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RESEARCH ARTICLE

SHALLOW STAGE OF PHONOLOGICAL SENSITIVITY IN TAMIL SPEAKING CHILDREN

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ABSTRACT

Background: Phonological sensitivity skills develop as a continuum in a hierarchical pattern from shallow to deep stages. This is an important component in a child's literacy development, especially in spelling and reading performance. Shallow stages of phonological sensitivity skills set the stage for future proficiency in literacy. Development of phonological sensitivity skills must be studied in various languages as the age at which each stage is acquired can be variable depending on the uniqueness and complexity of the language. **Aim of the study:** The present study aimed to investigate the shallow stage of phonological sensitivity skill in typically developing Tamil speaking children. **Material and methods:** Two sub skills - Concept of Spoken Words (CSW) and Rhyming - Non-Rhyming (R & NR) skills were chosen in shallow stage of phonological sensitivity skills. To assess these, 210 children between the age ranges of 4-9.11yrs were studied. They were divided into three groups based on the grade in which they were studying. Each group had 70 children, out of which 35 were boys and 35 were girls. Test Tokens – Sentences to assess CSW and Word pairs to assess R &NR were prepared in Tamil. Familiarity and order of difficulty were considered while constructing the same. Pilot study was carried out. Later, the tokens were administered on the subjects. The raw scores obtained were computed and subjected to statistical analysis. Qualitative analysis was done to determine the frequency and the percentage of responses across each age group and also the performance difference between boys and girls were seen. **Results:** It could be observed that both Concept of Spoken Word (CSW) and Rhyming and Non-Rhyming (R&NR) skills were achieved only 61.7% and 66.7% respectively in Group I but there was a significant improvement in scores for group II and the scores reached a plateau for Group III. Pearson's chi square value did not show any significant difference across gender, whereas the difference among overall groups irrespective of gender was statistically significant with a value of 0.00. **Conclusion:** It could be concluded that typically developing Tamil speaking children develop the shallow stages of phonological sensitivity at around 4 years of age and masters around 7.11 years. This study helps understand the normal development of PSS, to identify children at risk for reading difficulties, to plan assessment and treatment protocols.

INTRODUCTION

Even before a child begins to speak, the child is already communicating with his world around through various means such as crying or by using gestures to draw attention. Similarly, even before the child learns to read or write, the child already embark on the path to literacy. Phonological sensitivity skills have been identified as an important component in a child's overall literacy development. Phonological sensitivity skill includes not only hearing different sounds but also the ability of being able to manipulate sounds in words.

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These skills develop in a predictable progression. This is important as it provides the basis for planning teaching tasks from easy to more difficult for children with language learning difficulties. Every child develops early or shallow stages of phonological sensitivity skills without any explicit training but later processes must be explicitly taught. Word awareness or the concept of spoken word is the ability to track the words in sentences. This semantic language skill is not a direct predictive of reading performance unlike the higher order skills. Also, it is less important to teach directly (Gillon, 2004) [5]. Rhyming is another early phonological sensitivity (listening) skill that children use to distinguish units of speech. Rhymes are those words that have similar ending sound, not necessarily same spelling. Understanding the concept of rhyming requires a child to know which part of the word is important to rhyme. Children who do not have a good ability to understand rhyme may often focus on initial/ final sounds or meaning of the word rather than the entire rime itself

Recognizing rhyme is crucial to reading development. Paulson in 2004 observed that the production of rhymes was more difficult for 5 year old children than commonly assumed, as only 61% could say a rhyming word for the stimulus presented [8]. Although some children may pick up these skills with relative ease during the kindergarten years (especially if the curriculum includes explicit activities) other students must be taught these meta-linguistic skills directly and systematically. Adams *et al* (1998) reported that the strongest predictor of future reading success in a child is the level of phonological awareness acquired at the end of kindergarten. They also reported that around 8–10% of children exhibited significant delay whereas more than 20% of children struggled with some aspects of phonological awareness [2]. Hence early identification and intervention is crucial and can make a real difference to children with limited levels of phonological awareness. The predictable pattern of phonological sensitivity skills development is more or less similar across languages progressing from larger to smaller units. Prominence and intricacy of onsets in language may influence the development of onset and phoneme awareness. There are many studies on the development of phonological sensitivity skills across various languages but no studies have explored the shallow stages of phonological sensitivity in South Indian Dravidian language, Tamil.

