

Comparison of Phonological Awareness Skills in Children in English with Diverse Native Languages

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Abstract: *The children in multilingual education system often learn to read a language that is not spoken at home for many reasons. Even, the child's L1 and L2 may be distinct in phonological and orthographical structure. The question on relative advantage of child's native language on L2 phonological acquisition is unclear. The present study compared phonological awareness skills of primary school children learning English with varied alpha syllabic native language (L1) background. The phonological awareness skills were assessed in 20 typically developing children each from 5 different native languages such as Kannada, Tulu, Konkani, Telugu and Malayalam. These children are designated as English language learners, since they were studying in primary school with English as a medium of instructions within the age range of 8.7 – 9.6 years. Children were divided into five groups based on the native language which was ascertained by questionnaire administered on parents. Subsequent comparison of phonological awareness skills between all the five groups using ANOVA revealed no significant difference in the performance between the language groups. The study concluded that, irrespective of alphasyllabary native language spoken at home, had no relative advantage in acquiring phonological awareness skills in English learnt as a second language in primary school.*

Key words: *Phonological awareness, alphasyllabary, reading, native language*

Introduction

Phonological awareness is one of the extensively researched topic in reading acquisition and reading impairments. Phonological awareness is one's explicit awareness that oral language contains sentences; sentences are made up of words; words are made up of syllables; syllables contains phonemes and finally the manipulation of phonemes changes the word meaning. Anthony and Francis (2005) defined phonological awareness as one's ability to recognize, discriminate, and manipulate the sounds in one's language, regardless of the size of the word unit. Further, it's the child's explicit ability to reflect on his own structural features of oral language skills. Thus, phonological awareness skills were regarded as metalinguistic ability (Lieberman, 1973; Kavanagh, 1972). However, in relation with reading it can be simply stated as, one's awareness that the individual speech segment can be represented in the written form through orthographic system specific to one's own language. Phonological awareness has been regarded as one of the important keys to unlock and relate oral language to written language acquisition. The last four decades of research has provided the ample evidence on the importance of phonological awareness in reading acquisition (Stanovich, Cunningham, & Cramer, 1984; Torneus, 1984; Tunmer, Herriman, & Nesdale, 1988; Vellutino & Scanlon, 1987; Lyon, 1996). In order to determine the importance of phonological awareness in reading, the results of the various longitudinal studies indicated phonological awareness as one of the most powerful predictors of subsequent word decoding abilities (Lundberg, Olofsson, & Wall, 1980; Lundberg, Frost, & Peterson, 1988; Bradley & Bryant, 1991; Wagner, Torgesen, & Rashotte, 1994; Hulme, 2002). The relative contribution of phonological awareness in reading acquisition comes from various intervention studies exploring the efficacy of phonological awareness training in pre-school children at various levels of phonological awareness (Fox & Routh, 1984; Cunningham, 1990; Tangel & Blachman, 1992; van Kleeck, Gillam, & McFadden, 1998; Majsterek, Shorr, & Erion, 2000; Mitchell & Fox, 2001) and improvement in phonological awareness skills will further improve word reading skills (Bus & Van IJzendoorn, 1999; Ehri, Nunes, Stahl, & Willows 2001). At the time of learning to read, better the child's phonological awareness abilities, better is the tendency to acquire reading skills.

The failure to utilize the phonological information in decoding the words predominantly observed in children with dyslexia, is considered to be an important contributing factor to developmental dyslexia (Constable, Stackhouse, & Wells, 1997; Snowling, 2000). However, irrespective of type of language and its orthographical nature which may or may not have one to one correspondence between phonemes to grapheme, the concern about reading acquisition and its failures escalates due to the world wide prevalence of biliteracy. Biliteracy refers to acquiring reading and writing skills through formal teaching in more than one language and is the scenario in India. Current literacy system in India employs three-language formula. Many school children

