TEST OF READING READINESS IN TYPICALLY DEVELOPING ODIA SPEAKING CHILDREN (TORR-O)

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Abstract

The objective of the current study was to develop a screening tool in Odia for reading readiness in pre-primary children which was to be named as TORR-O. The subjects of the study were 248 children (135 boys; 113 girls) speaking Odia as mother tongue and studying in schools with Odia as medium of instruction. The study was conducted in 2 phases. Phase-I was Pilot Study, as a part of which TORR-O was constructed with 30 questions which were designed to assess skills like print identification, shape and color matching, visual discrimination, letter recognition, alliteration, rhyming, blending, deletion and segmentation through a series of picture pointing tasks. The test was then administered on 12 children between the ages of 3.5 to 4.5 years. Based upon the results obtained, appropriate modifications were made. In Phase II, the Main Study, the revised version of the test was then administered to 168children between 3.5 to 4.5 years from various Odia medium schools across the two districts of Orissa. Item analysis and analysis of correlation was done. Item analysis included computation of discriminative power (DP) and difficulty index (DI) of the test items. DP gave a measure of competence of the test material to discriminate between poor and good readers and DI indicated difficulty of the test items. It was found that 17 test items were within the DP range of 0.2 to 0.8 and 21 were within the DI range of 30 to 70%. ANOVA was done to arrive at a correlation between age of children and reading readiness skills which concluded that the above mentioned skills are age dependent. The test findings concluded that the TORR-O can be used to assess reading readiness in typically developing Odia speaking children between ages of 3.5 years to 4.5 years excluding the items out of the DI-DP range.

Keywords: *Early Reading Skills, Pre Reading Skills, Emergent Literacy, Dyslexia, Learning Disability*

Introduction

Oral language abilities & early literary experiences mark the basic foundation of literary development in children. "Emergent literacy"(van Kleeck, 1990; Sulzby & Teale, 1991) experiences are those in where in children develop ideas about written language and its use even before they actually start decoding prints.

Reading readiness refers to the skills in pre-reading period when children begin to acquire experiences essential for learning to read. Experiences such as understanding spoken vocabulary, auditory and visual discrimination, memory and retention skills, attention and favorable circumstances that facilitate mental and physical growth, help the child to be ready to read in due course of time.

Every child doesn't learn to read on his/her own. Children need stimulation, be it at home or outside. They need to be introduced to the world of print and letters. Reading is perceiving language by eye, hence, the first requirement of reading is that the child should be able to segregate the letter segments and identify them with accuracy and speed. But not all children master this level. Some are unable to meet the mark, both at the linguistic level and perceptual level and hence, exhibit difficulties in learning to read and write.

In the Indian scripts, reading is taught syllable by syllable as syllables are the subunits of words (Karanth, 1985). These subunits are called 'akshara' which consist of i) an independent vowel, ii) a consonant with inherent or attached diacritic vowel, or iii) two or three consonants plus a vowel forming a 'graphic syllable' (McCawley, 1997). Diacritics are used to change the form of the inherent vowel; they are attached to the vowels and can be placed above, below, before or after. Diacritics occurring before the beginning of a syllable indicate that vowels are written as independent letters and when consonants occur together, special conjunct symbols are used to denote the parts of each consonant symbol that are combined.

Phonological awareness develops as a function of the writing system and its characteristics of any language. In Indian languages the time between the appearance of different levels of awareness and time between the stages till mastery of the skills vary according upon the nature of the script.

In a series of studies on phonological awareness in adults and children (literate versus non-literate) in the Indian languages/scripts of Hindi and Kannada, Prakash and Rekha (1992), Prakash (2003) and Prema and Karanth (2003) observed that phonological awareness is not crucial to successful reading in those languages. It was seen

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that on rhyme recognition, syllable deletion, phoneme deletion and phoneme oddity tasks, children learning to read alpha syllabaries performed well in rhyme recognition and syllable deletion tasks but not in phoneme segmentation tasks.

Children who fail to achieve ability to learn to read and write have been grouped under the umbrella term "Learning Disability". Learning disability encompasses a wide range of developmental disorders, primarily, dyslexia, dysgraphia & dyscalculia. Children with dyslexia, i.e. disorder of reading, usually have developmental language impairment. These children though have normal intelligence, fail to acquire reading skills appropriate for their age. Perfetti (1985) stated that a child with dyslexia is one who is normal/ above at least in nonverbal Intelligent Quotient (I.Q), two years behind the reading achievement and with a reading disability that is not explainable primarily by social, economic, motivation, or emotional factors.

