Is The Oral Reading Hypothesis Valid?

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This paper empirically examines the validity of the oral reading hypothesis (Miyasako, 2007): oral reading practice improves reading comprehension of Japanese learners of English. Following the review of our oral reading model, four assumed functions of oral reading practice and the hypothesis, two studies are reported that mainly investigated into the effect of oral reading practice on reading comprehension of Japanese senior high school students. The first within-group study shows that students with lower reading proficiency would improve their reading comprehension through oral reading practice. The second between-groups study shows that English instruction focused on oral reading would be more effective in the improvement than regular English instruction, supporting the first finding. Based on the discussion of the findings it is revealed that the hypothesis was partially supported. Also revealed is future research that should be conducted with a view to fully examining the validity of the hypothesis.

1. Introduction

In our theoretical and empirical approach to oral reading studies, we proposed the oral reading hypothesis (Miyasako, 2007), in addition to the componential processing model of oral reading (Miyasako, 2005a & 2006) and four assumed functions of oral reading practice (Miyasako, 2005a). The hypothesis states that oral reading practice improves reading comprehension of Japanese learners of English.

So far, the oral reading model and functions have received little criticism, which may be interpreted as showing that they have laid a theoretical foundation for oral reading studies. This makes a contrast with the hypothesis that has received not a few comments, both pros and cons. The cons are leveled mainly at: (a) the necessity of the hypothesis; and (b) the lack of empirical validation for it.

The first criticism is based on the recognition that it has been experientially known, as a rule of thumb, that oral reading plays important roles both in English acquisition and the development of reading proficiency. Although we welcome the appreciation of oral reading value, has this recognition been widely shared by ELT researchers and practitioners? Why had oral reading diminished its place in ELT under the influence of communicative language teaching before it recently revived several years ago? Had the rule of thumb not been almost thrown away by the tenets of communicative language teaching, i.e., communicative, task and meaningfulness principles (Richards & Rodgers, 2001)? One main reason for this lies in that the experiential knowledge has
not been theoretically and empirically grounded enough. Thus, the postulation of the oral reading hypothesis should be justified as a milestone to the empiricalization of oral reading studies.

Consequently, the second criticism is a legitimate one. It is admitted that the fledgling hypothesis has hardly been empirically examined but we have begun to seek the examinations, in addition to the following exceptional studies. Yasuki (2001) conducted a 9-month quasi-experiment with senior high school students to examine the effect of phrase oral reading, where learners read a text aloud in phrases, on their reading comprehension. The result showed that the oral reading group improved their reading comprehension significantly more than the control group. The other two studies indirectly supported the hypothesis by reporting favorable effects of oral reading practice on English language ability, a main constituent of which is reading comprehension. Suzuki (1998) disclosed in a two-year study that senior high school students with parallel oral reading, where they read a text aloud simultaneously with the model reading, improved their English language ability significantly more than the control students. Miyasako (2005b) revealed in a 3-month study, with senior high students who performed oral reading practice, that lower English language ability learners improved their English language ability significantly more than higher learners.

Evidently, we need to expand the empirical investigations. In this paper, we report two experiments, though pilot in nature, which mainly examined the effect of oral reading practice on reading comprehension of Japanese senior high school students. First, we briefly review the componential processing oral reading model, four assumed functions of oral reading practice and oral reading hypothesis. Then, following the reports of the two studies, we discuss the validity of the oral reading hypothesis.

2. Theoretical Backgrounds
2.1. Oral Reading Model

The componential processing oral reading model (Miyasako, 2006), focused on the reading processing in working memory, made an improvement on Goodman’s (1968) and Ito’s (1976) models in the elaboration of the reading processing. This model has three main characteristics. First, its reading processing complies with the componential processing view of reading (Grabe, 1999 & 2000; Grabe & Stoller, 2002), explaining many oral reading issues that have been anecdotally treated. Second, its word recognition component complies with the dual-route cascaded (DRC) model (Coltheart & Rastle, 1994; Ziegler, et al., 2000), with one route specializing for phonological coding of written information through grapheme-phoneme conversion, which is essential for decoding of incompetent English readers. Third, its processings are performed in the slave-systems of working memory, i.e., phonological loop and episodic buffer (Baddeley, 2000). The adoption of Baddeley’s multi-componential model, among others, can be justified because it is in the phonological loop that unfamiliar words are coded phonologically, complying with the DRC.
Visual Input

Working Memory

Long-term Memory

Word Recognition

Phonological Loop

Subvocal Rehearsal

Phonological Short-term Store

Central Executive

Episodic Buffer

Phonological Output Processor

Speech

Note: Arrows in solid lines represent the processings of competent readers. Arrows in dotted lines represent the processings that can take place in poor readers and in difficult discourses.

Figure 1. The Componential Processing Oral Reading Model (Miyasako, 2006)

model. The phonological coding is so vital for underdeveloped learners of English that the slave-system for this processing should constitute the oral reading model for Japanese EFL learners. Thus, these characteristics show that this oral reading model has a legitimate theoretical ground.

