



## Effect of synthetic phonics instruction on literacy skills in an ESL setting



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### ABSTRACT

In the present study, the effectiveness of a synthetic phonics approach to teaching 10 year old Kannada-speaking children to read English was compared with a modified approach whereby the English letter sounds were also represented by the symbols used in Kannada, thus tapping into pre-existing graphophonological awareness skills. After 5-weeks of instruction, participants taught by the Kannada-mediated synthetic phonics approach performed significantly better on the reading, spelling, and graphophonological tasks than the group taught by synthetic phonics using only English letter–sound correspondences, who in turn performed better than the comparison group taught by the standard non-phonics classroom method. Applying the metalinguistic knowledge of the first language seems to have been beneficial in developing literacy skills in English.

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### 1. Introduction

According to the Language Interdependence Hypothesis (LIH), for those learning two languages, progress in one language can facilitate progress in a second language (Cummins, 1979, 1980; Durgunoğlu, 2002). Furthermore, Durgunoğlu, Nagy, and Hancin-Bhatt (1993) found that children who had high levels of phonological awareness in Spanish performed well on reading words and non-words in English, and Manis, Lindsey, and Bailey (2004) found that Spanish and English phonological awareness, print awareness, and rapid naming were related. Indeed, it has often been found that students who were proficient in their first language (L1) were better readers in English (L2), whether the first language had either an alphabetic or non-alphabetic writing system (Japanese: Koda, 1989; Yamashita, 2002; Arabic: Abu-Rabia & Siegel, 2002; Portuguese: DaFontoura & Siegel, 1995; Italian: D'Angiulli, Siegel, & Serra, 2001; Chinese: Jackson, Chen, Goldsberry-Shaver, Kim, & Vanderwerff, 1999).

In some syllabic writing systems, the phonemic element may be represented in the syllable, such as in Korean Hangeul and much of East-Asian orthography. However, there are other systems where the phonemic element is not represented in the syllable, such as in Japanese Kana. Logographic writing systems where a morpheme is the basic

element, such as Chinese Kanji, are described as morphosyllabic writing systems. Cheung, McBride-Chang, and Tong (2011), however, found that learning to read in English was only cross-linguistically facilitated by reading in non-alphabetic Chinese or Korean if it was taught in an alphabetic way, as this promotes phoneme-level phonological awareness. Furthermore, this facilitation may only occur when two languages are introduced about the same time. In this paper, we examine what happens when children who are already literate in a different writing system then learn to read in English. Specifically, we wanted to explore whether synthetic phonics instruction using the sound–symbol correspondence in Kannada (which uses an alpha-syllabic writing system) would facilitate the acquisition of literacy skills in English.

The Kannada writing system, used in the state of Karnataka in India, has 50 basic letter symbols, called *aksharas*; these consist of a mixture of syllabic and alphabetic principles (Karanth, 2006; Prakash & Joshi, 1995). The script for Kannada consists of vowels and consonant–vowel phonograms. The consonant–vowel phonograms are written by a consonant plus a vowel in the form of a diacritical mark, and represent syllables. The diacritical mark varies according to the vowel needed (the base vowel for a consonant *akshara* is /a/). The *aksharas* for single vowels are alphabetic, and are used when the vowel is in initial position, or when a morpheme is represented by a vowel. The present study capitalizes on the fact that syllabic Kannada *aksharas* can be used to represent the sounds of English consonants by stripping off the diacritical vowel marks; the English vowels can also be represented by using the *aksharas* that represent vowels on their own (which differ from

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the vowel diacritical marks). The name of the akshara is also the sound of the akshara, hence there is an almost one to one correspondence between sound and akshara. This opens up the possibility of the Kannada aksharas being used as an intermediary for learning English letter sounds, instead of by direct instruction.