The United States National Joint Committee on Learning Disabilities (NJCLD) (1981) defined it as - a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction and may occur across life span. Problems in self regulatory behaviors, social perception and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences such as cultural differences, insufficient or inappropriate instruction, they are not the result of these conditions or influences.

Identification of children at risk of dyslexia can be done early by assessing pre-reading or reading readiness skills.

Several tests such as, Dyslexia Early Screening Test (Nicholson and Fawcett, 1996), and Get Ready to Read (Lonigan & Whitehurst, 2001) are available in Western context for assessment of the same. These tests help in early identification of dyslexia in children and also warn parents of children who are at risk of any form of reading disabilities. The tests help by giving the parent, teacher or therapist an overview of the child's skills and help in planning of appropriate intervention.

In India around 10 to 15 percent of all school children suffer from learning disability (Santhanam, Babu, Sugandhi, Rao, 2011). As reading abilities are language dependent, there is need for developing tests (screening and/or diagnostic) in various languages for assessing literary skills. Odia is one of the primary languages spoken in eastern India; with a population of 33 million speaking it. Odia is an alphabetic-syllabic type of phonetic orthography having invariant grapheme-phoneme conversion rules (Sahu & Kar, 1994).

There is dearth of research related to literary and language based disorders in Odia. The study aimed at developing a screening tool for reading readiness in pre-primary children in Odia.

Method

The test of reading readiness in Odia (TORR-O) was developed based upon the Get Ready to Read Test and the Malayalam Reading Readiness Test (Unpublished Master's Dissertation; Rajan, 2009). It consisted of 26 questions which assessed print identification skills, gross visual discrimination &fine visual discrimination skills, size discrimination, shape matching, color matching, and neatness and length judgments, followed letter recognition, alliteration rhyming, blending (at word and syllable level) and on deletion abilities.

The participants were 286 Odia speaking children between ages of 3.0 to 5.0 years, who were selected based upon the following inclusion and exclusion criteria:

Subject selection criteria-

- Subjects having Odia as their mother tongue.
- Subjects enrolled in anganwadi, balawadi, prarambha and/or bodha (preschool, montessory and lower and upper kindergarten)
- Subjects having satisfactory classroom performance
- Subjects whose parents were literates
- Subjects with no known sensory deficits
- Subjects with any other known speech-language and physical handicaps

Table 1: Distribution of population taken for the study

	School/district	No. of boys	No. of girls
School-1	Saraswati Shishu Vidya Mandir, Sector-9, Cuttack	25	15
School-2	Sishu Bharati high school, Cuttack	17	22
School-3	Saraswati Shishu Vidya Mandir, Sector-6, Cuttack	22	23
School-4	Saraswati Shishu Vidya Mandir, Banki, Cuttack	39	23
School-5	Shishu Mandir, Tulasipur, Khurda	26	26
School-6	Balawadi, Banki, Khurda	6	4

Table 2: Distribution of population across age groups

Age group (in years)	Frequency
3.0 to 3.5	30
3.5 to 4.0	84
4.0 to 4.5	84
4.5 to 5.0	30
Pilot study (3.5 to 4.5)	12
>5.0	3
Poor academic performers	5

The study was conducted in two phases.
Phase I: Pilot Study
Phase II: Main Study

Phase I: Pilot Study
Development of screening tool: This test of reading readiness in Odia (TORR-O) was developed based upon the Get Ready to Read Test and the Malayalam Reading Readiness Test. Initially the TORR-O was constructed with 28 questions which were designed to assess skills like print identification, shape and color matching, visual discrimination, letter recognition, alliteration, rhyming, blending, deletion and segmentation through a series of picture pointing tasks. The test was then modified due to difficulty in putting forth the question across children as young as 3.5 years; 2 questions to test segmentation ability at word and syllable level were dropped; and options in 3 questions were changed in color to facilitate optimum responses from children.

The test was administered on 12 children between the ages of 3.5 to 4.5 years. Based upon their responses appropriate modifications were made related to choice of pictures i.e. with regard to colors and iconicity.

Phase II: Main Study
The test was revised based upon responses obtained in pilot study. The Main Study consisted of 26 questions which assessed print identification skills, gross visual discrimination skill, size discrimination shape matching, color matching, the fine visual discrimination abilities and neatness and length judgments, followed letter recognition, alliteration skills, rhyming, blending and deletion. The revised version of the test was then administered to 168children between 3.5 to 4.5 years from various Odia medium schools across the two districts of Orissa.