Figure 1 displays how inputted information is processed in the oral reading model. In the left the flow of the componential and phonological output processings is shown. In the center lie the processing space and phonological output processor and in the right long-term memory. Arrows in solid and dotted lines respectively represent the processings of competent oral readers and those of poor oral readers or in difficult discourses.

A general picture of oral reading process is illustrated as: (a) visual information is processed in the lower level components, i.e., word recognition, parsing and proposition formation, mainly in the phonological loop; (b) in the middle of stage (a), parallely, decoded, parsed or proposition-formed information begins to be processed in the phonological output processor in words and chunks, depending on the reader’s English proficiency and working memory resources left, and orally
produced; (c) if the resources are still available, in the higher level, the propositions are comprehended as the text and situation models consciously in the episodic buffer; and (d) the quality of oral production is likely to reflect the final componential processing completed. For more details see Miyasako (2004 & 2006).

2.2. Assumptions

Complying with the oral reading model, four assumptions were made about functions of oral reading practice: (a) oral reading practice helps learners to establish the connection between letters and sounds; (b) it helps them to expand vocabulary; (c) it helps them to acquire grammar through consciousness raising; and (d) it helps them to improve the efficiency of working memory (Miyasako, 2005a & 2005b; Miyasako & Takatsuka, 2004). The assumptions were limited to those which had theoretical and partially empirical grounds, adhering to the oral reading model.

Main grounds for the first assumption are: (a) oral reading practice can improve L1 learner word recognition skills, including the connection between letters and sounds (National Institute of Child Health and Human Development, 2000a & 2000b); and (b) the development of word recognition skills contributes to the improvement of reading comprehension (Carver, 1998; Castle, 1999; Grabe, 1999 & 2000; Grabe & Stroller, 2002; Snow, et al., 1998; Stanovich, 2000).

The second assumption is supported mainly by: (a) oral reading practice allows learners to expose to unfamiliar vocabulary more frequently than necessary, 5 to 16 times, for the acquisition (Nation, 1990); and (b) oral reading practice promotes the automatization of word retrieval (Anderson, et al., 2004), sparing working memory resources for higher level processing.

The primary support for the third assumption comes from grammatical consciousness raising. Oral reading practice can be a spontaneous grammatical consciousness raising activity for Japanese learners of English, who are highly conscious of grammar because of the way they are taught grammar, i.e., explicit grammar teaching based on the grammar translation method. They may be able to notice some grammatical gaps in their interlanguages when practicing oral reading of comprehensible passages and restructure them, as SLA research shows (Doughty, 2001; Ellis, 1997; Hinkel & Fotos, 2002; Larsen-Freeman, 2003; Richards, 2002; Schmidt, 2001; Skehan, 1998).

Reasons for the fourth assumption are: (a) oral reading practice improves L1 learner efficiency of phonological loop, in terms of decoding efficiency (National Institute of Child Health and Human Development, 2000a & 2000b); (b) oral reading practice should improve the efficiency of phonological loop as much as shadowing practice, which shares the processing of inputted information except for the initial mode difference, visual or aural (Miyasako, 2001 & 2005a); and (c) oral reading practice, which is a cognitively demanding and complex activity, may be able to improve the efficiencies of the central executive and episodic buffer because cognitively more demanding tasks are likely to activate the executive and buffer more (Osaka, et al., 1999; Osaka, 2002).
2.3. Oral Reading Hypothesis

The oral reading hypothesis was addressed as: oral reading practice improves reading comprehension of Japanese learners of English. It is based on study findings that show significant correlations between oral reading abilities, i.e., oral reading ability, oral reading fluency and oral reading speed, and reading comprehension for Japanese senior high school students (Miyasako, 2002; Miyasako & Takatsuka, 2005). Since oral reading practice naturally affects oral reading abilities more directly than reading comprehension, in seeking to improve reading comprehension through oral reading practice, the correlations can feasibly take shape in the development of the abilities as follows: (a) as oral reading abilities develop, reading comprehension develops; or (b) oral reading abilities and reading comprehension develop interactively. Hence, it is plausible that oral reading practice improves oral reading abilities and helps to improve reading comprehension.

Oral reading practice performs unique functions that sustained silent reading, which many would consider a better means of developing reading comprehension, does not in the development of reading comprehension. First, the decoding function, i.e., the assumed function (a) of oral reading practice performed in the word recognition component of the oral reading model, is what oral reading practice achieves quite effectively but silent reading does not. It is acknowledged that oral reading practice is superior to sustained silent reading in the improvement of L1 word recognition through developing phonemic awareness (National Institute of Child Health and Human Development, 2000a & 2000b). This decoding function supposedly applies to many Japanese learners of English who have unsophisticated decoding skills.

Second, the vocabulary-expanding function, which is assumed function (b) served in the word recognition component, is performed differently between oral and silent reading. Silent reading allows incidental learning of unknown words to take place through a broader exposure to vocabulary, which is inefficient with less than 10% acquisition rate of exposed unknown words (Horst, et al., 1998; Pigada & Schmitt, 2006). By contrast, oral reading allows learners to acquire unfamiliar items more rigidly and to make word retrieval more automatic through a narrower but more frequent exposure to lexical items.