Kannada literacy is not taught in a phonic manner, an alphabetic approach which involves learning and using grapheme to phoneme correspondences; furthermore, given the syllabic nature of the script, teaching children to read syllables represented by aksharas and blending the sounds together might be more appropriate. However, for English it has been found that systematic phonics instruction is more effective for teaching reading than non-phonics methods. After conducting a meta-analysis of 38 studies with 66 different treatments published in peer-reviewed journals since 1970, the National Reading Panel [NRP, National Institute of Child Health and Human Development (NICHD), (2000)] concluded that systematic phonics instruction, whether it was synthetic phonics or analytic phonics, was beneficial in beginning reading instruction. However, systematic synthetic phonics instruction had greater effect sizes, particularly in the early stages. In synthetic phonics instruction, children learn letter-sound correspondences very rapidly; after learning a few correspondences they learn to sound and blend the letters in unfamiliar words in order to read them. In analytic phonics, words are introduced for sight word reading first and then the letter sounds are taught in the initial, final, and then middle position of words; at this point sounding and blending may or may not be taught. Later on children learn about word families, seeing blocks of words with the same spelling patterns (Johnston & Watson, 2007). The two methods, therefore, do teach, either earlier or later on, at the grapheme-phoneme correspondence level. The results of the NRP meta-analysis further showed that the effects of systematic phonics instruction were statistically larger for facilitating reading acquisition at kindergarten and first grade levels than for second through sixth grades. Based on the results, the NRP recommended that continuous instruction in systematic phonics for 2–3 years is valuable.

In a series of experiments conducted by Johnston and her colleagues since the publication of the report by the NRP (NICHD, 2000), it has been shown that systematic synthetic phonics instruction was better than analytic phonics instruction in developing phonemic awareness, word reading, spelling and reading comprehension. Further, the benefits of early systematic synthetic phonics instruction remained even after seven years of schooling, and the instruction was especially beneficial for boys (Johnston, McGeown, & Watson, 2012; Johnston & Watson, 2004, 2006, 2007). Similar results have been obtained in the US from a series of studies by Foorman and her colleagues, which showed that a training programme that taught phoneme awareness, plus a phonics approach where blending was a key strategy, was better in improving reading and spelling skills compared to embedded phonics instruction (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Foorman, Francis, Shaywitz, Shaywitz, & Fletcher, 1997; Foorman et al., 2003).

Even though systematic synthetic phonics instruction has been proven to be successful from studies by Johnston, Foorman and their colleagues, as well as from the meta-analysis of the NRP (NICHD, 2000), most of the studies were conducted in English. Cheung et al. (2011), after conducting a series of studies on literacy acquisition in monolinguals and bilinguals of English (alphabetic), Chinese (morphosyllabic), and Korean (alpha-syllabic) languages, suggested that the use of an auxiliary alphabet that represented phoneme level information for readers of Chinese, or which emphasized the letters embedded in Korean eumjeols, would probably facilitate their learning to read English. However, children literate in alpha-syllabic Kannada would not need to learn an auxiliary alphabet as the aksharas lend themselves to being used to represent the sounds of the English alphabet; that is, existing knowledge of the aksharas could be used as mnemonics to acquire the English letter sounds. Shmidman and Ehri

(2010) found that English speaking pre-schoolers learned Hebrew letter sounds better if they were accompanied by mnemonics where the letters were embedded in drawings of objects, such that the objects looked like the Hebrew letter and the English name of the object started with the sound of the Hebrew letter.

We hypothesized that teaching children to read by synthetic phonics would be more effective than the traditional rote learning method, and that these gains with synthetic phonics teaching would be increased by teaching English letter sounds via Kannada aksharas. Such findings would significantly aid the development of English literacy skills in the State of Karnataka in India.

