

# BRIDGE BETWEEN PHONETIC EDUCATION AND LITERACY EDUCATION FOR YOUNG EFL LEARNERS

Mitsue Allen-Tamai

## 要 旨

文部科学省は外国語専門部会のまとめとして小学校高学年生に対する英語の必修化を提案した。その目的は国際コミュニケーション力の育成である。

本論文は児童英語教育における適切なリテラシー指導を探るため、音韻認識能力とリーディング能力の関連性を検証したものである。パイロット研究であるため、テストの信頼性、妥当性についても研究した。その結果音韻認識能力、リーディング能力ともに適度な信頼度をもつテストを作ることができた。また、第一言語研究でも明らかのように、第二言語においても音韻認識能力と読みの能力に関連性があることが判明した。

## 1. Introduction

After 20 years of experimenting, Japanese elementary schools are now able to teach English in a “period of integrated study” under the latest Course of Study. Depending on a school’s choice, this class period can be used to teach courses dealing with the environment, welfare and health, computers, and cross-cultural education, which includes English. But under this system English is still optional and there has been an increasing request that English should be introduced as a required and regular subject.

At the end of March, 2006, the Foreign Language Special Working Group submitted its report concerning with the promotion of English education in elementary schools to the Central Council for Education. According to its report, the implementation of regular English classes on once-a-week basis is recommended for the upper graders in order to eliminate the inequality of opportunities for English education in each district. Although the aim of this proposed class is still to foster communicative competence rather than to improve basic English skills, teachers as well as students and their parents are likely to

expect they should start English learning early so that they can communicate with others in English in the future.

In order to support the success of such a new attempt to introduce English education into public elementary schools, we need to develop effective English programs which will enable children to learn basic knowledge, skills, and strategies. Furthermore, we must provide for the continuity and applicability of these English programs in successive grades, through middle school and beyond. In regard to developing a consistent program which will benefit Japanese children in elementary school, it is very important to create an effective reading program. The present study suggests the importance of establishing pre-reading programs focused on the development of phonological awareness, which serves as a bridge between the spoken and written codes.

## **2. Literature Review**

In the past three decades, L1 researchers have substantially investigated the relationship between phonological awareness (sometimes called phoneme awareness or phonemic awareness) and literacy development. Phonological awareness has been defined in such terms as “one’s awareness of and access to the phonology of one’s language” (Wagner & Torgesen, 1987, p.192), or “the ability to recognize that a spoken word consists of a sequence of individual sounds” (Ball & Blachman, 1991, p.51).

As the literature in this field indicates, phonological awareness has been measured by a variety of tasks. Adams (1995) has defined five levels of difficulty among various phonemic tasks used in studies. The tasks are examining the abilities to; (a) remember familiar rhymes, (b) recognize and sort patterns of rhyme and alliteration in words, (c) blend and isolate phonemes in words, (d) segment the words completely, and (e) add, delete, or move phonemes and create real words or pseudo words (p.67-79).

Numerous correlational studies (e.g., Liberman, Shankweiler, Fischer, & Carter, 1974; Stanovich, Cunningham, & Cramer, 1984; Tunmer & Nesdale, 1985) have reported that there is a positive relationship between the awareness of sounds in spoken words and the early stage of literacy acquisition. Lundberg, Olofsson, and Wall (1980) reported that phonological awareness was a moderately strong predictor of the word recognition and reading development of their Danish participants. Another study (Bradley & Bryant, 1983) measuring phonological awareness of pre-readers also showed that awareness of spoken words related to eventual success in reading.

In order to substantiate the claim of a causal relation between phonological awareness and literacy development, a significant number of experimental studies have also been

conducted. Some studies have reported that young learners can be trained in manipulating phonemes (Torneus, 1984; Olofsson & Lundberg, 1985). Other studies (Lundberg, Frost, & Peterson 1988; Ball & Blachman 1991) have reported that sound training improved reading and word recognition acquisition. These results suggest that sound training is beneficial to developing phonological awareness, word recognition, and reading skills of young learners.