Third, concerning the grammar-acquiring function, which is assumed function (c) in the parsing component, oral and silent reading share the mechanism, i.e., grammatical consciousness raising. However, oral reading enjoys phonological markers, representing functions and structures, which silent reading does not. Supersegmental clues, such as intonation, pauses and emphasis, help learners raise awareness of structures more easily.

Fourth, concerning the function of working memory, oral and silent reading are both cognitively demanding, enhancing the activation of working memory. However, oral reading helps to develop the efficiency of reading processing, involving working memory, much more than silent reading. In the first stage of the development, an elementary learner of English is likely to use up the working memory resources before the word recognition processing is completed. However,
oral reading practice helps her to become able to complete the processing and then to perform it with some resources left for the next processing, i.e., parsing. In the second stage, when her word recognition processing is more efficient and faster through oral reading practice, she may be able to perform the parsing processing before the resources are used up. In the third stage, the parsing processing may be faster through oral reading practice, facilitating the procedurisation of partially acquired rules, which makes the resources left for the following processing, i.e., proposition formation. Although the development of her reading comprehension may continue until she can complete the final processing, i.e., comprehension, within the working memory capacity, it is clear that oral reading practice is highly involved in the first two stages.

With these unique functions that oral reading performs, it is feasible to regard the relationship between oral reading abilities and reading comprehension as causal, i.e., the former causes the latter, at least in the development of word recognition skills. Since more than half of Japanese learners of English supposedly have not developed recognition skills fully, it is justified that the oral reading hypothesis was postulated.

3. Study 1
3.1. Purposes

The purposes of this study were to investigate into: (a) the effect of oral reading practice on reading comprehension of Japanese senior high school students; (b) more effective oral reading practice in the improvement of their reading comprehension; and (c) who would benefit more from oral reading practice. However, since oral reading practice constituted just about a third of English instruction in this study, it was decided to examine the effects of English instruction of which oral reading practice constituted about a third. This instruction was named ‘English instruction focused on oral reading’. Research questions were addressed as: (1) would English instruction focused on oral reading improve reading comprehension of Japanese senior high school students?; (2) would three English instructions focused on oral reading be similarly effective in improving their reading comprehension?; and (3) what reading proficiency should students have in order to benefit from English instruction focused on oral reading?

3.2. Method

This experiment was conducted for six weeks in the school year 2004. The design for the first research question was pre- and post-test within-group and it was 3 (treatment) x 3 (reading proficiency) x 2 (period) for the second and third research questions.

3.2.1. Participants

The participants were three classes of second-year senior high school students (n = 111) in Okayama, whose English proficiencies were in the range of elementary to pre-intermediate levels.
In order to examine the second research question, the three classes of students were randomly assigned to groups with three different English instructions focused on oral reading, i.e., groups A, B and C. For the third research question, the participants were divided into three reading proficiency levels based on the reading scores of BACE (English Language Proficiency Assessment): 10th-grade (scores above 55), 9th-grade (scores between 40 and 55) and below-9th-grade (scores below 40) reading proficiency students.

3.2.2. Instruments

Reading comprehension of the participants was measured with BACE reading scores (100 points for 12 items in 20 minutes), which was arguably reliable and valid based on Item Response Theory. The second edition of BACE 2003 and the first edition of BACE 2004 were used in the pre- and post-tests respectively.

3.2.3. Treatment

Groups A, B and C received respectively three different English instructions that included 15- to 20-minute oral reading practice twice a week in regular classes. The oral reading material used was parts of the coursebook, *Power On English II* (Tokyo Shoseki, 2003), that the participants were studying and had already covered.

The instructional purpose, consistent with the assumed functions of oral reading practice, was to improve the participants' reading comprehension by helping them: (a) to develop decoding skills; (b) to raise awareness of phrasal and grammatical chunks; and (c) to utilize working memory resources, spared by improved word recognition, for comprehension.

Groups A, B and C received the same procedure except for stage (d). The procedure consisted of the following stages (a) to (e): (a) listening to the model reading of a passage on CD, marking pauses; (b) questions and answers about the content; (c) explanation of grammar and vocabulary; (d) oral reading practice; and (e) consolidating tasks such as cloze procedure and passage reconstruction from jumbles. Moreover, optional oral reading was recommended to be performed out of class for 15 to 20 minutes on a daily basis.

In stage (d) three groups performed the following different oral reading activities. Group A performed variously chorus reading, buzz reading, individual reading, paced reading, parallel reading, and Read and Look-up, plus weekly measurement of oral reading speed. Group B performed the same oral reading activities without the measurement of oral reading speed. Group C practiced only chorus reading repeating after the model and buzz reading.

