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Phonological Awareness and Orthographic Skills -A Comparative Study between Typically Developing Vs Attention Deficit Hyperactivity Disorder Tamil Speaking Children

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Abstract

The present study aims in comparing typically developing vs attention deficit hyperactivity disorder (ADHD) Tamil speaking children in their Phonological awareness and orthographic skills. A standardized test tool on phonological awareness and orthographic principles (Akila & Prema, 2000) was administered, on 20 children out of which 10 typically developing & 10 ADHD children, (5 girls & 5 boys in each group), studying in grade III & grade IV from regular school. Both groups showed that the order of acquisition that is rhyming task was the earliest followed by syllable deletion, syllable oddity, syllable reversal, phoneme oddity and phoneme deletion. Both groups found phoneme tasks difficult than the syllable tasks.

Keywords: ADHD, Phonological awareness, Orthography.

Introduction

Reading is one of the most prominent features which separates human from other beings. In the recent years a lot of interest is shown in the literature on Learning Theories, including reading Acquisition, that emphasize the importance of the learners meta-cognition or the knowledge and control learners have over their thinking and learning activities. The phonology of a language is the sound system, the way sounds are put together to form meaningful unit that are intelligible to speakers. A large body of research indicates that phonological awareness is highly related to early reading ability (Blachman 1984); Wagner & Torgesen 1987). Studies have shown that children with poor phonological awareness have more difficulty in learning to read than do children with well developed phonological awareness (Bryant et al., 1989). It is argued that a lack of an awareness of the sound structure of language makes it particularly difficult to learn the correspondence between allophones, & speech sounds they represent (Jorm & Share, 1983).This, in turn can result in poorly developed decoding & word recognition skills.

Yet another element contributing to good reading ability is the orthographic skills which have been widely researched in the recent years. Orthographic skills are defined as the ability to visually analyze the structure of words. However the Indian orthographic system is quite different from English orthography. Tamil is an Indian Language which belongs to the Dravidian family of languages. Tamil is derived from the Brahmi script and is written in an alpha-syllabic form like other South Asian languages. Vowels have two forms-one used at the beginning of a word, another following consonant symbols. Tamil script does not have separate representations/symbols for voiced stops, voiceless aspirated and voiced aspirated stops and no representation/symbols for fricatives other than glottal and voiceless alveolar retroflex and dental sibilants, which are also borrowed from another script used for writing of Sanskrit words.

The relationship between orthography and phonological awareness that are considered as crucial for reading acquisition has been investigated in non-alphabetic scripts (Morais et.al., 1979; Karanth & Prakash, 1996). Phonological awareness which is considered as a reliable indicator of reading achievement in alphabetic orthography (deep orthography) was not found to be so crucial for shallow orthography such as syllabary (Rekha, 1993; Prema, 1997). In an another study (Prema,1997) it indicates that the high correlation of semantics with SHWA (writing) and negative correlation of phoneme deletion with writing further supports that the underlying skills used for learning to read kannada are different from that of writing. Whereas tests for phonological awareness in Tamil (Akila & Prema, 2000) found good correlation for rhyming, syllable oddity and syllable reversals with (SHWA-oral) suggesting that these are crucial factors for learning to read alpha-syllabic script, Tamil, which are different from that of kannada (alphabetic syllabary). Similarly, in Malayalam (Swaroopa & Prema, 2001) rhyming was

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found to be a potential task to identify 'at-risk' children for reading disability.

Gomez-Betancur, Pineda and Aguirre- Acevedo (2005) Analyzed the performance on phonological awareness tasks of 96 children aged 7 to 11years with ADHD combined type (ADHD/+H) and inattentive type (ADHD/-H) compared with one control group. The performances of the three groups on phonological awareness tasks, as auditory discrimination, visual recognition, sequential repetition, oral segmentation, syllable inversion, similar words reading and writing, and pseudo-words reading and writing, were compared. Results indicated that the differences between ADHD and control children on phonological awareness tasks scores were not found. Children with ADHD without LD performed similarly to controls on phonological awareness tasks. Jen and Hsiu-Lin (2007) investigated the relationship between phonological awareness and word recognition ability in English and Chinese of attention deficit hyperactive disorder (ADHD) students in Taiwan. Participants in the study consisted of thirty-four elementary school students between the ages of nine and twelve and in grades three to six. Six tasks, both in Chinese and English, were administered with phonological awareness subtests for Initial Sound Detection, Final Sound Detection, Rhyme Task, Phoneme Deletion, Real Word Recognition and Pseudoword Recognition. Findings revealed that ADHD students with more advanced phonological awareness skills in their native language (Chinese) performed significantly better in their foreign language (English). Moreover, ADHD children's phonological code and sound structure showed the inter-language variations between two languages that reflected some specific difficulties in pronunciation.