As the related literature has reported, phonological awareness plays an important role in developing reading ability and have supported the idea that phonological awareness influences subsequent reading development. The present study is a pilot study that has investigated the question of whether or not the same principle is applicable in the EFL context. This descriptive study aimed at investigating:

- (1) How reliable are the measurements?
- (2) How do English phonological awareness and English reading ability of Japanese EFL learners relate to each other?
- (3) What affects English reading ability?

### 3. Method

#### *Participants*

Thirty-nine elementary school-aged girls and twenty boys from three different English institutions in Tokyo participated in the study. The Children ranged in age from seven to eleven years, with an average of nine years and two months. All of them had learned English once a week, for 60 minutes, for longer than one year when this study was conducted.

#### *Instruments*

In order to examine phonological awareness and reading ability of the participants, five tests were designed for this experiment. Some examples of each test are listed in Appendix.

*CV-oddity Test* — This test consisted of 20 items of four multiple choices in which the participants were asked to select one word which did not accord with other words. For example, the participants were supposed to choose ‘king’ from the set of words ‘cat, cap, cash, king,’ since all other words shared the same initial consonant(s) and the middle vowel — the same CV-unit.

*Rhyme (-VC) Test* — This test was composed of 20 items of four multiple choices and the participants were asked to select the one word which did not have the same rime this time. For example, the participants were supposed to choose ‘road’ from the set of sold,

told, cold, road, since other words shared the same vowel and the final consonant(s).

*Reading Test I* — This test consisted of 20 items of three multiple choices. The participants were asked to choose an appropriate word to complete a sentence. For example, they were supposed to choose 'red' in the question of "The color of apples is (1 rat, 2 red, 3 read)." All the question words in items 1 to 10 shared the first two letters, and no pseudo words were used.

*Reading Test II* — Another kind of test using some pictures was designed to examine reading ability of the participants. This test consisted of 20 items of matching, with true/false questions. In items 1 to 10, the participants were asked to choose the appropriate picture which depicted each sentence. In the second half of the test, they had to write a circle if a sentence described the picture correctly, and write an x if it did not. There were two pictures, and five questions were asked for each picture.

*Word recognition Test* — Word recognition was assessed by 23 items of three multiple choices. Those words were selected, based on the results of the Vocabulary Test done with the same population two years ago. The question items were composed of one right spelled word and two pseudo words that were made for distraction.

#### *Procedures*

It took the first 30 to 40 minutes of two lessons to conduct these tests; the CV- oddity test, the word recognition test, and the reading test II in the first week, and the rhyme test and the reading I in the second week. The purpose and the procedure of the study were explained to the experimenters, who were the teachers of the participants.

## **4. Results and Discussion**

### *Item Analysis*

In order to examine whether or not the instruments used in this experiment were reliable, all items were analyzed on the basis of classical theory. Item facility (IF) is the percentage of the participants that correctly answers a given question and thus indicates the difficulty of each item for the actual participants. Point-biserial correlation coefficient ( $r_{pbi}$ ) are frequently used in test analysis to examine the relation between a single test item and the total test score. This coefficient examines the degree to which a given item separates the participants who performed well from those who performed poorly. Item discrimination (ID) is another statistical index used to examine how each item separates the examinees with high scores from those with low scores. Appropriate IF values are set in a range of between .30 and .75 and those of ID were set over .30 (Brown 1996, p.70). Point-biserial correlation coefficient with one asterisk indicates that the coefficient is

significant at the .05 levels and those with two asterisks are significant at the .001 level.

Table 1 presents item analysis of the CV- oddity test. It shows that the participants found item 11 the easiest and item 13 most difficult. Items 4, 8, 17, 19, 20 were found to be “functional” items, which had acceptable values of these three indices and this comprised 25% of the test.