3.3. Results and Discussion

Table 1 shows the means of reading comprehension, as measured by BACE reading scores, for all the participants. The participants improved the means of reading comprehension (pre = 43.378,
Table 1. Means of Reading Comprehension for All Participants

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td>Pre-test</td>
<td>111</td>
<td>43.378</td>
<td>13.329</td>
</tr>
<tr>
<td>Post-test</td>
<td>111</td>
<td>47.270</td>
<td>12.506</td>
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</tbody>
</table>

Table 2. Means of Reading Comprehension for 10th-Grade, 9th-Grade and Below-9th-Grade Reading Proficiency Students in Groups A, B and C

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Group A: 10th-grade</td>
<td>12</td>
<td>69.417</td>
</tr>
<tr>
<td>9th-grade</td>
<td>9</td>
<td>47.778</td>
</tr>
<tr>
<td>Below-9th-grade</td>
<td>14</td>
<td>32.786</td>
</tr>
<tr>
<td>Group B: 10th-grade</td>
<td>12</td>
<td>60.417</td>
</tr>
<tr>
<td>9th-grade</td>
<td>13</td>
<td>46.615</td>
</tr>
<tr>
<td>Below-9th-grade</td>
<td>14</td>
<td>30.643</td>
</tr>
<tr>
<td>Group C: 10th-grade</td>
<td>4</td>
<td>59.750</td>
</tr>
<tr>
<td>9th-grade</td>
<td>13</td>
<td>46.538</td>
</tr>
<tr>
<td>Below-9th-grade</td>
<td>20</td>
<td>29.850</td>
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</table>

post = 47.270). The one-way repeated-measures ANOVA showed a significant mean difference in reading comprehension between the pre- and post-tests [F (1, 110) = 7.730, p < .01]. Considering the participants received no other formal English instruction during the period, the first research question is answered affirmatively. It seems that English instruction focused on oral reading helps to improve reading comprehension of Japanese senior high school students.

Table 2 shows the means of reading comprehension for 10th-grade, 9th-grade and below-9th-grade reading proficiency students in groups A, B and C. Since the 3 (reading proficiency) x 3 (treatment) x 2 (period) repeated-measures ANOVA showed no significant interaction between reading proficiency and treatment [F (4, 102) = 1.988, ns], we decided to separately examine the effects of reading proficiency and treatment on the participants’ reading comprehension.

Table 3 shows the means of reading comprehension for groups A, B and C. Group C appears to have improved the means of reading comprehension more than the other groups (gains for groups A, B and C were 1.06, 3.23 and 7.27 respectively). However, although the 3 (treatment) x 2 (period) repeated-measures ANOVA showed a significant main effect for period [F (1, 108) = 7.654, p < .01], there was neither a significant main effect for treatment [F (2, 108) = 1.884, ns] nor a
Table 3. Means of Reading Comprehension for Groups A, B and C

<table>
<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>35</td>
<td>46.114</td>
<td>13.081</td>
</tr>
<tr>
<td>post</td>
<td>35</td>
<td>47.171</td>
<td>12.033</td>
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<tr>
<td>Group B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>39</td>
<td>45.128</td>
<td>13.265</td>
</tr>
<tr>
<td>post</td>
<td>39</td>
<td>48.359</td>
<td>11.345</td>
</tr>
<tr>
<td>Group C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>37</td>
<td>38.946</td>
<td>12.834</td>
</tr>
<tr>
<td>post</td>
<td>37</td>
<td>46.216</td>
<td>14.242</td>
</tr>
</tbody>
</table>

Table 4. Means of Reading Comprehension for 10th-Grade, 9th-Grade and Below-9th-Grade Reading Proficiency Students

<table>
<thead>
<tr>
<th>Reading proficiency</th>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th-grade</td>
<td>pre</td>
<td>28</td>
<td>60.321</td>
<td>5.285</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>28</td>
<td>53.643</td>
<td>11.357</td>
</tr>
<tr>
<td>9th-grade</td>
<td>pre</td>
<td>35</td>
<td>46.886</td>
<td>2.665</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>35</td>
<td>46.771</td>
<td>11.285</td>
</tr>
<tr>
<td>Below-9th-grade</td>
<td>pre</td>
<td>48</td>
<td>30.938</td>
<td>7.507</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>48</td>
<td>43.917</td>
<td>12.804</td>
</tr>
</tbody>
</table>

significant interaction between the variables \( F (2, 108) = 1.677, \text{ ns} \). This result answered the second research question affirmatively. It seems that three English instructions focused on oral reading help to similarly improve reading comprehension of Japanese senior high school students.

Table 4 shows the means of reading comprehension for the 10th-grade, 9th-grade and below-9th-grade reading proficiency students. The below-9th-grade reading proficiency students improved the mean scores of reading comprehension (pre = 30.938, post = 43.917), the 9th-grade reading proficiency students did not change in the scores (pre = 46.886, post = 46.771) and there was a decline in the scores of the 10th-grade reading proficiency students (pre = 60.321, post = 53.643). The 3 (reading proficiency) \( \times 2 \) (period) repeated-measures ANOVA showed that there was a significant main effect for reading proficiency \( F (2, 108) = 67.363, p < .01 \) and a near significant main effect for period \( F (1, 108) = 2.984, p = .087 \). There was also a significant interaction between the variables \( F (2, 108) = 25.403, p < .01 \).