become skilled at reading in a language different from the one they have learnt at home. Children are admitted to the schools with the medium of instructions being English, a foreign language differing both in phonological, syntactical and even orthographical structures from Indian languages. Most of the south Indian languages in the current study are alphasyllabary in nature and exhibit high level of phonologic to orthographic consistency compared to English which is alphabetical in nature. Bialystok, Luk, and Kwan (2005) hypothesized that, bilingual children may perform differently from monolingual children because, bilingual children acquire many related skills for literacy and also have the opportunity to transfer the skills acquired for reading in one language to other. However, the phenomenon of cross-linguistic transfer depends on the commonalities between the two writing systems and cognitive skills required for reading. They compared the performance on phoneme segmentation skills along with other early literacy skills of three bilingual group with different combination of languages and writing systems with that of monolingual English group belonging to first grade. The results indicated that, the Hebrew-English and Spanish-English bilingual group outperformed monolingual English group and Chinese-English group which was attributed to the orthographic and phonological similarities between Hebrew and Spanish with English. These results indicate the existence of bilingual advantage even on phonological awareness skills if the languages are similar in various dimensions.

A study in alphasyllabary languages, Prema (2006) compared phonological awareness skills in mono-literate Kannada with children having different native languages such as Kannada, Telugu, Tamil & Malayalam languages. The results indicated that, there was no statistically significant difference between Tamil-Kannada, Telugu-Kannada and Kannada-Kannada Groups. However, there was significant difference seen among Malayalam-Kannada Group only. This result indicates that, there is minimal effect of native language on Kannada which also belongs to alphasyllabary. However, they attributed the variation in the performance to subtle differences seen in the language structures.

The effect of bilingualism on literacy skills with various language combinations and also the cross-linguistic transfer of early literacy skills between L1 and L2 has been well researched. However, there is little research focus on phonological awareness skills of children from various native language groups, assessed in English. Most often the phonological and orthographical nature of Indian native languages are quite different from that of English. These comparisons can be explicitly possible only in the countries where multilingualism is the scenario like that of India. The growing English language learners in the country with English as a medium of instructions in primary schools, it would be interesting to understand the nature of phonological awareness skills in children in English, an alphabetical language with different linguistic

background. However, considering the high level of similarities in terms of phonological and orthographical characteristics of South Indian languages in the current study, we hypothesize that, there will not be significant difference between different language groups on phonological awareness skills assessed in English. Hence, the current study aimed to assess phonological awareness skills in the English in typically developing children within the age range of 8.6 to 9.7 years, with native languages such as Kannada, Tulu, Konkani, Telugu, and Malayalam, to establish the influence of native languages on phonological awareness skills in English.

Method

The study protocol was approved by the institutional ethical committee.

Participants

A total of 100 typically developing children within the age range of 8.7 – 9.6 years were included in the study. The study incorporated cross sectional study design with a convenient sampling to select the participants. Based on the language spoken at home, the participants were divided into five groups with 20 children in each group designated as Group 1, Group 2, Group 3, Group 4 and Group 5 with Kannada, Tulu, Konkani, Telugu and Malayalam language groups respectively. The participants were selected from various English medium schools for typically developing children following state syllabus. According to the initial survey, there was no significant difference in the school curriculum. All the schools had either, Kannada, Malayalam, Telugu as a subject and rest of the subjects were taught in English. However, children from Tulu and Konkani language group had Kannada language as a subject, due lack of specific script for Tulu and Konkani.

Table 1

Details of the participants of different language Groups

Groups	Languages	Age range	Mean age	Total
1	Kannada	8.7-9.6	9.1	20
2	Tulu	8.7-9.6	9.4	20
3	Konkani	8.7-9.6	9.3	20
4	Telugu	8.7-9.6	8.9	20
5	Malayalam	8.7-9.6	9.2	20
Total				100

Material

Participant's native language was determined using a questionnaire developed specifically for the study requirements. The questions also probed the language selection for communication interaction within or across the family by family members and others. The questionnaire was developed such that it mainly consisted of questions regarding child's usage of language in different situations or context like with peer group, family members and others. The questionnaire contained 10 questions with 5 point rating scale where always being 4 to never being 0. Subsequently, the percentage of the scores was determined. In order to consider the participant belonging to specific native language, a cut off score of 90 % was considered as criteria. In order to assess phonological awareness, due to the unavailability of the standardized test material normed for Indian population, the tasks were separately developed utilizing the literature and tests for western population. The stimuli were selected from child's core curriculum and validated by 5 subject experts. The test contained tasks at syllable level, rhyme level and phoneme level as shown in the table 2.