## 2. Methods

### 2.1. Participants

The participants for the present study were selected from three schools from one town in the state of Karnataka, India. Based on parents' education and income, the schools can be described as economically disadvantaged. Using the *Socioeconomic Status Scale* (Venkatesan, 2009), the children scored in the lowest SES category (i.e., 1). These children's parents were illiterate, they were unemployed or had unskilled jobs, and had a pooled monthly income of Rs 5000 or below (\$1 = around 54 rupees). The children started school when they were six years of age in Grade 1 and the language of instruction was Kannada. English is introduced as a second language beginning in Grade 3. However, the method of instruction can be classified as rote memorization, with no systematic instruction being provided in learning to read either in the first language or in the second language. In the PISA + cross-national comparison of reading, attainment in two higher performing states in India has been found to be low (Walker, 2011). In Tamil Nadu, for example, it was found that only 17% of students had a proficiency in reading literacy at or above the baseline 'needed to participate effectively and productively in life', whereas the OECD average was 81%. Given the lack of standardized tests, informal tests of decoding and reading in Kannada were conducted in three schools by using an Akshara Identification test, and measures of reading words in passages, passage reading speed, and reading comprehension. These tests were administered to all the students in Grade 5. Based on the performance on these tasks, students were classified on a 5-point scale as very good, good, average, poor, and very poor. Only the first twenty students in each school who scored 'very good' or 'good' were selected for the study since, according to LIH, a good foundation of literacy skills in L1 is needed to master literacy skills in L2. Schools were randomly allocated to one of three conditions. The 20 students in the school assigned to treatment group 1, who received the Samveda Synthetic Phonics Instruction Program (SSPP) with Kannada aksharas, had a mean age of 10 years and 3 months, S.D. = 0.5; the 20 students in the school assigned to treatment group II, who received SSPP instruction without Kannada aksharas, had a mean age of 10.0, S.D. = 0.7; the 20 students in the school assigned to be the comparison group, who carried out their normal classroom program and did not receive synthetic phonics instruction, had a mean age of 10.0, S.D. = 0.6. There was no significant age difference among the three groups,  $F(2,57) = 2.32, p > .05$ .

### 2.2. Instruments

These tasks were carried out as pre-tests and were repeated as post-tests after the 5 week training programs.

#### I Literacy skills

##### a) Dictation of upper-case letters.

The name of each letter was read aloud by the experimenter, and the participants were asked to write it in upper-case letters. The letters were as follows: D, F, O, A, H, I, V, G, B, Y.

- b) Letter names.  
A list of 10 letters of the English alphabet, in lower case print, was presented to the children and they were asked to pronounce the letter names. The letters were: c, x, d, w, t, m, a, u, l, r.
- c) Alphabetic order.  
Twenty letters from the English alphabet were printed in random order on an A4 sheet of paper and the participants were asked to write the letters in alphabetical order on an A4 sheet of paper. The letters, in the order presented, were: p, k, s, j, f, i, n, g, q, c, t, d, a, c, u, w, x, v, z, y.
- d) Dictation of lower-case letters.  
The experimenter orally named the letters of the alphabet and the participants were asked to write the dictated letter names in lower case. The letters were: b, y, s, k, n, e, j, o, l, p, w.
- e) Spelling.  
A list of ten 2 and 3 letter words (VC, CV, and CVC) was dictated to the participants. They were: in, cop, ten, be, up, so, bun, lap, win, on.
- f) Names/sounds of the letters and akshara correspondences.  
The participants were presented with 10 printed English letters on an A4 sheet of paper and were asked to write the names and the sounds in Kannada aksharas, gaining a score of 0.5 for each correct answer. If they gave an incorrect answer, participants were asked to give the name or sound orally and got a score if it was correct. The letters were: p, t, k, s, d, l, g, n, w, h. The maximum score was 13, as letter–sound teaching has to represent Indian English (as in, for example, place names). For example, 'l' has two sounds /l/ and L'~, the latter sound being a voiced retroflex, lateral. Mean scores for correct names and correct sounds were calculated separately.
- g) Word reading task.  
The participants were asked to read aloud 10 words from an A4 sheet of paper, i.e. NEW, ANY, WHY, DAY, AS, OUR, ME, HIS, OUT, OFF.
- h) Nonword reading task.  
The participants were asked to read 10 non-words, i.e. HIG, NAL, KUG, BIS, GOK, DEP, FOY, KUN, GED, LAR.
- II Graphophonological awareness
- a) Grapho-phoneme segmentation.  
Using a list of 10 CVC, VC, and CV words, the children were asked to read the words, and then isolate the phonemes, e.g. cat → /c/ /a/ /t/. The children were expected to divide the word into its phonemes by putting in the slash marks and then saying the phonemes. Here, to represent phonemes, Kannada aksharas were not written but the student was expected to pronounce the phonemes out loud. The items were: cat, pet, put, it, to, so, bit, rat, bow, hat.
- b) Grapho-phoneme deletion.  
Using a list of 10 words (CVC), the children were asked to read the words, delete the first phoneme, and then write down the remaining part of the word and then they were asked to read the word without the initial phoneme. The words were: net, pit, bun, tap, cot, van, let, sit, sun, lot.
- c) Grapho-phoneme reversal.  
Using a list of 10 CVC words, the children were asked to read a word and then say it in reverse, e.g. fit → tif. The words used were: sap, bid, dot, sup, fit, tan, den, get, sub, not.
- d) Generating grapho-rhymes.  
The children read a list of 10 words, and for each word wrote a rhyming word. The words used were: hop, tall, hen, dog, man, coat, tail, door, tin, tree.