Furthermore, an independent 2 (reading proficiency) \( \times 2 \) (period) repeated-measures ANOVA was conducted on reading comprehension of the below-9th-grade and 9th-grade reading proficiency students. The result was that the below-9th-grade reading proficiency students improved their reading comprehension significantly more than the 9th-grade and 10th-grade reading proficiency students [interaction effect: \( F (1, 74) = 22.187, p < .01 \)]. On the other hand, the independent two-way repeated-measures ANOVA on reading comprehension of the 10th-grade and 9th-grade
reading proficiency students showed that the 10th-grade reading proficiency students suffered a decline in reading comprehension significantly more than the 9th-grade and below-9th-grade reading proficiency students [interaction effect: F (1, 61) = 5.471, p < .05]. Therefore, the third research question is answered as: students should be below 9th-grade reading proficiency level in order to benefit from English instruction focused on oral reading.

So far the results have answered the research questions. At this point we discuss questions regarding how much oral reading practice was responsible for the improvement of reading comprehension. First, concerning the third research question, why were the instructions effective for students with below-9th-grade reading proficiency, not for students with higher reading proficiency? One main reason for this may lie in the decoding function of oral reading practice (see Section 2.3). Students with this reading proficiency usually have not fully developed word recognition skills, especially letter-sound connection. It is highly probable that they improved their decoding during the 6-week experiment, complying with a study finding that oral reading practice does not take a long practicing period to improve the skills (Miyasako, 2002; Watanabe, 1990). It is also probable that the development of word recognition skills contributed to the efficiency of higher processings, such as parsing, proposition formation and comprehension, by sparing the working memory resources.

By contrast, the instructions were not effective for the 10th-grade and 9th-grade reading proficiency students because they had already developed more decoding skills than the below-ninth-grade reading proficiency students. It is likely that many 10th-grade and some 9th-grade reading proficiency students with developed decoding skills could not gain much from the oral reading practices. It is even possible that these students wasted much time on mechanically performing oral reading practice, not paying attention to meanings and grammar. In future research oral reading activities should be modified so that they will put oral readers into meaningfully exercising the vocabulary-expanding and grammar-acquiring functions.

Second, concerning the first research question, despite the limited effectiveness of the instructions, why did the participants, as a whole, improve their reading comprehension? It seems that this phenomenon took place because of the ratios that students with three reading proficiency levels comprised: 25.2% (28 out of 111), 31.5% (35 out of 111) and 43.2% (48 out of 111) for the 10th-grade, 9th-grade and below-9th-grade reading proficiency students respectively. The higher ratio of the below-9th-grade reading proficiency students played a vital role in determining the significance in the improvement of reading comprehension for all the participants.

Third, concerning the second research question, why were the three instructions similar in the effectiveness of developing reading comprehension? One reason for this is that the oral reading activities, regardless of variations, exercised only the decoding function. Consequently, three oral reading practices were similar not only in the effectiveness of developing decoding skills but also in the ineffectiveness of developing higher processing skills. Another lies in that the distribution of
students with three reading proficiency levels was fairly balanced. Through groups A, B and C, the effectiveness of the instructions for the three levels were almost consistent (Table 2). It seems that the three oral reading practices mainly improved reading comprehension of below-9th-grade reading proficiency students in each group respectively. This confirms the above suggestion for innovating oral reading activities to develop higher level processing skills.

Based on the discussion, it can be deduced that oral reading practice, which helped mainly to develop decoding skills of students with lower reading proficiency, was largely responsible for improving reading comprehension of the whole participants. However, this conclusion should exercise caution because of the pre- and post-group within-group design for the first research question. It is necessary to confirm the effectiveness of oral reading practice for lower reading proficiency learners in studies with controls.

4. Study 2
4.1. Purposes
The purposes of this study were to examine the effects of oral reading practice on reading comprehension and its relevant variants, i.e., reading fluency and the efficiency of phonological coding, for Japanese senior high school student. In order to investigate into the effects, we compared English instruction focused on oral reading with regular English instruction. Accordingly, research questions for the investigations were addressed as: (1) would English instruction focused on oral reading be more effective in improving reading comprehension of Japanese senior high school students?; (2) would the instruction be more effective in improving their reading fluency?; and (3) would the instruction be more effective in improving their efficiencies of phonological coding?

4.2. Method
4.2.1. Participants
This 6-week experiment, pre- and post-test between-groups quasi-experimental in design, was conducted with two classes of the 2005 first-year senior high school students (n = 74) in Okayama. Their English proficiencies were in the range of elementary to pre-intermediate levels. The two classes of students were randomly assigned to experimental (n = 38) and control (n = 36) groups. The two groups were matched in reading comprehension as measured by BACE reading scores.

4.2.2. Instruments
Three variants of the experiment were measured with the following instruments. Reading comprehension was measured with the same measure as in Study 1, i.e., BACE reading scores (100 points for 12 items in 20 minutes). The 2004 second and 2005 first editions were used in the pre- and post-tests respectively.
Reading fluency was measured, in the pre- and post-tests, as reading rate and reading efficiency index. The reading rate was calculated as the number of words that each participant could read silently in one minute, i.e., wpm. The reading efficiency index was calculated by multiplying each participant’s reading rate by her rate of correct answers in four comprehension questions about the passage: \( \text{(wpm)} \times \frac{\text{correct answers} + 1}{4 + 1} \). The reason for adding 1 both to the numerator and denominator lay in our assumption that even participants with all the questions incorrect would have a little comprehension of the passages. The reading passages (Appendix A), different in the pre- and post-tests, were about 120- and 160-word long and at Flesch-Kincaid Grade Levels 4 to 5. The participants measured their silent reading time individually with stopwatches.