MATERIALS AND METHODS

To study the shallow stages of phonological sensitivity skills in typically developing Tamil speaking children, the following method was followed.

Candidacy Criteria:

The candidates for this study were selected based on the following criteria.

- Native Tamil speaker.
- Children from lower kindergarten to grade IV
- Normal with respect to hearing and no other significant medical or psychological history.
- No family history of reading disability.
- No history of educational backwardness.

Total Subjects: Children between the age ranges of 4 to 9.11 years were chosen for the study. They were classified into three groups according to their respective educational grades. Group - I is of children between 4 to 5.11 years (Lower and Upper Kindergarten), Group - II is of children between 6 to 7.11 years (I and II Grades), Group - III is of children between 8 to 9.11 years (III and IV Grades). Each group consisted of 70 children out of which 35 were boys and 35 were girls. Hence, a total of 210 subjects were considered for the study.

Test Tool:

i. **Selection of Sub skills:** Two major sub skills in the early phonological awareness continuum - Concept of Spoken Word (CSW) and Rhyming - Non - Rhyming Skills (R & NR) were chosen. These sub skills were selected based on the established literature on the development of phonological sensitivity skills in various languages.

ii. **Test Items:** Tokens were prepared in Tamil to assess each sub skill.

- **Concept of Spoken Word (CSW):** For CSW, the sentences were selected in Tamil based on the familiarity and those occurring in their school text books. Three sets of sentences, increasing in the order of difficulty were selected i.e., sentences having two (item no.1 and 4), three (item no. 2, 3, 5, and 8) and four words (item no. 6, 7 and 9) respectively. These sentences were randomly arranged.
- **Rhyming - Non-Rhyming (R & NR):** For R & NR, word pairs were selected in Tamil following similar criteria as that of CSW, having order of difficulty ranging from simple to complex but were randomly arranged. A Linguist's opinion was taken after the construction of tokens and the suggestions were incorporated.

Pilot Study: 45 subjects were randomly selected, with fifteen children in each group. Both subtest had 14 test items each. On obtaining the results, inappropriate or ambiguous test items were removed. Final sample had 9 tokens each (Total 18 tokens) in both sub skill tasks. The results obtained in the pilot study after edition was statistically analyzed with Pearson's Chi Square test and the "p" value of 0.000 was obtained which shows high significance across the groups.

Administration Procedure

- **Concept of Spoken Words (CSW):** Sentences were presented to the subjects orally and were asked to count the words in the sentence and answer verbally to the tester. For younger children, trial tokens were presented for better understanding of the task.
- **Example –** for the token, /ɪrʌvɪl̪ vɑ:ɳɪl̪ ɳɪl̪ɑ: θoɳɖɾʊmʃ/, the expected response is 4.
- **Rhyming and Non – Rhyming (R & NR):** 9 pairs of words were presented orally and the subjects were asked to say or identify whether the presented pair of words was a rhyming or a non-rhyming sequence. Trial tokens were used for demonstration.
- **Example –** for the pair of words /ɑ:ɖʊ - ŋɑ:ɖʊ/, the expected response is "yes"

Scoring: Each sub skill assessment contains 9 items; hence a maximum score of 9 each and an overall total of 18 could be obtained. Each correct response is marked as 1 and the incorrect response as 0. Total scores obtained in both sub skill were converted into percentage. Based on the percentage obtained, the performance level of each child can be classified from 90 to 100 as "achieved", 70 to 89 as "Partially achieved" and below 70 is "yet to be achieved".

Data collection: The study was carried out in various schools in and around Vellore, Tamil Nadu. The selection criteria were strictly followed for selecting each child for the study. After establishing good rapport, children were assessed in a quiet room. Video recording of the performance during token administration was done randomly for about 10 children in each group (a total of 30) to perform inter - tester reliability test later. The raw scores obtained for each child were computed and subjected to qualitative and quantitative statistical analysis

RESULTS AND DISCUSSION

The test tokens prepared to assess the shallow or early phonological sensitivity skills was administered on 210 typically developing Tamil speaking children studying from grade I to IV. The subjects were grouped into three categories according to the age. The mean ages for these groups are tabulated below.