**Table 1** Item Analysis for the CV- oddity Test (N=59)

Item	IF	ID	$r_{pbi}$	Item	IF	ID	$r_{pbi}$
A 01	.93	-.07	-.06	A 11	.95	.20	.48* *
A 02	<u>.75</u>	.13	.15	A 12	.90	.27	.62* *
A 03	<u>.66</u>	.20	.35*	A 13	.29	.27	.28*
A 04	<u>.63</u>	<u>.53</u>	.57* *	A 14	.83	.27	.37* *
A 05	<u>.48</u>	.20	.17	A 15	.88	<u>.33</u>	.60* *
A 06	.92	.27	.49* *	A 16	<u>.36</u>	.13	.10
A 07	.92	.20	.49* *	A 17	<u>.71</u>	<u>.47</u>	.50* *
A 08	.85	<u>.33</u>	.423* *	A 18	.78	.13	.20
A 09	<u>.70</u>	<u>.33</u>	.26	A 19	<u>.71</u>	<u>.47</u>	.48* *
A 10	.93	.20	.55* *	A 20	<u>.44</u>	<u>.40</u>	.27

Table 2 shows the results of item analysis of the rhyme test. The participants found item 7 the easiest and items 10 and 15 most difficult. Items 3, 5, 9, 10, 11, 16, 17, 18, 20 were found to be “functional” items, which comprised 45% of the test.

**Table 2** Item Analysis for the Rhyme Test (N=47)

Item	IF	ID	$r_{pbi}$	Item	IF	ID	$r_{pbi}$
B 01	<u>.62</u>	.27	.14	B 11	<u>.68</u>	<u>.53</u>	.56* *
B 02	<u>.62</u>	.20	.35*	B 12	.92	.20	.33*
B 03	<u>.57</u>	<u>.40</u>	.38* *	B 13	<u>.64</u>	.27	.31*
B 04	<u>.53</u>	.13	.21	B 14	.79	<u>.60</u>	.70* *
B 05	<u>.32</u>	<u>.33</u>	.30*	B 15	<u>.38</u>	.27	.23
B 06	.83	.27	.28	B 16	<u>.66</u>	<u>.67</u>	.55* *
B 07	.94	.13	.19	B 17	<u>.64</u>	<u>.40</u>	.32*
B 08	.85	<u>.40</u>	.53* *	B 18	<u>.62</u>	<u>.40</u>	.37*
B 09	<u>.53</u>	<u>.47</u>	.28	B 19	<u>.62</u>	.27	.14
B 10	.38	<u>.40</u>	.23	B 20	.55	.33	.13

Table 3 reports item analysis of Reading test I. It shows that the participants found item 8 the easiest and items 20 most difficult. Items 1,2,3,4,6,7,9,10,11,12,13,14,15,16,18 were found to be “functional” items, which comprised 75% of the test.

Table 4 shows that the participants found item 8 the easiest and item 20 most difficult. Items 1,2,3,4,6,7,9,10,11,12,16,17 were found to be “functional” items, which comprised 60% of the test.

Table 5 reports item analysis of the word recognition test. It showed that the participants found items 24, 25, 26, 3 and 22 to be easy and items 23 and 15 to be difficult. Items 2,4,6,7,8,10,11,12,13,14,16,18,19,21,27,28,30 were found to be “functional” items, which comprised 57% of the test.

#### *Reliability*

The reliability coefficients of the five tests are listed in Table 6. The CV- oddity test and the rhyme test were combined and used as an indicator of phonological awareness.

**Table 3** Item Analysis for the Reading Test I (N=51)

Item	IF	ID	$r_{pbi}$	Item	IF	ID	$r_{pbi}$
C 01	<u>.68</u>	<u>.33</u>	.43* *	C 11	<u>.66</u>	<u>.47</u>	.46* *
C 02	<u>.60</u>	<u>.53</u>	.55* *	C 12	<u>.48</u>	<u>.47</u>	.45* *
C 03	<u>.57</u>	<u>.67</u>	.57* *	C 13	<u>.56</u>	<u>.73</u>	.67* *
C 04	<u>.46</u>	<u>.53</u>	.50* *	C 14	<u>.50</u>	<u>.47</u>	.40* :
C 05	<u>.54</u>	.20	.26	C 15	<u>.42</u>	<u>.47</u>	.47* *
C 06	<u>.44</u>	<u>.47</u>	.59* *	C 16	<u>.50</u>	<u>.60</u>	.48* *
C 07	<u>.44</u>	<u>.33</u>	.40* *	C 17	<u>.60</u>	<u>.53</u>	.48* *
C 08	.76	<u>.40</u>	.49* *	C 18	<u>.56</u>	<u>.67</u>	.45* *
C 09	<u>.52</u>	<u>.40</u>	.43* *	C 19	<u>.46</u>	.27	.29
C 10	<u>.48</u>	<u>.40</u>	.50* *	C 20	<u>.38</u>	.13	.17

