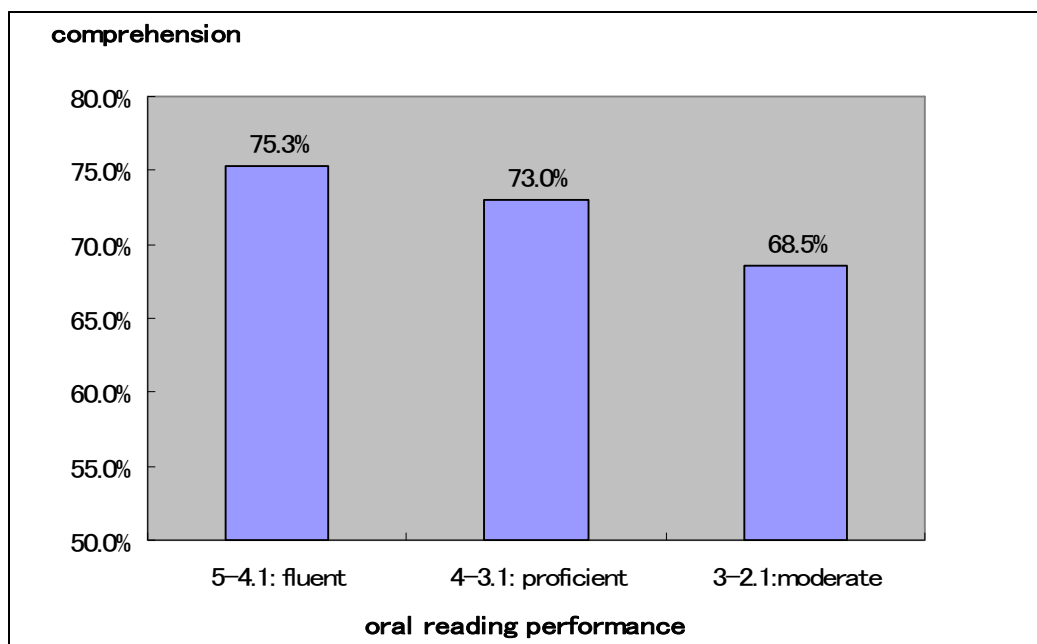
9.2 Correlation between Oral Reading Performance and Comprehension

The final results from oral reading performance testing were compared with the results from the written exam. Firstly, the number of students who fell into each level of oral reading performance (5-4.1= fluent, 4-3.1= proficient, 3-2.1=moderate, 2=poor) was calculated (see Table 15) and the average comprehension of each level was calculated. Then the data given from both tests were compared (Table 16).

Table 15: Oral reading performance results

Fluency score	5-4.1 Fluent	4-3.1 Proficient	3-2.1 Moderate	2 Poor
Number of students	34	62	23	1

Table 16: Comparison between oral reading performance and comprehension

The data show that the more fluently students read for their oral testing, the better their comprehension was (see Table 16). The correlation between oral reading performance and comprehension was 0.3008

Conclusion

This study examined Shinshu University freshmen's oral reading performance and its correlation with reading comprehension. Historically, many researchers have studied the correlation between oral reading rate, accuracy and fluency, but not many studies were conducted exploring correlations between oral reading and comprehension of adolescences and adult language learners. This study has shown that oral reading helps university students improve their reading skills. Integrating different reading skills to develop readers' reading ability is the important factor for language teachers. Good materials, learning environments, and planning for lessons is crucial to successfully organize the lessons, and must be chosen carefully to meet lesson objectives.

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