Table: 2

Details of different tasks for assessing Phonological awareness

Syllable level	Rhyme level	Phoneme level
Syllable blending	Rhyme recognition	Phoneme Deletion
Syllable segmentation	Rhyme oddity	Phoneme Addition
Syllable deletion	Rhyme production	Phoneme Substitution
Syllable identification	Onset-rime Blending	Phoneme matching
Syllable reversals	Onset-rime segmentation	Phoneme isolation
Syllable identity	Rhyme recognition	Phoneme Deletion

Procedure

An informed consent was obtained from the school authorities and parents of the participants before recruiting the children for the study. Initially, the participant details on native language were obtained through the child interview with the questions probing the selection of language for regular conversation of parents and the child at home. The linguistic background information was further supplemented through class teacher's inputs. Afterwards the participants were given a questionnaire with self-explanatory instructions and also a form to be filled by the parents in order to determine the participant's native language. Subsequent to selection of the participants

based on the questionnaire, the participants were assessed individually with various phonological awareness tasks at syllable, rhyme and phoneme levels. During the course of administration, the tasks were familiarized to the child using practice items, before actual assessment began.

Subsequent to data collection, the raw scores for each task were tabulated and then subjected to statistical analysis using the SPSS software version 17.0. Due to the variations in the number of stimuli used across the task, the mean scores obtained were also variable. Therefore, the mean scores were converted into percentage scores for the purpose of comparison of performance across the tasks. The percentage scores were summarized in terms of mean and standard deviation using descriptive statistics. In order to investigate the effect of native language, one-way ANOVA was carried out by comparing the mean scores on all the tasks between the five groups. If there was significant difference between the groups, pair-wise comparison was done using post-hoc Bonferroni adjustments.