### 3. Procedure

The medium of instruction in the schools was Kannada, but the children had some exposure to the English language from Grade 3. The aim

was to develop English listening and speaking skills, rather than reading and writing skills. Instruction involved the teacher reading out sentences in the text book, with the children repeating the sentences whilst looking at the text. Thus, any learning of the printed word in English would be by sight, and would be incidental. However, children learned the names for upper-case letters, learned how to write them, and also learned how to put them in alphabetic order. Pilot work at the start of grade 5 showed that the participants in the study could not converse in English, nor could they read independently from the text book prescribed and published by the Government of Karnataka (Department of Education, 2009). The training sessions were as follows, and lasted for an hour each day, for 5 weeks.

#### Treatment Group 1: Samveda Synthetic Phonics Program (SSPP).

In this condition, the approach was based on learning to read in English using a synthetic phonics approach, that is, children were taught early on to sound and blend the letters in unfamiliar words in order to decode them. However, there were a number of modifications of this approach, capitalising on the fact that in Kannada there are aksharas for 14 vowels and 34 consonants that approximate to many of the letter sounds used in English. In the first week of the program the children learnt the English letter names and how to write them. Then, instead of solely teaching English letter sounds, Kannada aksharas were also taught, at the rate of 4 to 5 English letter–akshara correspondences for consonants a day. In the daily lesson, the children saw on the blackboard an English consonant with the corresponding Kannada akshara alongside it; next to that was an English word containing the target letter. Thus the children saw, for example, the letter 'l', heard its sound /l/ spoken by the teacher, and saw it represented by a Kannada akshara; they also saw the letter highlighted in an English word, e.g. lion, and heard it pronounced by the teacher. The children then wrote the English letter, the Kannada akshara and the English word containing the target letter. The teacher checked what the children had copied from the board. After the 4–5 English consonants and the corresponding Kannada aksharas for the day had been taught in this way, the teacher would revise what had been taught. A table containing the English consonants and their sounds as represented by the base Kannada aksharas (with no vowel diacritic marks) is provided in [Appendix A](#).

Once the consonants had been taught, the children learnt vowels in the context of vowel–consonant phonograms, blending the vowels and consonants together, e.g., 'ab', 'em', and 'og'. The phonogram training was done initially by introducing only two sounds of a vowel (CV and VC). For example, the phonogram 'ab' was written on the board. The sound of the vowel /a/ was shown with a curved line pointing to a Kannada akshara. No support was given for /b/ as that had already been learnt via Kannada akshara. Thus the combined sound of /ab/ was not represented using Kannada aksharas. The Kannada akshara support for vowel learning was withdrawn when the teacher deemed that the sound of the English letter had been learnt by the class. Vowel digraphs were also introduced in this way, and occasionally additional symbols were added to the akshara to represent the sounds more closely. The teacher showed the phonogram composed of the taught English letters on the board, and modelled sounding and blending. The children then pronounced each sound and then they blended the letter sounds to pronounce the whole item. The teaching was reinforced by the singing of phonogram songs, which were also written on the board. Later, CVC words were introduced, linking a consonant to already learnt phonograms, e.g., c-ab, and the children then sounded and blended these words. Towards the end of the program, for 5 min a day they saw printed words and drew boxes around the vowels in each word. Irregularly spelled words were taught in a way that demonstrated that words with similar spellings could have different pronunciations, e.g. 'but'–'put',

'head'–'read', to make it clear that English, unlike Kannada, has a deep orthography. Words such as 'the' were presented as sight words, to be learned by repeated exposures. A typical one-hour lesson had 10 min reviewing the previous day's work, 20 min was spent in letter–sound learning, 10 min in blending, 10 min singing phonogram songs, and 10 min playing a game to reinforce letter names and sounds learning.

Treatment Group 2: Conventional Synthetic phonics program (CSPP).

This program followed the same principles as the SSPP, including a week of learning the English letter names and how to write them, but the children were not taught English letter sounds via Kannada aksharas. They learnt the English letter–sound correspondences directly, covering the same consonants, vowels and vowel digraphs, and learning to sound and blend for reading, like the SSPP group.