Procedure: Before beginning the test, demographic data and information about performance in class, involvement in extra-curricular activities if any, parental education & habit of reading at home were collected. Inclusion criteria considered subjects having Oriya as their mother tongue, with hearing and visual sensitivity within normal limits and enrolled in anganwadi, balawadi, prarambha and/or bodha. The exclusion criteria omitted children with other known speech-language deficits and children whose parents were not literate.

The process of data collection spanned over a period of 1 month and covered 2 districts of Orissa (Cuttack and Khurda) and their urban (Cuttack) and rural (Banki, Tulsipur) population across 3 well-known Odia medium schools (Sishu Bharati, Sishu Mandira and Bal Bharati) and their sister concerns and 1 balawadi.

The instructions for the administration of the test were constructed in short and simple sentences. The instructions were predefined to be repeated only twice in itself and once with preset examples (for specific questions). Instructions to each child were to be given in Odia. The test administration time was approximately 15-20 minutes per child.

The test was also administered on 60 children (30 in each group) between the ages of 3.0 years to 3.5 years and 4.5 years to 5.0 years to check for any deviations in number of correct responses in the lower and upper age groups. The TORR-O was also administered to 3 children >5.0years and 5 students rated as underperformers or having difficulty in academics by their teachers. The collected data was analyzed using SPSS Statistics 17.0.2.

Results and Discussion

Appropriate statistical analysis was done in 2 domains.

1. *Domain 1: Item analysis:* It was done to find out strength and weakness of each test item.
   i) Difficulty Index (DI)
   ii) Discriminative Power (DP)

2. *Domain 2:* Analysis of Correlation: It was done to see the effect of age on reading readiness skills.

Domain 1: Item Analysis

A detailed item analysis was done to assess the effectiveness of each test item by analyzing the students' responses to it. The results of the item analysis focus on:

- If the item functions as intended, i.e. is the question capable to discriminate between children of high and low performances, and
- If the test items were appropriate in terms of difficulty.

The test questions were subjected to the following 2 analyses.

i) Discriminative Power (DP): An item's discriminative power is the capability to differentiate between children with high and low achievements. A small segment of 25% of high scores and 25% of low scores was used to identify the upper and lower groups. The sizes of the groups vary but here for the simplification of analysis, 25% of the total group is taken for the analysis.

For calculation of Discriminative Power, results of the target group, i.e. 168 children have been considered; it revealed that 17 test items fall within the DP range of 0.2 to 0.8. The items that did not meet the specified criteria were related to print identification, visual discrimination, color matching, neatness judgment, blending and deletion.

ii) *Difficulty Index (DI):* It determines if the items are too easy or too difficult. In part, it determines standard deviation of scores of the test items. The difficulty index of each item is 100%. If everyone obtains the same score, the standard deviation will be zero. Conversely, if everyone makes mistake with that particular item, then the standard deviation will be zero.

The TORR- O has 4 alternatives. Hence, one fourth (25%) of the children will get the correct answer by just hit and trial or guessing the options. Hence, it is difficult to find the DI of an item below 25%. The ideal DI range lies between 30 to 70%.

The discriminative power (DP) of the items should be between 0.2 and 0.8. It can be seen from table 4 that nine test items don't fall between the specified criteria. Those questions are not capable to differentiate between high and low performing children.

The analysis of difficulty index (DI) revealed that all but five of the test items lied between the DI of 30% to 70%. Those items were based upon phonological awareness skills. Hence, it can be concluded that the items are neither too easy nor too difficult.

Domain 2: Analysis of correlation

Analysis of variance was done to find out effect of ages on reading readiness skills. During the process it was observed that factors such as classroom performance, parental education, socio-economic status, family size, and region influenced readiness skills. Further, ANOVA was carried out to study the influence of above mentioned factors on pre-reading skills. For this purpose data obtained from 228 children was considered. Information obtained from pilot study (12 children), >5.0 years of age (3 children), and poor academic performers (5 children) were excluded. Due to impenetrability, information from each of the 228 children could not be obtained and results were computed based upon the available data.

Age and reading readiness

Analysis of effect of age on reading skills was done by comparing mean scores of children in each age group. The following table shows the results.