**Table 4** Item Analysis of Reading Test II (N=47)

Items	IF	ID	$r_{pbi}$	Items	IF	ID	$r_{pbi}$
D 01	<u>.47</u>	<u>.67</u>	.52* *	D 11	<u>.53</u>	<u>.53</u>	.36*
D 02	<u>.50</u>	<u>.73</u>	.45* *	D 12	<u>.55</u>	<u>.47</u>	.41* *
D 03	<u>.51</u>	<u>.60</u>	.62* *	D 13	<u>.64</u>	.13	.31*
D 04	<u>.51</u>	<u>.73</u>	.66* *	D 14	<u>.38</u>	.20	.40* *
D 05	<u>.66</u>	.27	.25	D 15	<u>.43</u>	0	.24
D 06	<u>.49</u>	<u>.80</u>	.57* *	D 16	<u>.53</u>	<u>.53</u>	.49* *
D 07	<u>.47</u>	<u>.33</u>	.44* *	D 17	<u>.60</u>	<u>.40</u>	.36*
D 08	<u>.68</u>	.27	.29	D 18	<u>.53</u>	.20	.21
D 09	<u>.49</u>	<u>.53</u>	.52* *	D 19	<u>.60</u>	.13	.33*
D 10	<u>.57</u>	<u>.60</u>	.46* *	D 20	<u>.51</u>	.27	.30*

**Table 5** Item Analysis for the Word recognition Test  
(N=59 for items 1 to 23, N=35 for items 24 to 30)

Items	IF	ID	$r_{pbi}$	Items	IF	ID	$r_{pbi}$
E 01	<u>.73</u>	.25	.31*	E 16	<u>.46</u>	<u>.35</u>	.33*
E 02	<u>.59</u>	<u>.30</u>	.34*	E 17	<u>.42</u>	.20	.19
E 03	.83	<u>.40</u>	.45**	E 18	<u>.39</u>	<u>.30</u>	.27
E 04	<u>.64</u>	<u>.60</u>	.50**	E 19	<u>.61</u>	<u>.65</u>	.49**
E 05	<u>.54</u>	.20	.17	E 20	<u>.39</u>	.10	.15
E 06	<u>.39</u>	<u>.40</u>	.30*	E 21	<u>.41</u>	<u>.40</u>	.37**
E 07	<u>.61</u>	<u>.45</u>	.43**	E 22	.85	<u>.40</u>	.46**
E 08	<u>.53</u>	<u>.55</u>	.44**	E 23	.29	<u>.30</u>	.34*
E 09	.80	<u>.40</u>	.48**	E 24	.86	<u>.33</u>	.59**
E 10	<u>.58</u>	<u>.50</u>	.34*	E 25	.86	<u>.33</u>	.57**
E 11	.71	<u>.65</u>	.61**	E 26	.86	<u>.33</u>	.18
E 12	<u>.49</u>	.35	.40**	E 27	<u>.69</u>	<u>.58</u>	.47**
E 13	<u>.64</u>	<u>.40</u>	.40**	E 28	<u>.69</u>	<u>.50</u>	.49**
E 14	<u>.36</u>	<u>.45</u>	.40**	E 29	<u>.54</u>	.25	.25
E 15	<u>.36</u>	.15	.11	E 30	.71	<u>.67</u>	.64**

**Table 6** Reliability of the five tests and two combined tests

Tests	N	K	Reliability (alpha)
CV- oddity	59	20	.75
Rhyme	47	20	.67
Reading I	49	20	.81
Reading II	46	20	.75
Word recognition	59	23	.69
Word recognition	35	30	.76
Sound	47	40	.79
Reading	44	40	.87

Reading test I and II were also combined for reading ability.

In order to increase the reliability of the word recognition test, seven additional question items were given to some participants. Since some participants were already in their spring vacation, only 35 children could participate in taking this part of the test. Each additional question item was composed of one correctly spelled word and two real words for distraction. Although pseudo words or nonsense words are frequently used to measure word knowledge of first language learners, from a pedagogical point of view the value of creating difficulties by using pseudo words seemed less suitable for young foreign language learners. The reliability for 30 items of the revised word recognition test was .76 with 35 subjects.