#### 4. Comparison group

The participants in this group continued the work they had learned in Grades 3 and 4, learning to repeat sentences in English from the text books.

The training sessions in treatment groups 1 and 2 were implemented by authors 1 and 4, who were postgraduate students in Psychology. The comparison group was taught by a qualified primary school teacher who taught the government prescribed English text book.

The person who carried out the testing was another postgraduate Psychology student who was blind to the treatments received by the three groups. After the final data were collected, the comparison group received the same program for ethical reasons.

#### 5. Results

One way analyses of covariance were carried out on post-test scores, controlling for pre-test scores. There was one between subjects factor, groups (treatment group 1, treatment group 2, and comparison

group 3). Unadjusted means and standard deviations are shown for pre-tests and post-tests in Table 1, and adjusted means and standard deviations for post-tests are shown in Table 2. The analyses of covariance are summarized in Table 3.

#### I Literacy skills

- a) Dictation of upper-case letters, and b) Letter names: there were no main effects of groups,  $F(2,56) = 1.40$ ,  $p > .05$ , partial eta squared = 0.05, and  $F(2,56) = 2.23$ ,  $p > .05$ , partial eta squared = 0.07, respectively.
- b) Alphabetic order. There was a main effect of groups at post-test,  $F(2,56) = 13.13$ ,  $p < .001$ , partial eta squared = 0.32. Newman Keuls tests showed that treatment groups 1 and 2 did not differ, and both performed better than the comparison group ( $p < .01$  in both cases).
- c) Dictation of lower-case letters. There was a main effect of groups,  $F(2,56) = 9.82$ ,  $p < .001$ , partial eta squared = 0.26. Newman Keuls tests showed that treatment group 1 performed better than the other two groups,  $p < .01$  in both cases, who did not differ from each other.
- d) Spelling. There was a main effect of groups,  $F(2,56) = 44.38$ ,  $p < .001$ , partial eta squared 0.61. Newman Keuls tests showed that treatment group 1 performed better than both treatment group 2 and the comparison group ( $p < .01$ ), who did not differ from each other.
- e) Names/sounds of the letters and akshara correspondences. For the letter names analysis, there was a main effect of groups at post-test,  $F(2,56) = 84.11$ ,  $p < .001$ , partial eta squared = 0.75. Newman Keuls tests showed that the two treatment groups performed equally well, and both performed better than the comparison group ( $p < .01$  in both cases). For the letter sounds analysis, there was a main effect of groups,  $F(2,56) = 112.24$ ,  $p < .001$ , partial eta squared = 0.80. Newman Keuls tests showed that treatment group 1 performed

**Table 1**  
Mean scores on literacy and graphophonological awareness measures, pre- and post-test (standard deviations in parentheses).

Tasks	Treatment Group 1		Treatment Group 2		Comparison Group 3	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Writing upper case letter names to dictation	9.40 (1.00)	9.65 (1.14)	9.20 (1.10)	9.60 (0.68)	8.75 (1.62)	8.90 (1.52)
Pronouncing letter names	9.20 (1.24)	9.30 (0.98)	9.55 (1.00)	9.70 (0.57)	9.00 (0.97)	9.00 (0.86)
Writing letters in alphabetic order	14.85 (5.35)	18.35 (1.35)	13.70 (6.22)	17.75 (2.29)	17.20 (1.51)	15.75 (3.21)
Writing lower case letter names to dictation	7.90 (2.63)	8.80 (1.32)	6.75 (3.16)	7.00 (1.62)	6.10 (1.17)	6.55 (1.40)
Spelling	2.10 (2.47)	6.35 (2.43)	1.10 (1.17)	2.50 (1.15)	1.50 (1.70)	1.95 (2.09)
Writing letter names as aksharas	3.05 (1.96)	5.00 (0.00)	4.00 (1.38)	4.95 (0.39)	1.40 (1.19)	1.40 (1.35)
Writing letter sounds as aksharas	0.80 (1.32)	4.55 (0.83)	0.70 (1.42)	1.70 (1.53)	0.00 (0.00)	0.00 (0.00)
Word Reading	2.40 (3.09)	6.85 (1.73)	1.15 (2.43)	3.95 (1.61)	1.40 (0.94)	1.50 (1.24)
Nonword Reading	2.30 (2.70)	8.70 (1.42)	1.60 (2.46)	4.40 (2.01)	1.20 (1.77)	1.80 (2.46)
Grapho-phoneme segmentation	2.05 (2.3)	9.00 (1.59)	3.45 (2.28)	6.60 (1.54)	1.25 (1.33)	1.55 (1.76)
Grapho-phoneme deletion	2.45 (2.84)	8.85 (1.63)	3.30 (2.66)	5.00 (1.72)	0.70 (0.92)	1.05 (1.61)
Grapho-phoneme reversal	2.10 (2.81)	12.90 (20.81)	2.70 (2.47)	6.50 (1.40)	1.45 (1.28)	1.15 (1.53)
Grapho-rhymes	1.25 (1.92)	7.60 (1.90)	0.95 (1.05)	5.15 (1.42)	0.85 (0.93)	0.85 (1.14)