The Present study aims in comparing typically developing vs. ADHD Tamil speaking children in their Phonological awareness and orthographic skills. The specific aim of this study is to find the crucial factors for learning to read alpha-syllabic script. As there is no much published research about the acquisition of reading in Tamil, the present study would serve to enrich our theoretical knowledge from the perspective of Alpha-Syllabic script & also enrich the learning patterns of Typically Developing children with that of ADHD. Thus the study would contribute towards delineating therapeutic intervention procedures for children with ADHD.

Methodology

In order to compare the difference in typically developing vs. ADHD Tamil speaking children, a standardized test tool on phonological awareness & orthographic principles (Akila & Prema 2000) were administered, on 20 children out of which 10 typically developing & 10 ADHD children, (5 girls & 5 boys in each group), studying in grade III & grade IV from regular school. The study was carried out in Tamilnadu (Chennai), where majority of them are Tamil speakers. The children were selected on the basis of principle of randomization. The testing was conducted in the school premises in a quiet condition. Rapport was established with each subject prior to test administration. Testing was completed in a single session. The Average time taken for administration ranged from 30 minutes to 1 hour. Tangible reinforcement (sweets) was given to each subject after the completion of the test.

Criteria for Selection

The following are the criteria for selection of children:

1. Native speakers of Tamil Language.
2. Children studying in English medium, with second language as Tamil.
3. Children from Grade III & Grade IV.
4. Normal with respect to hearing, & intelligence.

Tests

Tests for phonological awareness

1. Rhyming –Non Rhyming
2. Phoneme oddity
3. Phoneme Deletion
4. Syllable Deletion
5. Syllable Reversal
6. Syllable oddity

With a maximum score of 12 for each test

Tests for sensitivity to orthographic principles

1. Through oral mode
2. Through written mode

With a maximum score of 16 for each mode

Results and Discussion

In order to investigate the relationship between phonological awareness & orthographic skills in typically developing vs. ADHD children.20 children studying in normal school (both category), were given Tests of phonological skills & orthographic skills. The raw data was subjected to statistical Analysis.

Test for phonological awareness

Rhyming & Non-rhyming: The mean scores for typically developing children on this particular task was 11.9 (SD=0.316) when compared to ADHD 11.7 (SD=0.940). Results indicated that, this test was performed equally well by both the groups.