Results & Discussion

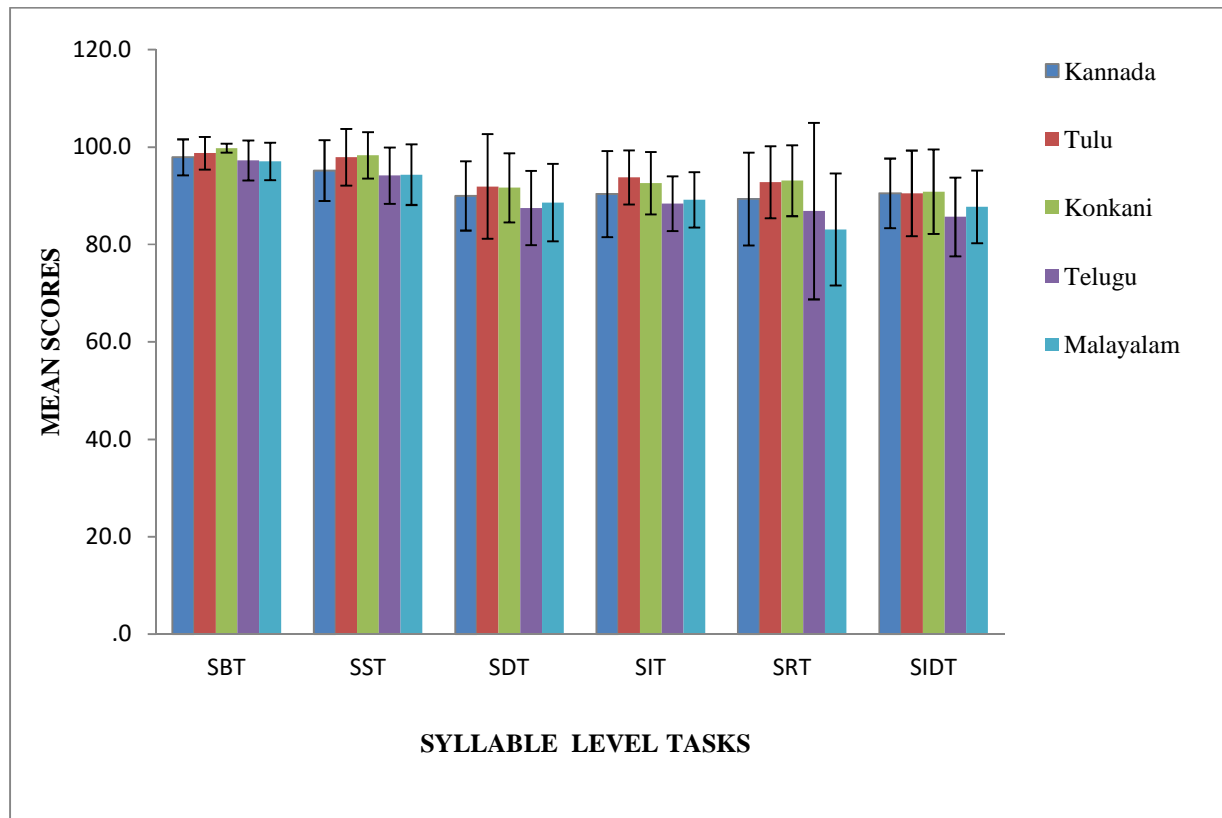
The current study aimed to investigate the effect of native languages (L1) on phonological awareness assessed in English (L2) among typically developing children studying in English medium of instructions within the age range of 8.6 to 9.7 years. The study groups were compared across all the phonological awareness and the results are discussed under each level of phonological awareness.

Syllable awareness

The syllable awareness skills were assessed using syllable blending, segmentation, deletion, identification, reversals and syllable identity tasks. The performance on each tasks were summarized in terms of mean and standard deviation for all the five Groups in figure 1. The descriptive statistics indicated variable performance between all the groups on all the tasks. In order to check the effect of native language, the mean percentage scores for individual tasks were compared across the groups using one-way ANOVA. The results revealed that, there was no significant difference between the groups for syllable blending [$F(4,95)=2.16, p=0.07$]; syllable deletion [$F(4, 95)=1.09, p=0.36$]; syllable segmentation [$F(4,95)=2.34, p=0.78$]; and syllable identity [$F(4, 95)=1.58, p=0.18$]. However, mean comparison for syllable reversal [$F(4, 95) =2.68, p=0.03$] and syllable identification [$F(4, 95) =2.41, p=0.05$] tasks revealed significant difference between the groups. Further post-hoc Bonferroni pair-wise comparison revealed there

was no statistically significant difference ($p>0.05$) between the groups indicating that the performance on syllable awareness tasks was similar across the language groups.

Figure 1



Mean scores and SD for five Groups on syllable level task

Note: SBT (Syllable blending task), SST (syllable segmentation task); SDT (Syllable deletion task); SIT (Syllable identification task); SRT (Syllable reversal task); SIDT (Syllable identity task)

The results revealed that, there was no significant difference between the groups for syllable blending, syllable deletion, syllable segmentation, and syllable identity. However, mean comparison for syllable reversal and syllable identification tasks revealed statistically significant difference between all the groups. Amongst all the tasks, syllable reversal and syllable identifications seemed to be more difficult task, because all the groups performed poorer than other tasks. Additionally, the results also revealed that, the effect of complexity in the tasks remained same across all the groups. This indicates that, all the groups performed similarly