**Table 2**

Post-test mean scores, adjusted for pre-test scores, on literacy and graphophonological awareness measures (standard deviations in parentheses).

Tasks	Treatment Group 1	Treatment Group 2	Comparison Group 3
Writing upper case letter names to dictation	9.52 (1.04)	9.56 (1.09)	9.06 (1.05)
Pronouncing letter names	9.32 (0.71)	9.58 (0.72)	9.10 (0.72)
Writing letters in alphabetic order	18.45 (2.10)	18.14 (2.13)	15.26 (2.15)
Writing lower case letter names to dictation	8.59 (1.40)	7.04 (0.07)	6.73 (1.40)
Spelling	5.94 (1.40)	2.86 (1.40)	2.00 (1.37)
Writing letter names as aksharas	4.95 (0.75)	4.69 (0.82)	1.71 (0.85)
Writing letter sounds as aksharas	4.14 (0.88)	1.61 (0.88)	0.23 (0.90)
Word Reading	6.61 (1.37)	4.11 (1.36)	1.58 (1.35)
Nonword Reading	8.42 (1.72)	4.45 (1.70)	2.04 (1.71)
Grapho-phoneme segmentation	9.09 (1.40)	6.09 (1.49)	1.97 (1.46)
Grapho-phoneme deletion	8.76 (1.52)	4.66 (1.58)	1.48 (1.61)
Grapho-phoneme reversal	8.35 (1.46)	6.32 (1.48)	1.33 (1.48)
Grapho-rhymes	7.50 (1.42)	5.18 (1.42)	0.92 (1.42)

better than treatment group 2 and the comparison group ( $p < .01$  in both cases), and that treatment group 2 performed better than the comparison group ( $p < .01$ ).

f) Word reading.

There was a main effect of groups,  $F(2,56) = 67.23$ ,  $p < .001$ , partial eta squared = 0.71. Newman Keuls tests showed that treatment group 1 performed better than both treatment group 2 and the comparison group ( $p < .01$ ); treatment group 2 performed better than the comparison group ( $p < .01$ ).

g) Nonword reading.

There was a main effect of groups,  $F(2,56) = 69.43$ ,  $p < .001$ , partial eta squared = 0.71. Newman Keuls tests showed that treatment group 1 performed better than treatment group 2 and the comparison group ( $p < .01$  in both cases), and treatment group 2 performed better than the comparison group ( $p < .01$ ).

II Graphophonological awareness

a) Grapho-phoneme segmentation.

There was a main effect of groups,  $F(2,56) = 125.44$ ,  $p < .001$ , partial eta squared = 0.82. Newman Keuls tests showed that at post-test, treatment group 1 performed better than treatment

group 2 and the comparison group ( $p < .01$  in both cases), and treatment group 2 performed better than the comparison group ( $p < .01$ ).

b) Grapho-phoneme deletion.

There was a main effect of groups,  $F(2,56) = 108.16$ ,  $p < .001$ , partial eta squared = 0.79. Newman Keuls tests showed that treatment group 1 performed better than treatment group 2 and the comparison group at post-test ( $p < .01$  in both cases), and treatment group 2 performed better than the comparison group ( $p < .01$ ).

c) Grapho-phoneme reversal.