The efficiency of phonological coding was measured as the naming speed of English pseudowords. The participants read aloud 40 one-syllable pseudowords (Appendix B), individually measuring their naming time with stopwatches. The efficiency was calculated as the number of syllables named in two seconds. Although the same pseudowords were used in the pre- and post-tests, the layouts were randomly altered.

### 4.2.3. Treatment

The experimental and control groups received 50-minute treatments in regular classes three times a week for 6 weeks. Both the oral reading-focused and regular instructions were taught by the same instructor. The shared part of the instructions, 30 to 35 minutes, consisted of: (a) listening to the model reading of a passage on CD; (b) questions and answers about the content in Japanese; (c) explanation of grammar and vocabulary; and (d) translation of difficult sentences. The coursebook was *New Stream English I* (Zoshindo, 2005).

In the rest of the oral reading-focused instruction, 15 to 20 minutes, the students performed oral reading practice with passages taught in the shared teaching. Its aim was similar to Study 1: to improve the students’ reading fluency and comprehension by exercising the assumed oral reading functions (see Section 2.2). However, oral reading activities and procedures of the previous study were modified so that processings higher than decoding can be improved: (a) chorus reading after the instructor or the CD; (b) parallel reading with the CD; (c) Read and Look-up; and (d) buzz reading. The students were also assigned to perform oral reading practice out of class for 15 to 20 minutes daily.

In the regular instruction, on the other hand, the students performed listening tasks and tasks on vocabulary and grammar for 15 to 20 minutes. Its aim was approximately the same with the other instruction with rationales: (a) the information processing mechanisms are quite similar between listening and reading; and (b) vocabulary and grammar are vital components of reading comprehension. The assignment was to perform tasks on vocabulary and grammar for 15 to 20 minutes daily.
Table 5. Means of Reading Comprehension for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>pre-test</td>
<td>38</td>
<td>49.184</td>
<td>12.802</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>38</td>
<td>50.579</td>
<td>9.500</td>
</tr>
<tr>
<td>Control</td>
<td>pre-test</td>
<td>36</td>
<td>48.361</td>
<td>11.608</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>36</td>
<td>44.806</td>
<td>10.326</td>
</tr>
</tbody>
</table>

Table 6. Means of Reading Rates for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>pre-test</td>
<td>38</td>
<td>71.959</td>
<td>17.240</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>38</td>
<td>123.009</td>
<td>25.866</td>
</tr>
<tr>
<td>Control</td>
<td>pre-test</td>
<td>36</td>
<td>71.247</td>
<td>21.635</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>36</td>
<td>94.385</td>
<td>30.884</td>
</tr>
</tbody>
</table>

Spearman-Brown rs were .882 and .862 in the pre- and post-tests respectively.

4.3. Results and Discussion

Table 5 shows the means of reading comprehension, as measured by BACE reading scores, in the pre- and post-tests for the experimental and control groups. The experimental group had a slight gain in the means of reading comprehension (pre = 49.184, post = 50.579) but the control group had a decrease in the means (pre = 48.361, post = 44.806). The one-way factorial ANOVA showed a significant mean difference in reading comprehension in the post-test between the two groups [F (1, 72) = 6.274, p < .05]. Since the experimental and control groups were matched in reading comprehension in the pre-test [F (1, 72) = .084, ns], it seems that English instruction focused on oral reading was more effective than regular English instruction in the improvement of the participants’ reading comprehension, answering the first research question.

Table 6 shows the means of reading rates (wpm) in the pre- and post-tests for the experimental and control groups. The measurement for reading fluency, which was calculated as the means of two-time measurements of the participants’ reading rates, was reliable in terms of Spearman-Brown reliability coefficient (rs were .882 and .862 in the pre- and post-tests respectively).

The experimental group had a greater gain in the mean reading rates (pre = 71.959, post = 123.009) than the control group (pre = 71.247, post = 94.385). The one-way factorial ANOVA showed a significant mean difference in the reading rates in the post-test between the two groups [F (1, 72) = 21.509, p < .01], which were matched in the reading rates in the pre-test [F (1, 72) = .020, ns]. Thus, it seems that English instruction focused on oral reading was more effective than regular English instruction in the improvement of the participants’ reading rates.

Table 7 shows the means of reading efficiency indices in the pre- and post-tests for the experimental and control groups. Although the measurements were not fully reliable in terms of
Table 7. Means of Reading Efficiency Indices for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>pre-test</td>
<td>38</td>
<td>49.898</td>
<td>17.833</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>38</td>
<td>90.687</td>
<td>21.012</td>
</tr>
<tr>
<td>Control</td>
<td>pre-test</td>
<td>36</td>
<td>49.828</td>
<td>22.306</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>36</td>
<td>71.179</td>
<td>20.499</td>
</tr>
</tbody>
</table>

Spearman-Brown rs were .713 and .658 in the pre- and post-tests respectively.