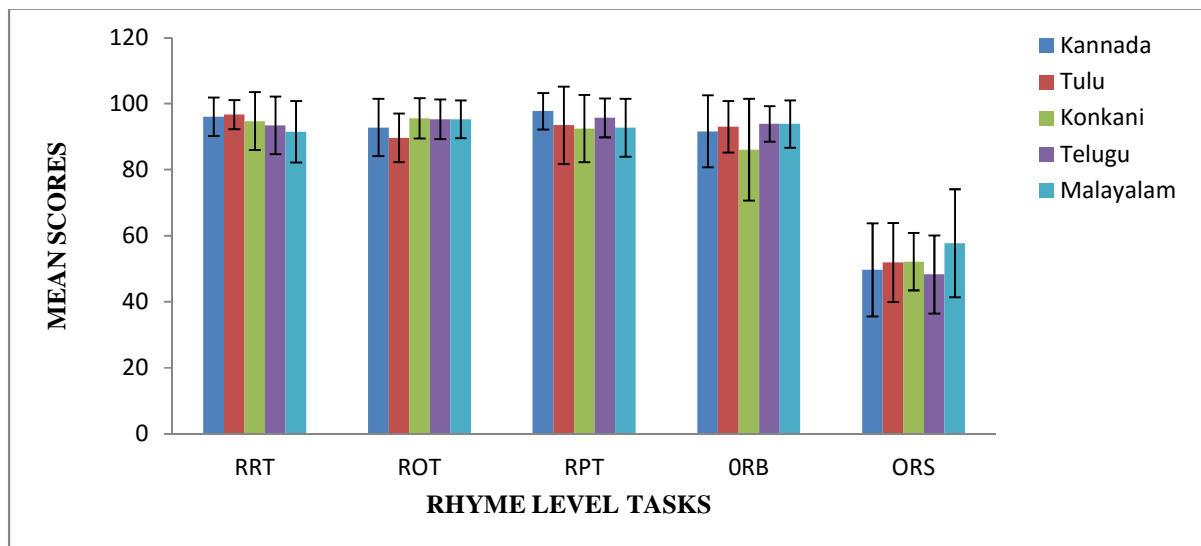
irrespective of complexity of the tasks. However, subsequent Bonferroni adjustment for pair-wise comparison revealed no significant difference between the groups for all the tasks indicating that all the children in the different native language groups performed similar across all the tasks. Thus the results suggested that, there was no effect of native language on syllable awareness. The possible explanation for these results would be, all native languages of the study groups belong to same linguistic family of Dravidian languages, except Konkani which belongs to Indo-Aryan language family and has no specific script. The Dravidian languages employ alphasyllabary writing system whereas English employs alphabetical writing system. Syllable awareness is crucial for children learning to read alphasyllabary orthography (Nag & Snowling, 2012), whereas phonemic awareness is important in reading alphabetical orthography (Muter, Hulme, Snowling, & Stevenson, 2004). Thus all the children who are exposed to Dravidian languages would have developed sufficient syllable awareness to represent the native phonology with that of orthography in the respective languages. Hence the performance in English remained same across all the language groups and tasks. In the current study in almost all the groups, children obtained greater than 85% scores in almost all the tasks. The current findings are in agreement with those obtained by Prakash, Rekha, Nigam, and Karanth (1993) who reported that, all the children from first, second and third grade had developed 80% of syllable deletion skills. Additionally, Prema (1997) reported that typically developing children approximate the maximum scores in syllable stripping by grade 3 (8 years of age).

Almost all the children in the present study were also exposed to Indian writing systems, alphasyllabary at school as one subject. Thus the children had already developed required syllable awareness skills which would have enabled them to decode at least one language with alphasyllabary writing system taught in school. However, the Konkani Group failed to show any effect that may be due to the alphasyllabary writing exposure which demands the sufficient level of syllable awareness. There is no script specifically for Konkani and the Devanagari has been used to represent the phonemes in Konkani in written form. The researchers have tried exploring the cross-linguistic transfer of phonological awareness in children learning to read English as a second language. However, this transfer depends on the degree of similarity between native and second language phonology and orthography (Geva & Wade-Woolley, 1998; Wade-Woolley & Geva, 1999). In the present study, both the writing systems in which the children were exposed were relatively different, hence, that may be the possible reason that, children were able to perform in similar fashion across the groups in syllable awareness assessed in English language.