Table 1. Categorization of the Subjects into Groups Based on the Age in years with their Respective Mean Age

S.No	Groups	Age in years	Mean age
1.	I	4 - 5.11	4.10
2.	II	6 - 7.11	7.01
3.	III	8 - 9.11	8.09

The raw scores obtained were computed and subjected to statistical analysis. Qualitative analysis was done to determine the frequency and the percentage of responses across each age group and also the performance difference between boys and girls. SPSS 14.0 version was used for the same. Chi-square and Fisher exact test was also done. 'p' value of less than 0.05 was considered statistically significant. Quantitative analysis was done for the data. Mean, Standard Deviation by using ANOVA and 't' test with the 'p' value significant mean difference being 0.05. The results obtained are as follows:

Sub Skill 1: Concept of Spoken Words (CSW): On comparing the performance of the three groups, group I performed significantly lower compared to the other 2 groups i.e., only 61.7% (with the mean score of 8.44) of the total children achieved this subtest, whereas 93.3% (with the mean score of 8.53) by group II and 100% achievement was seen in group III . The Pearson's chi- square value across groups was 0.00, which is highly significant. No significant difference in the performance between boys and girls were observed.

Table 2. CSW- Percentage Value for Performance Classification, Mean and Standard Deviation across Each Group

Concept of Spoken Words	I (4-5.11 yrs)	II (6-7.11 yrs)	III (8-9.11 yrs)
Qualitative analysis			
Achieved	61.7%	93.3%	100%
Partially achieved	35%	6.7%	0%
Yet to be achieved	3.3%	0%	0%
Quantitative analysis			
Mean	8.44	8.53	9.0
Standard Deviation	0.791	0.252	0.00

Group I performed better in tasks that involved least difficulty but when the complexity of the token increased i.e., when the mean length of the sentence was 4, they had difficulty to identify. It could be concluded that the concept of spoken word is still emerging in group I and completely achieved by group II, III.

Adam (1990) and Anthony (2003) reported that the concept of segmenting a word from a sentence should be achieved at the level of kindergarten [1, 3].This finding is in contrast to the present study since the concept of spoken word is still emerging in typically developing Tamil speaking children at kindergarten. Researches do conclude that by the end of kindergarten, sufficient instruction, practice and exposure to many literacy activities, children should be able to recognize how many words are in a sentence.

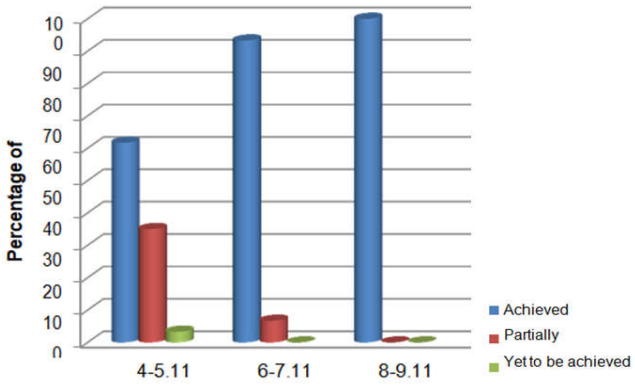

Figure 1. Percentage of Scores Obtained for Each Group in Sub Skill 1 - Concept of Spoken Word

Performance of group II and above strongly indicate that the concept of spoken words improve with exposure to literacy activities.

Sub Skill 2: Rhyming and Non - Rhyming (R & NR): In this sub skill assessment, pairs of words were presented and the task was to identify whether the words presented rhyme or not. Similar to the performance of sub skill I, group I performed least followed group II and group III respectively. Group I obtained only 66.7% with the mean being 8.48. Whereas, group II obtained 86.6%, with 8.78 being the mean

Table 3. R & NR - Percentage Value for Performance Classification, Mean and Standard Deviation across Each Group

Rhyming and Non – Rhyming	I (4-5.11 yrs)	II (6-7.11 yrs)	III (8-9.11 yrs)
Qualitative analysis			
Achieved	66.7%	86.7%	100%
Partially achieved	28.3%	10%	0%
Yet to be achieved	5%	3.3%	0%
Quantitative analysis			
Mean	8.48	8.78	9.0
Standard deviation	0.834	0.691	0.00