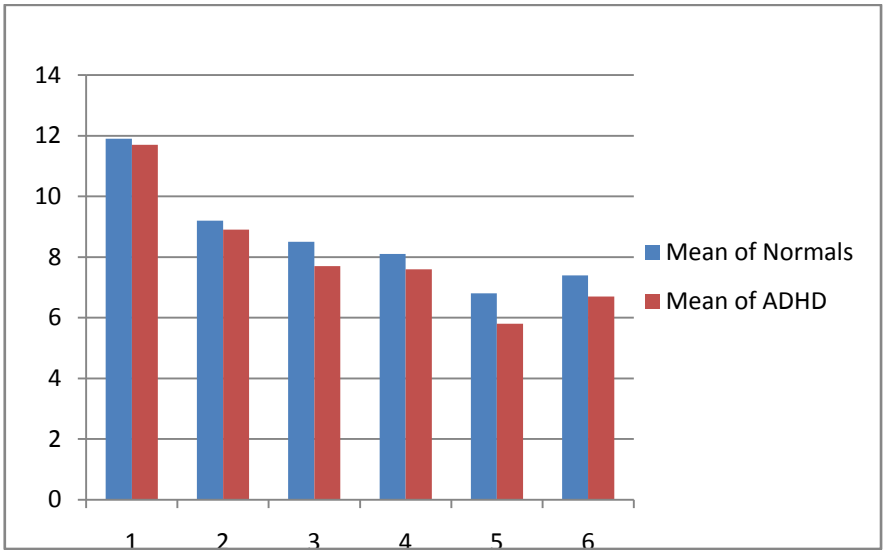

Figure I. Mean of Normals & ADHD Children on Phonological Awareness

Syllable Deletion: The mean scores for typically developing children was 9.2 (SD=1.61) against ADHD group 8.9 (SD=1.52), which indicates that this task was performed slightly better by typically developing children.

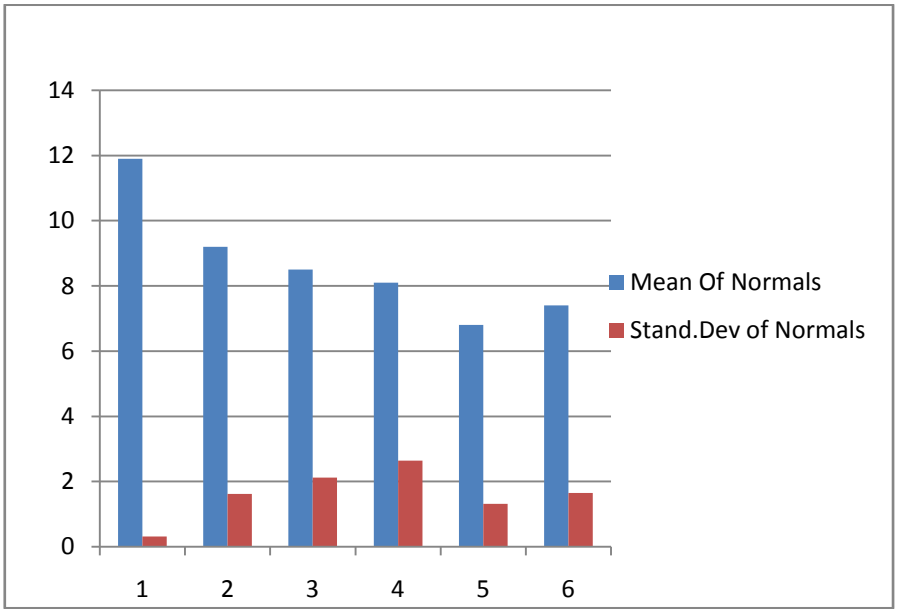

Figure II. Mean & Standard Deviation of Normals on Phonological Awareness tests

Syllable Oddity: The mean scores for typically developing children was 8.5 (SD=2.12), when compared to ADHD was 7.7(SD=1.41) which indicates typically developing children performed well than the ADHD group.