Rhyme awareness

The rhyme awareness skills were assessed using rhyme recognition, oddity, production, onset-rime awareness and onset rime segmentation. The performance on each tasks were summarized in terms of mean and standard deviation for all the five groups as indicated in figure 2.

Figure.2



Mean score and SD for all the five groups on Rhyme level tasks

Note: RRT (Rhyme recognition task); ROT (Rhyme oddity task); RPT (Rhyme production task); ORB (Onset rime blending); ORS (Onset rime segmentation)

The mean comparison using One-way ANOVA revealed that, there was a statistically significant difference between the Groups for rhyme oddity task [$F(4, 95) = 2.731, p=0.03$]. Other tasks such as of rhyme recognition [$F(4, 95)=1.494, p=0.21$], rhyme production task [$F(4,95)=1.314, p=0.27$], onset rhyme blending [$F(4,95)=2.136, p=0.08$], and onset rime segmentation [$F(4,95)=1.573, p=0.18$] had no significant difference between the groups with the $p>0.05$. Subsequent post-hoc Bonferroni pair-wise multiple comparisons revealed no statistically significant difference ($p>0.05$) between the groups. The children from all the language groups performed better on all the tasks, however the performance in onset-rime segmentation was significantly poorer than the other task, and consistent across all the group.

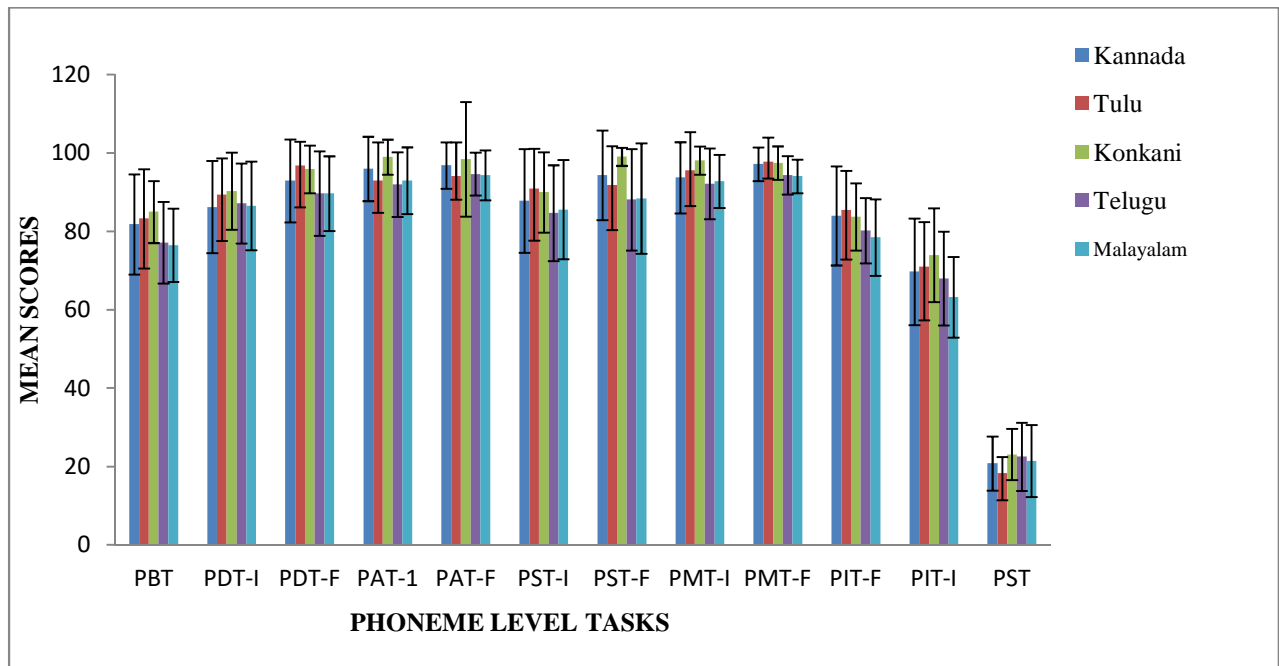
The mean percentage score comparison between all the groups across different task revealed that, there was a statistical significant difference between the groups only for rhyme oddity task. The performance on other tasks such as of rhyme recognition, rhyme production task, onset rhyme blending, and onset rime segmentation had showed no statistical significant difference between the groups. However, the subsequent post-hoc Bonferroni pair-wise multiple comparisons