Table 8. Means of Efficiency of Phonological Coding for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>pre-test</td>
<td>38</td>
<td>1.502</td>
<td>.250</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>38</td>
<td>2.250</td>
<td>.464</td>
</tr>
<tr>
<td>Control</td>
<td>pre-test</td>
<td>36</td>
<td>1.549</td>
<td>.439</td>
</tr>
<tr>
<td></td>
<td>post-test</td>
<td>36</td>
<td>1.816</td>
<td>.513</td>
</tr>
</tbody>
</table>

Spearman-Brown reliability coefficient (rs were .713 and .658 in the pre- and post-tests respectively), the reliabilities were not so low as to ruin the examination of the effects of the treatments on reading fluency.

The experimental group had a larger gain in the mean reading efficiency indices (pre = 49.898, post = 90.687) than the control group (pre = 49.828, post = 71.179). There was a significant mean difference in the reading efficiency indices in the post-test between the two groups [F (1, 72) = 16.318, p < .01], which were matched in the indices in the pre-test [F (1, 72) = .0002, ns]. Therefore, it seems that English instruction focused on oral reading was more effective than regular English instruction in the improvement of the participants’ reading efficiency indices. This result, coupled with that of the reading rate, answers the second research question affirmatively.

Table 8 shows the means of the efficiencies of phonological coding in the pre- and post-tests for the experimental and control groups. A single measurement was adopted here because naming pseudowords of English would not be affected by factors such as frequency, familiarity and meaning of words.

There was a larger increase in the mean efficiencies of phonological coding for the experimental group (pre = 1.502, post = 2.250) than for the control group (pre = 1.549, post = 1.816). The one-way factorial ANOVA showed a significant mean difference in the efficiencies of phonological coding in the post-test between the two groups [F (1, 72) = 14.596, p < .01], which were matched in the efficiencies in the pre-test [F (1, 72) = .334, ns]. Thus, it seems that English instruction focused on oral reading was more effective than regular English instruction in the improvement of the participants’ efficiencies of phonological coding. The third research question is answered affirmatively.

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Until this point the results gave the research questions affirmative answers, showing that English instruction focused on oral reading improved the participants' reading comprehension, reading fluency and the efficiencies of phonological coding significantly more than regular English instruction. Thus, it seems that oral reading-focused instruction is more effective than regular instruction in the improvement of the reading abilities for senior high school students. However, it is not straightforward to support the oral reading hypothesis with this finding because of problems centering around the first research question.

The first problem concerns a noticeable result of reading comprehension. Although the experimental group achieved a slight improvement in the ability, the control group deteriorated in it. Consequently, the latter contributed greatly to the significant difference in the improvement between the two groups. There are at least two reasons for this. One reason may be the ineffectiveness of the shared parts of oral reading-focused and regular instructions. In this case, since the procedure of the shared teaching is among the most commonly implemented ones in English I course, it seems vital that activities in the procedure should be replaced by more effective ones. With such activities, the experimental group would have achieved a greater improvement in reading comprehension.

The other may be the measure of reading comprehension. Although the measure BACE is an arguably reliable one devised based on Item Response Theory, it may not have sustained its reliability because of the small number of question items, 12. Also, the nature of question items may not have been appropriate for this experiment because many of the questions require testees to perform top-down reading skills, which the instructions did not directly seek to develop. The reliability and testing nature of the measure should be examined more thoroughly in future studies.

The second problem concerns the control group that performed, as the treatment, listening tasks and tasks on grammar and vocabulary in regular English teaching. This treatment may invite a criticism that the experimental group naturally improved reading comprehension more because oral reading practice worked on reading comprehension more directly than the tasks for the control group. However, the tasks were adopted with the aim similar to that of the experimental group: to improve the students' reading fluency and comprehension, and with rationales: (a) the information processing mechanisms are quite similar between listening and reading; and (b) vocabulary and grammar are vital components of reading comprehension.

Admittedly, the rationales may not be persuading enough, but the criticism would not be self-evident either. Otherwise, oral reading practice would have been given a more important role in regular English instruction. This has not occurred because the importance of oral reading practice has not been recognized nor revealed empirically. Thus, it is worth while having compared the effectiveness between oral reading-focused and regular instructions and having confirmed the effectiveness of the former. Nevertheless, it is imperative that the effectiveness of oral reading practice should be compared with those of sustained silent reading and others in future studies.
The third problem concerns the experimental period. The experiment was six weeks long, as was Study 1, which may invite another criticism that experiments should be conducted in longer periods for the purpose of examining the improvement of reading comprehension. A longer investigation would have been preferable, admittedly, but there were technical difficulties that hampered us conducting longer ones. For one thing, the study did not fit into the school schedule. The 6 weeks experiment, conducted in May and June with one week mid-term exams intermission, could be expanded no longer because of the following schedule such as the final exams and summer vacation. For another, long-term projects were precluded because they would have been contaminated by unpredictable factors as well as unfavorable intermissions such as summer and winter vacations and school events. It is required to explore a practical approach to making better use of future oral reading studies in the pedagogical contexts.