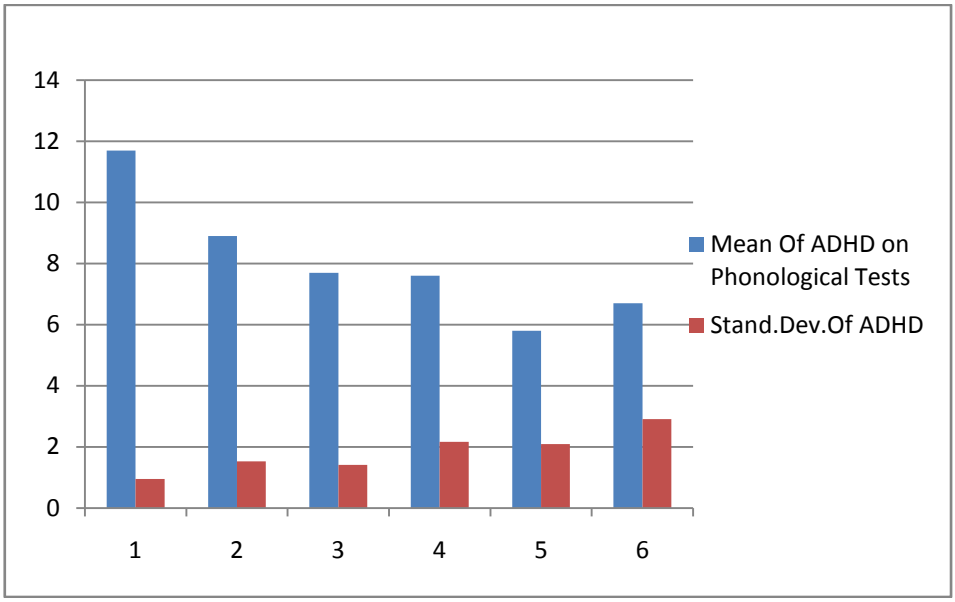

Figure III. Mean & SD of ADHD Children on Phonological Awareness Tests

Syllable Reversal: The mean scores for the typically developing children was 8.1 (SD= 2.64) and for the ADHD 7.6 (SD= 2.17), indicates that the typically developing children performed better than the ADHD.

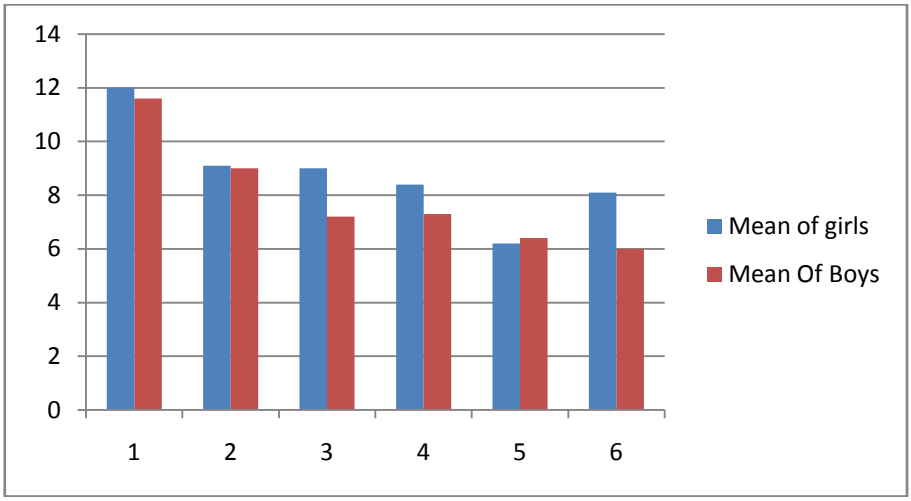

Figure IV. Mean of Girls & Boys of Typically Developing Children

Phoneme Deletion: The mean scores for typically developing children was 6.8 (SD=1.31) and for ADHD 5.8 (SD= 2.09), which shows typically developing children performed better.

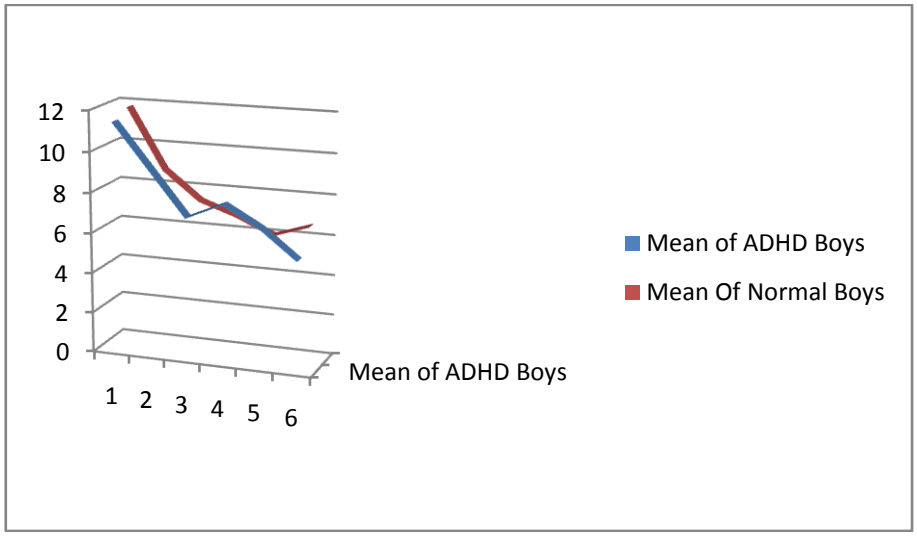

Figure V. Mean of ADHD vs Typically Developing Boys

Phoneme Oddity: The mean score for typically developing children 7.4 (SD= 1.64) and ADHD 6.7 (SD=2.90) and this higher variability shows that ADHD children performed poorly in this task.