*What affects English reading ability of young EFL learners?*

The attribute variables of reading acquisition are examined in this section. The descriptive statistics of the five tests and two combined tests are reported in Table 7. Skewness of the CV-oddity test showed negative skewness. Kurtosis of the CV- oddity test also showed that the distribution curve was too ‘flat’. Thus, these two components of normality indicate that the distribution of CV-oddity test was questionable. However, the sound test-combined scores of CV-oddity test and rhyme test-shows that its distribution was in an acceptable range.

**Table 7** Descriptive Statistics of the Five Tests

Tests	<i>N</i>	Min.	Max.	<i>M</i>	<i>sd</i>	Skewness	Kurtosis
CV	59	4	20	14.59	3.33	-1.17	1.33
Rhyme	47	6	18	12.68	3.40	-.07	-.91
Read I	51	0	20	10.39	4.85	.37	-.66
Read II	47	3	20	10.66	4.14	.55	-.37
Word	59	4	22	12.59	3.93	.20	-.32
Sound	47	12	37	27.30	5.66	-.61	.35
Read	45	10	40	21.13	7.94	.80	-.23

CV=CV-oddity test, Word=Word Recognition test

Table 8 shows the correlation coefficients for all the three tests, age, the length of learning (LL, hereafter) and sex. The Reading Test was positively correlated to Age ( $r=.63$ ), Word recognition Test ( $r=.62$ ) and Sound Test ( $r=.53$ ), which means that the older children were better readers and those with better sound ability and more word recognition knowledge were more proficient readers. The Sound Test was also positively correlated to Age ( $r=.45$ ) and Word recognition Test ( $r=.33$ ), but negatively correlated to SEX ( $r=-.33$ ). The older children were found to be better at detecting CV-oddity and rhymes. Those with better phonological awareness had more knowledge about written words than those with less sound awareness. The male subjects showed better sound awareness than the female subjects. The Word recognition Test correlated to Age ( $r=.48$ ), LL ( $r=.18$ ) and LL corresponded with Age ( $r=.33$ ). The Age and the Sound Test shared more variance together than the other factors. The highest correlation coefficient in this study was found between Age and Reading Test ( $r=.63$ ) and showed 39.7% of overlapping variance.

A path analysis was conducted to estimate the effects among the variables and to find unique relations of variables to each other. The five variables in this analysis were Age,



the length of learning (LL), Sound (the combined scores of CV- oddity test and rhyme test), Word Recognition, and Read (those of reading test I & II, and word recognition test). The hypothesized model (Figure 1) was examined by EQS. The researcher tested how reading ability was directly and indirectly affected by other variables by setting Age and LL affecting variables in the first wave, and Sound and Word Recognition scores in the second wave.

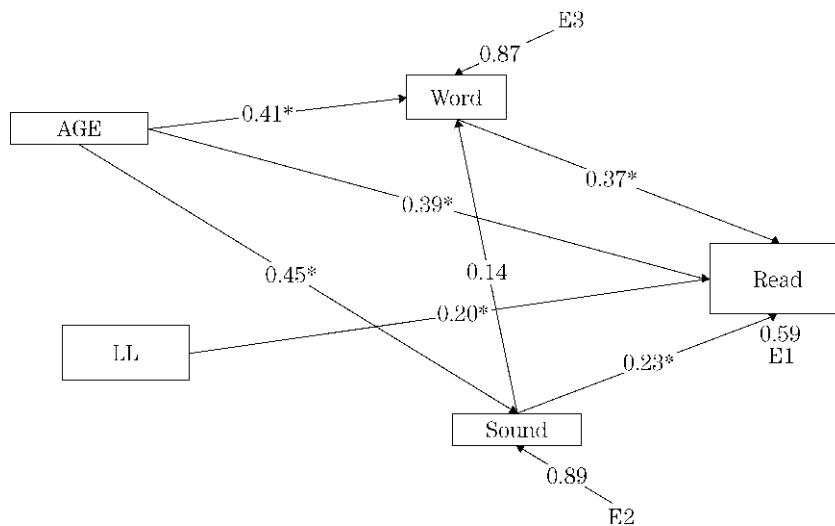
**Table 8** Correlation Matrix of Six Variables

	Read	Sound	Word	Sex	Age	LL
Read	1.00					
Sound	0.53**	1.00				
Word	0.62**	0.33*	1.00			
Sex	-0.29*	-0.33*	-0.26	1.00		
Age	0.63**	0.45**	0.48**	-0.28	1.00	
LL	0.02	0.13	0.18	0.05	0.33*	1.00

Note: \*\* Correlation is significant at the 0.01 level.