There was a main effect of groups,  $F(2,57) = 119.29$ ,  $p < .001$ , partial eta squared = 0.81. Newman Keuls tests shows that treatment group 1 performed better than treatment group 2 and the comparison group ( $p < .01$  in both cases), and treatment group 2 performed better than the comparison group ( $p < .01$ ).

d) Generating grapho-rhymes.

There was a main effect of groups,  $F(2,56) = 109.49$ ,  $p < .001$ , partial eta squared = 0.80. Newman Keuls tests showed that treatment group 1 performed better than treatment group 2 and the comparison group ( $p < .01$  in both cases), and treatment group 2 performed better than the comparison group ( $p < .01$ ).

According to Cohen (1988, p. 283), a partial eta squared of 0.0099 is small, 0.0588 is medium, and 0.1379 is large. For all but two measures, partial eta squared is large in these analyses. There are medium partial eta squared values for writing upper case letters to dictation, and for pronouncing letter names, but the ANCOVAs show no group differences. Letter names were taught to all classes, including comparison group 3, so although there is a trend towards better performance for treatment groups 1 and 2, these differences were not large enough to be statistically significant.

## 6. Discussion

It was found that Kannada speaking children learning to read English were able to benefit from a phonics approach, even though many of the words on which they were tested were unlikely to be in their oral vocabularies. On the other hand, the strategy of using textbooks to accompany the development of speaking and listening skills was much less effective in developing reading skills. Furthermore, it was found that learning letter sounds via the medium of Kannada aksharas led to significantly better knowledge of English letter sounds than direct teaching of the associations, and also to better word reading, nonword reading, spelling and graphophonological awareness skills. Although reading comprehension was not measured, good word reading is a fundamental skill in developing understanding of text (Gough & Tunmer, 1986).

In considering second language learning, Leikin, Share, and Schwartz (2005) have contrasted *linguistic* competence, i.e. basic phonological processing abilities that arise from spoken language development such as working memory, with *metalinguistic* skill, such as abstract phonological awareness, which is closely associated with alphabetic literacy development in languages such as English. Given the emphasis in the literature on the development of phoneme awareness skills as a precursor to learning to read in English (e.g. Stanovich & Siegel, 1994; Torgesen, Wagner, & Rashotte, 1994), it might seem that having achieved literacy in a first language where the orthography does little to develop encoding of the language at the phonemic level, it might be necessary to develop phoneme awareness in the second language before starting instruction. That is, it might be deemed necessary to develop the *metalinguistic* competence of the second language speaker in order to emulate the pre-reading skills of the native speaker of English. However, another approach is to develop the necessary metalinguistic skills directly by teaching the letter-sound

**Table 3**

Results of analyses of covariance, controlling for pre-test scores, on post-test literacy and graphophonological awareness measures.

Tasks	Between group comparisons
Writing upper case letter names to dictation	1 = 2 = 3 $F(2,56) = 1.40$ , $p > .05$ , $\eta_p^2 = 0.05$
Pronouncing letter names	1 = 2 = 3 $F(2,56) = 2.23$ , $p > .05$ , $\eta_p^2 = 0.07$
Writing letters in alphabetic order	1 = 2; 1,2 > 3 $F(2,56) = 13.13$ , $p < .001$ , $\eta_p^2 = 0.32$
Writing lower case letter names to dictation	1 > 2,3; 2 = 3 $F(2,56) = 9.82$ , $p < .001$ , $\eta_p^2 = 0.26$
Spelling	1 > 2,3; 2 = 3 $F(2,56) = 44.38$ , $p < .001$ , $\eta_p^2 = 0.61$
Writing letter names as aksharas	1 = 2; 1,2 > 3 $F(2,56) = 84.11$ , $p < .001$ , $\eta_p^2 = 0.75$
Writing letter sounds as aksharas	1 > 2,3; 2 > 3 $F(2,56) = 112.24$ , $p < .001$ , $\eta_p^2 = 0.80$
Word Reading	1 > 2,3; 2 > 3 $F(2,56) = 67.23$ , $p < .001$ , $\eta_p^2 = 0.71$
Nonword Reading	1 > 2,3; 2 > 3 $F(2,56) = 69.43$ , $p < .001$ , $\eta_p^2 = 0.71$
Grapho-phoneme segmentation	1 > 2,3; 2 > 3 $F(2,56) = 125.44$ , $p < .001$ , $\eta_p^2 = 0.82$
Grapho-phoneme deletion	1 > 2,3; 2 > 3 $F(2,56) = 108.16$ , $p < .001$ , $\eta_p^2 = 0.79$
Grapho-phoneme reversal	1 > 2,3; 2 > 3 $F(2,56) = 119.29$ , $p < .001$ , $\eta_p^2 = 0.81$
Grapho-rhymes	1 > 2,3; 2 > 3 $F(2,56) = 109.49$ , $p < .001$ , $\eta_p^2 = 0.80$