Table 3: Mean test scores across different age groups of children

	Age groups		
	3.0 to 3.5 years	3.5 to 4.5 years	4.5 to 5.0 years
Mean scores	40.94%	70.99%	93.97%
Standard deviation	12.18%	10.15%	5.68%

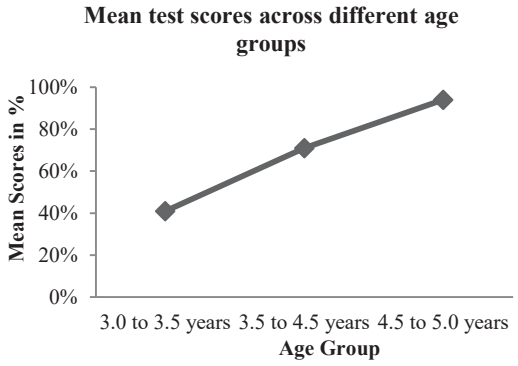

Figure 1: Mean test scores across different age groups of children.

It can be seen form the table that there is a difference between mean test scores across different age groups. Children below age of 3.5

years have poorer mean scores as compared to children between ages of 3.5 years and 4.5 years. While, children above the age of 4.5 years have higher mean test scores than the target group. The group, 3.0 to 3.5 years, has poor reading readiness skills. It was found that during the process of data collection, over half of the children could not complete the test. Some couldn't understand the questions, some pointed to multiple items while few others didn't attempt to answer. The results of this study are in accordance with results of Oliver (1975). He found that over half of 3 year olds and one third of four year olds interviewed said they knew how to read although they didn't know how to. Only a few five year old said they knew how to read, indicating a developmental progression with this concept. Most children develop reading readiness during ages of 4.5 to 6 years of age based upon school curriculum and training. Formal teaching takes place from first standard onwards, i.e. after the age of 5 years. The poor performances of 3.0 to 3.5 year olds can be attributed to lack of formal exposure to prints and books. To test for the significance of the score differences, ANOVA was applied; results are as shown in Table 4.

Table 4: Results of ANOVA for effect of age on reading readiness skills

	Sum of squares	Degrees of freedom	Mean square	F	Significance
Between groups	46727.074	2	15575.691	154.281	0.000
Within groups	22715.189	226	100.956		
Combined	69442.262	228			

ANOVA was calculated by taking The ANOVA results reveal that the differences in mean test scores across the age groups are significant with a 0.000 level of significance. It can be seen that with increase in age there is a significant increase in performance scores by the children. It can be concluded that age influences reading readiness skills. This is in accordance with studies done by Chall (1983) and Firth (1985), wherein, it was concluded that reading skills or phonological awareness skills show a developmental progression with age.

Also, a descriptive analysis of the test scores of children >5years of age was done. Following table shows their test scores.

Table 5: Results of children >5 years of age on TORR-O

Student Sl. no.	Score
1	26
2	25
3	26

The variation in mean scores, as depicted in table 3and table 5, is from 40.94%, to 70.99%, 93.97% and 98.71%. Hence, with increase in age, it is suggested that children acquired more complex reading skills than at a younger age

Conclusion

An attempt was made to develop a test of reading readiness for pre-primary children. The target population was typically developing Odia speaking children between ages of 3.5 to 4.5 years. 286 children were tested for their awareness of pre-reading skills like print awareness, book conventions, neatness judgments, color concept, visual discrimination, letter recognition and metaphonological skills, which were assessed through multiple choice pictorial representations of test items. Analysis of discriminative power (DP) and difficult index (DI) for each test item was done which revealed that 17 test items were within the DP range of 0.2 to 0.8 and 21 within the DI range of 30 to 70%. 17 test items fall within the DP range of 0.2 to 0.8 and 21 fall within the DI range of 30 to 70%.

9 test items of TORR-O do not satisfy the criteria for effectively discriminating good and poor readers, but, can be used as a screening tool for early identification of reading difficulties in pre-primary school children i.e. between the ages of 3.5 to 4.5 years.

Implications

- This test can be used to early identify children who are at risk of reading disability.
- Skills assessed can be targeted for intervention process.
- Test can be administered within 10 minutes.
- It doesn't require special training to administer the test. It can be administered by Speech Language pathologists, special educators, teachers and parents of children.

Limitations

- Care should have been taken to obtain complete information regarding parental education, socio-economic status and family sizes.
- Study was carried in only 2 districts of Orissa.
- Readiness skills in terms of gender variation were not studied.
- 9 test items don't fall within the range of Discriminative Power, hence are not effective enough in discriminating good and poor readers.

Future directions

- Aspects of auditory discrimination can be included.
- Test can be administered to a larger population across various districts.
- Test can be administered on a larger sample of poor achievers to find its reliability.
- Test can incorporate information reading habits of children at home.

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