\* Correlation is significant at the 0.05 level.

**Figure 1** Path analysis of reading ability



The EQS output indicated that no special problems occurred in the estimation. This chi-square value was not statistically significant at  $p = .05$ . The hypothesized model was tested and support for it was found;  $\chi^2(3, N = 45) = 5.00$ ,  $p = .05$ , comparative fit index (CFI) = .97.

The hypothesis that phonological awareness affects both word acquisition ( $\beta=.14$ ) and reading acquisition ( $\beta=.23$ ) was found to be adequate. One concern with this model is that LL negatively affects reading acquisition ( $\beta= -.20$ ). There was a variety of English learning backgrounds among the participants in this experiment; some subjects received regular English classes at their private elementary schools and others had a prior experience of English lessons before they entered the classes of this experiment. Since each teacher reported only the length that each subject learned English in her class, their total exposure to English was not reflected here. In a future study, a precise questionnaire should be prepared to investigate more about educational background of the participants.

## 5. Conclusion

According to item analysis and reliability, the five tests used in this experiment seemed adequately reliable. There were high IF question items in the CV- oddity Test. The participants in this study also found that CV- oddity detection was easier than rhyme detection. The most difficult test — Reading test I — had the most functional items, which comprised 75% of the test items.

As figure 1 shows, phonological awareness of young Japanese EFL learners was found to relate significantly to their reading abilities. This means that the same principle found in L1 research was validated in EFL situation, although the directionality of these factors was not examined in this study.

Age was also found to be the strongest factor to predict successful literacy acquisition, since there were direct and indirect paths from Age to Reading.

The biggest limitation of this study was the failure to collect a large number of participants which is a requirement for structural equation modeling. This problem was due to the fact that this was the pilot study mainly designed to establish reliable measurements. In a future study, special attention should be paid to meet this design requirement.

This study, however, has an important pedagogical implication. As mentioned earlier, children at public elementary schools in Japan has been exposed to English since 2002. The Ministry of Education, Culture, Sports, Science and Technology has recommended not introducing literacy activities into English classes but fostering phonetic education, because it is deeply concerned about negative effects of introducing literacy on English-learning attitudes of the students. The author does not deny the importance of providing appropriate aural input to young learners and also recognizes its value. Yet she believes that it would be a shame if these lessons end up only enhancing listening, but not connecting to the development of literacy. In order to provide a good continuity between English programs

in elementary school and those in junior and high school, she stresses the necessity of researching further the relationship between phonological awareness and reading ability.

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## Appendix

### CV-oddity Test

- |   |     |     |      |      |
|---|-----|-----|------|------|
| 1 | cat | cap | cash | king |
| 2 | mat | map | mad  | men  |
| 3 | bug | bus | but  | bed  |

### 2. Rhyme Test

- |   |      |      |      |      |
|---|------|------|------|------|
| 1 | sold | told | cold | road |
| 2 | hot  | lot  | pot  | mat  |
| 3 | low  | toe  | sow  | cow  |

### 3. Reading Test I

1. The color of apples is (1 rest, 2 red, 3 read).
2. The color of lemons is (1 yellow, 2 year, 3 yeast).
3. The color of leaves is (1 grow, 2 grass, 3 green).

### 4. Reading Test II

- I Choose the appropriate picture for each sentence.
- 1 He's reading.
  - 2 She's coloring.
- II Look at the picture and write a circle if the sentence is right.  
Write an X if it is not.
- Two monkeys are on the tree.  
The monkeys are eating apples.

### Word recognition Test

- |   |      |      |      |
|---|------|------|------|
| 1 | bear | dear | pear |
| 2 | cow  | cew  | caw  |
| 3 | fish | pish | kish |