1 > 3 etc.: treatment group 1 performed better than comparison group 3,  $p < .05$  at least.

correspondences. All of the groups in the present study had been exposed to spoken English where the printed version was presented in textbooks, and only letter names were taught, but for the comparison group it was found that this approach did not facilitate reading English. Teaching children the English letter sounds in order to read alphabetically was the better approach, as was shown by the performance of treatment group 2. However, treatment group 1 performed even better than treatment group 2, having been taught by an approach which built on the children's existing metalinguistic knowledge (i.e. of Kannada aksharas) and using that information as the foundation on which to develop knowledge of English letter–sound correspondences. It is possible that the children taught English letter sounds directly would ultimately have caught up with the other phonics-taught group, but it was not possible to assess this in the present study as these children were subsequently taught via the Kannada aksharas for ethical reasons. Clearly, Kannada is unusual in that its script can be decomposed to represent English phonemes reasonably well, so this teaching of letter sounds via the intermediary of Kannada aksharas cannot be emulated in many other writing systems.

These findings support Cheung et al.'s (2011) suggestion that if Chinese and Korean are taught in an alphabetic way, the reading of English will be facilitated. The reading and writing of Kannada is not taught in an alphabetic way, but Kannada aksharas, which largely represent syllables, lend themselves to being deconstructed for use in an alphabetic manner. Prior learning of the Kannada aksharas was shown to be a very effective stepping stone for learning the English sounds for the Roman alphabet, and for facilitating the effective use of the synthetic phonics method.

The Kannada-mediated synthetic phonics approach facilitated both the children's graphophonological knowledge and their reading and spelling skills, supporting the conclusion of the National Reading Panel that learning phonemic awareness in the context of print and letters is an effective way to develop reading skills (Ehri, Nunes, Stahl, & Willow, 2001). It might be suggested that if the children in the present study had a prior program to develop their phoneme awareness skills they might have done even better, but that seems unlikely given Johnston and Watson's (2004) finding that, even for English speaking children, phonemic awareness training plus analytic phonics teaching led to less of a boost to phoneme awareness (and reading and spelling) than did synthetic phonics teaching.

If a child learnt to read in L1 using an alphabet where the letters had different pronunciations to those used in L2, there might be some confusion about which sound corresponds to a letter. However, it has been found that children can learn to read using two alphabetic systems where some of the letter sounds look similar but have a different pronunciation. Two alphabet systems were taught in the former Yugoslavia; the Cyrillic alphabet was dominant in the east and the Roman alphabet in the west, but both scripts were learned without difficulty by children early on in their schooling (Lukatela, Savic, Ognjenovic, & Turvey, 1978). Therefore, there seems to be no reason why children whose first language is represented by an orthography that is similar to the Roman alphabet should not also learn to read by a phonics approach when learning English.

In conclusion, this study has shown that it is possible to teach children learning to read English as a foreign language a) by a phonics approach, and b) by tapping into metalinguistic knowledge from L1, via the intermediary of known sound–symbol associations from that language. No attempt was made to teach reading beyond the word recognition level, the approach was to teach the participants how to sound and blend letters in order to read unfamiliar words in order to establish a basis for fluent text reading. In just 5 weeks, the children taught by this L1-enhanced synthetic phonics approach made significant gains in the building blocks for fluent text reading, that is, graphophonological awareness, word reading, and nonword reading. In addition, their spelling skills were significantly enhanced.

## Appendix A

Table showing consonant letter sounds (single) using Kannada aksharas and special symbols.

English consonants	IPA	Kannada aksharas and special symbols
B	b	ಬ
F	f	ಫ
H	h	ಹ
J	d <sub>3</sub>	ಜ
K	k	ಕ
M	m	ಮ
V	v	ವ
P	p	ಪ
R	r	ರ
S	s	ಸ
W	w	ವ್ವ
Z	z	ಝ

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