Finally, despite the above problems, it may be secure to conclude that the oral reading hypothesis barely withstanded the investigations, especially when oral reading practice robustly improved reading fluency and the efficiency of phonological coding, vital constituents of reading comprehension, for Japanese senior high school students. In order to confirm this finding and reinforce the oral reading hypothesis, it is vital that we should continue our endeavors in the empirical examinations of it in better designed studies.

5. Conclusion and Future Research

This paper reported two studies that empirically examined the oral reading hypothesis, which was in a fledgling stage of the validation process. The studies partially supported the hypothesis with findings: (a) daily performance of about 20-30 minutes oral reading practice for a 6-week period would improve reading comprehension of Japanese senior high school students with below-9th-grade reading proficiency; (b) oral reading practice would contribute to the improvement by mainly exercising its decoding function; and (c) English instruction focused on oral reading would be more effective than frequently conducted English instruction with tasks on listening, vocabulary and grammar in the development of their reading comprehension.

Since the findings simply show that the oral reading hypothesis was fractionally supported in experiments with particular conditions for the participants and oral reading practices, the hypothesis requires to be examined in future studies with other conditions so that it can be more generally endorsed. First, it should be explored how much oral reading practice is needed, i.e., how much it should be performed daily and how long the practicing period should be. Can daily oral reading practice be shorter than 20-30 minutes in order to serve the decoding function? Can the practicing period be shorter than 6 weeks for this purpose? How much more practice is needed for performing the other functions concerning vocabulary, grammar and working memory? How long should the practicing period be for these purposes between 6 weeks and 2 years, which improved English language ability of senior high school students (Suzuki, 1998)?
Second, it should be probed into what oral reading activities can develop higher level processing skills than decoding by performing the other oral reading functions. Probable candidates are Read and Look up, which might exercise the grammar-acquiring function through promoting learner noticing, and phrase reading, which showed the effectiveness in the improvement of reading comprehension (Yasuki, 2001). Another potential candidate is the adoption of oral interpretation activities with discoursal and rhetorical perspectives (Ohmi, 1984 & 1996), which might enable learners to develop top-down comprehension skills.

Third, it should be examined what learners can benefit from oral reading practice. Probably, the first finding applies to other Japanese learners with below-9th-grade reading proficiency. However, as mentioned above, it has hardly been disclosed whether higher reading proficiency learners could develop their reading comprehension with more oral reading practice or other oral reading activities. Thus, it is important to investigate into and specify what reading proficiency learners can profit from what oral reading activities and how much oral reading practice.

Fourth, it should be investigated into how effective oral reading practice is in the improvement of reading comprehension in comparison with other tasks and practices including sustained silent reading, a supposedly best developer of reading comprehension despite the dearth of its empirical support in Japan. Since the hypothesis was postulated based on unique roles that oral reading practice would play in the improvement, which sustained silent reading would not (see Section 2.3), it is inevitable to compare the effectiveness between the two. In this case, the comparison is conducted between English instruction focused on oral reading and English instruction with sustained silent reading, which has usually not been performed in regular classes in Japan.

In examining the oral reading hypothesis in studies that seek to clarify these conditions as well as others, it is preferable that the hypothesis will be reinforced. However, it is possible that the hypothesis is refused partially or totally, leading to its modification and rejection. Either way, we should go a long way to seek the validation of the hypothesis. It is certain that this validation process would contribute not only to the betterment of oral reading studies but to the improvement of English reading pedagogy in Japan.

References


Miyasako, N. (2002). Kokosei no ondoku to eigoryoku wa kankei ga aruka [Does oral reading ability have a relationship with English language ability for senior high school students?]. STEP Bulletin, 14, 14-25.


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Appendix A. A Sample Passage Used for Measuring Reading Fluency

Passage: How does a man go up a mountain without getting tired? The motto is: Go slow. Don't try to run up the mountain and be there before your friends. Take your time; breathe regularly, taking two steps while you breathe in and two more while you breathe out. Be careful to put the whole of your foot flat on the ground; you should feel the ground with it first, before you put your weight on it. Do not sit down every five minutes but miss a couple of steps now and then to look at the scenery. Only sit down when it's time for food or a refreshment. If you remember all this, you will go up a mountain easily. (120 words; Flesch-Kincaid Grade Level=4.3) [Based on Abe (1984)]

Comprehension Questions (T/F): (1) You should go slow when you go up a mountain. (2) You should run up the mountain before your friends. (3) Do not sit down every five minutes. (4) Sit down when you have food or a refreshment.

Appendix B: 40 Pseudowords Used for Measuring Efficiency of Phonological Coding

barg, dort, jeel, ged, mun, pеб, torn, peem, nart, lork, jup, gock, deet, cham, darp, gerp, jorl, lon, nam, lig, jick, gadde, chorg, tep, pann, mup, lod, joop, darch, charn, tudge, pin, neeb, lud, gell, goot, chool, dorge, mitch, pin  [Based on Gathercole, et al. (2001)]