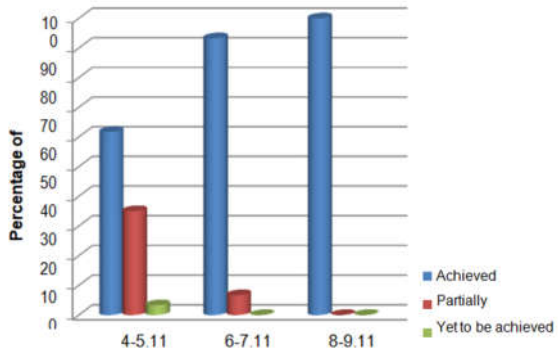

Figure 2. Percentage of Scores Obtained for Each Group in the Sub Skill 2 - Rhyming and Non-Rhyming.

Pearson's chi square value did not show any significant difference across gender, whereas the difference among overall groups irrespective of gender was statistically significant with a value of 0.00. Most of the incorrect response was for item number 8 i.e. (/pʌ[]ʌɱ - pɪ[]ʌɪ/) for group I and group II as this

item does not have major difference in word structure compared to other non - rhyming items. Also, the next most frequently occurred incorrect response was for item number 9 i.e. (/kʌθɪrɪkkɑ:ɪ - vɛŋḍʌɪkkɑ:ɪ/), this can be attributed to the maximum complexity of this item. Observing the results obtained, there exist a consistent hierarchy of performance. Rhyming skill is emerging in 4 - 5.11 year olds whereas, 6 years and above achieved this concept. This finding is supported by various researchers. Colorado (2004) reported that one of the initial skills of phonological awareness is rhyme recognition [4]. Lane (2004) observed that rhyming and non-rhyming skills emerge at the level of kindergarten [6].Neilson (1998) reported that the concept of rhyming emerges by 5 years of age and mastered by the age of 6 [7] .This study is in high correlation with our results. According to him the ability to identify rhyming words and later on to produce words that rhyme are important steps towards literacy.

Table 4. R & NR - Performance Summary of Various Groups and Their Achieved Percentage Score, Mean and Standard Deviation

Sub Skills	Groups	Achieved percentage	Mean	SD scores
Concept of Spoken Words	I	61.7	8.47	0.791
	II	93.3	8.93	0.252
	III	100	9.0	0.000
Rhyming and Non Rhyming	I	66.7	8.50	0.834
	II	86.7	8.78	0.691
	III	100	9.0	0.000

To summarize the results obtained, for typically developing Tamil speaking children, the shallower phonological sensitivity skills are still emerging in Group I, but was mastered by Group II and reached a plateau for Group III.

Reliability of the Test: As mentioned before, 30 subjects were randomly selected, with ten subjects in each group were video recorded while performing the test. Video recorded samples thus obtained were scored for performance by another professional Speech - Language Pathologist (SLP). The results obtained were then compared with the results obtained by the first Speech -Language Pathologist. The raw scores of both the SLP's were subjected to statistical analysis. 'Kappa' test was done to measure the Inter-judge reliability. A highly significant value of '1' was obtained which indicates a perfect positive correlation

Conclusion

The purpose of this study was to investigate the early phonological sensitivity skills in typically developing Tamil speaking children. It could be concluded that the children between 4- 7.11 years achieve early phonological sensitivity skills. Concept of Spoken Word (CSW) achieves first compared to that of Rhyming – Non-Rhyming skills (R & NR). It could be observed that the children above 8 years had already mastered these skills. Even though many children enter Grade I with good knowledge of recognizing or creating rhymes, difficulty with such skills can indicate a generalized problem with phonological sensitivity skills.

Students who cannot recognize or generate rhyme are at risk for developing the skills he/she needs to be successful in using familiar word part for reading and spelling in future. Thus, it is important for professionals who work with young children to understand the developmental nature of early phonological awareness skills, so that they can make decisions about assessment, literacy instruction and remediation as suggested by Philips et al., in 2008 [9].

Implications:

This study provides information on the shallow phonological sensitivity skills development in typically developing Tamil speaking children between 4 to 9.11 years of age. This information helps a clinician to screen a child's performance according to his/her age, identifying children at risk for reading difficulties, assist in planning management programs and also to evaluate progress.

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