revealed there was no statistically significant difference between the groups indicating all the groups with different native languages performed similar across all the rhyme awareness task assessed in English. The result indicates that, irrespective of native language, the performance on rhyme awareness assessed in English was similar. The results of the current study are partially consistent with the results obtained by Prema (2006) who reported that, the phonological awareness skills in mono-literate Kannada children having different native languages such as Kannada, Telugu, Tamil & Malayalam languages had no statistically significant difference between Tamil-Kannada, Telugu-Kannada and Kannada-Kannada Groups. However, there was significant difference seen among Malayalam-Kannada Group only. This result indicates that, there is minimal effect of native language on Kannada which also belongs to alphasyllabary family. However, they attributed the variation in the performance to subtle difference seen in the language structures. Additionally, the results also revealed that, the effect of complexity in the tasks remained same across all the groups. This indicates that, all the groups performed similarly irrespective of the complexity of the tasks. Except, onset-rhyme segmentation, all the Groups approximated the maximum scores. These results are consistent with Prema (1997) who reported that, rhyme awareness skills would develop completely by the age of 8 years. However, the specific onset-rhyme awareness skills would continue to develop beyond 8 years of age.

Phonemic awareness The phonemic awareness skills were assessed using Phoneme blending, Phoneme deletion (Initial), Phoneme deletion (final), Phoneme addition (initial), Phoneme addition (final), Phoneme substitution (Initial), Phoneme substitution (final), Phoneme matching (Initial), Phoneme matching (final), Phoneme isolation (final), Phoneme isolation (initial), and Phoneme segmentation. The performance on each tasks were summarized in terms of mean and standard deviation for all the five groups in figure 3.

One-way ANOVA revealed that, all the groups performed significantly different from each other on phoneme blending [$F(4,95)=2.455$, $p=0.05$], phoneme addition (initial) [$F(4,95)=2.563$, $p=0.04$], phoneme deletion (final) [$F(4,95)=2.810$, $p=0.03$] and phoneme matching (final) [$F(4,95)=2.806$, $p=0.03$]. However, there was no significant difference between the groups in the performance on phoneme deletion (initial) [$F(4,95)=0.586$, $p=0.67$], phoneme addition (final) [$F(4,95)=0.908$, $p=0.46$], phoneme substitution (initial) [$F(4,95)=1.047$, $p=0.38$], phoneme substitution (final) [$F(4,95)=3.42$, $p=0.12$], phoneme matching (Initial) [$F(4,95)=1.821$, $p=0.13$], phoneme isolation (final) [$F(4,95)=1.701$, $p=0.15$], and phoneme isolation (initial) [$F(4,95)=2.237$, $p=0.07$]. The bar chart indicates mean percentage scores for phoneme segmentation task being significantly poorer than other tasks and consistent across all the languages.

Figure: 3



Mean scores and SD for all the five groups on Phoneme level tasks

Note: PBT (Phoneme blending task); PDT-I (Phoneme deletion task-Initial); PDT-F (Phoneme deletion task –final); PAT-I (Phoneme addition task-Initial); PAT-F (Phoneme addition task-Final); PST-I (Phoneme substitution task-Initial); PST-F (Phoneme substitution task-final); PMT-I (Phoneme matching task-Initial); PMT-F (Phoneme matching task-Final); PIT-F (Phoneme isolation task –Final); PIT-I (Phoneme isolation task-Initial); PST (phoneme segmentation task).

Subsequently post-hoc Bonferroni test was administered for multiple comparisons to check significant difference between the groups. The post-hoc multiple comparisons revealed that there was no significant difference with ($p > 0.05$) observed between the groups. Amongst all the tasks in phonemic awareness, phoneme segmentation was found to be more complex task for all the groups, with consistently poor scores. Phoneme manipulation tasks were found to be easier when compared to blending and segmentation tasks. Children would continue to acquire phoneme segmentation beyond 8 years in English as a second language. In contrast, Liberman, Shankweiler, Fischer & Carter, (1974) investigated monolingual English speaking children's the ability to segment number of phoneme in a word, in first grade and grade two, and found that phoneme segmentation ability was easier for children from grade 1. However, Gibson and Levin (1972) showed that segmentation into phonemes will be quite difficult for children when

compared to segmentation into syllables in English native speaking children. It might be the reason that young children show difficulty in segmenting the phonemes. The results of the current study support these findings, where children performed better on syllable segmentation than phoneme segmentation. This is due to the alphasyllabary exposure to the child from childhood. Most often children in India learn English as a second language only after formal schooling begins and become sequential bilinguals. Overall, the results of phoneme awareness indicate no effect of native languages on phonological awareness assessed in English.

Conclusion

The results of the current study indicated that, there was no significant difference between the groups on mean percentage scores for phonological awareness at syllable level, rhyme level and phoneme level. This shows that, all the groups performed similar across the phonological awareness tasks, thereby indicating phonological awareness skills in English as a second language are independent of native language the children are exposed to. Hence it can be concluded that, the phonological awareness skills development in English seems to be same in children with Kannada, Tulu, Konkani, Telugu, and Malayalam native language. Thus it can be implied that, there is no effect of Dravidian languages (Kannada, Tulu, Malayalam & Telugu) and a Indo-Aryan language (Konkani) with alphasyllabary writing system on phonological awareness in children learning to read English as a second language. Additionally, if there is a facilitation of alphasyllabary native languages on phonological awareness skills assessed in alphabetical language it is expected to be similar across all the alphasyllabary languages reported in the study.

Implications

The discussions from the present study helps to understand whether the children from various linguistic background learning English as a second language will have additional benefit from the native language in developing phonological awareness skills in English. Since the current findings indicated no additional benefits due to equivalent performance across all the linguistic groups, the need for developing language specific normative data does not arise. It also allows the researchers to not consider native language as a potential factor affecting the phonological awareness skills in English, because all the languages belongs to same writing system i.e., alphasyllabary.

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Appendix

Home language (Native language) assessment questionnaire

Name of the child:

Age /Gender/Mother tongue:

What are the other languages spoken at home? Please tick on the languages listed below.

Kannada/English/Tulu/Telugu/Malayalam/Konkani/others specify

Instructions: This questionnaire aims to determine the language which you use predominantly at home. Hence, please read the questions carefully and rate the use of language using the following rating scale.

a). 4- Always b). 3- Most of the time c). 2- Sometimes c). 1- Rarely d). 0-Never

Sl. No	Questions	Ratings
1	Do you speak to your child in your mother tongue?	
2	Does others in the family speak to your child in your mother tongue?	
3	How often your child prefers to speak to the family members in your mother tongue?	
4	Do you feel the child understands better when you speak to him in the mother tongue than any other language?	
5	Does your child able to express his thoughts better in your mother tongue than any other language?	
6	How often you prefer to use the mother tongue while conversing within your family members?	
7	Do you insist the child to speak in mother tongue instead of any other language?	
8	Does your child converse in your mother tongue with his friends and neighbours?	
9	Was the child exposed to mother tongue since childhood?	
10	Does your child uses the mother tongue when he is asked to explain something?	