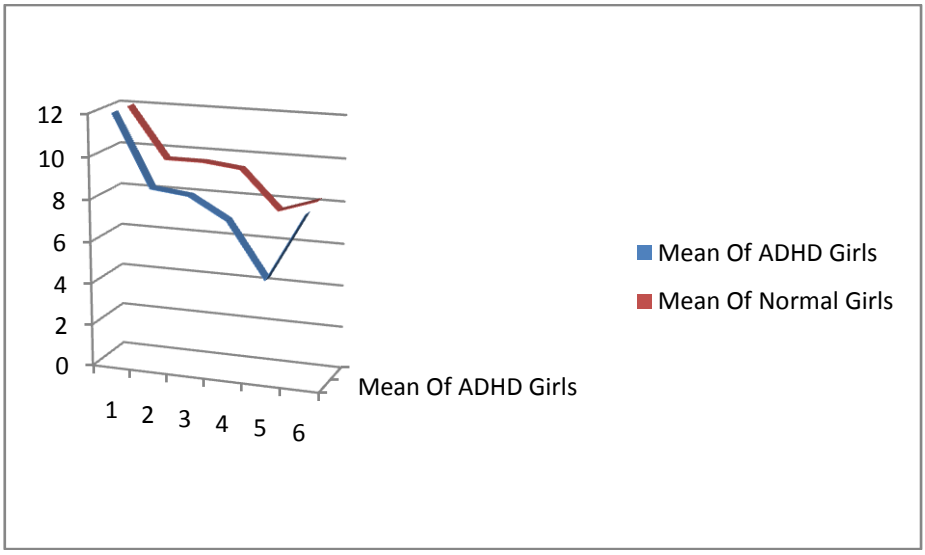

Figure VI. Mean Of ADHD vs Typically developing Girls

Of all the tests in both groups performed on Rhyming and Non-Rhyming task very well and phoneme deletion task both the groups performed poorly.

Orthographic principle

The mean scores for the typically developing children on this orthographic principle on oral mode was10, (SD=3.29), written mode was 11.9(SD=3.35). The mean scores for the ADHD children on orthographic principle oral mode was 8.8(SD=3.39), written mode 7.4(2.50), which indicates that the typically developing children performed better than the ADHD group. An interesting finding is that, the typically developing children performed better in the written mode than the oral mode.

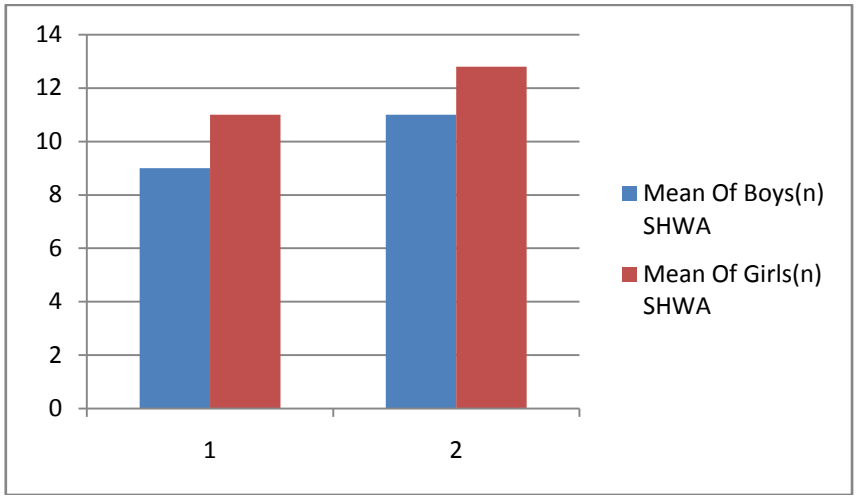

Figure VII. Mean of Typically Developing Girls & Boys on Orthographic Principles

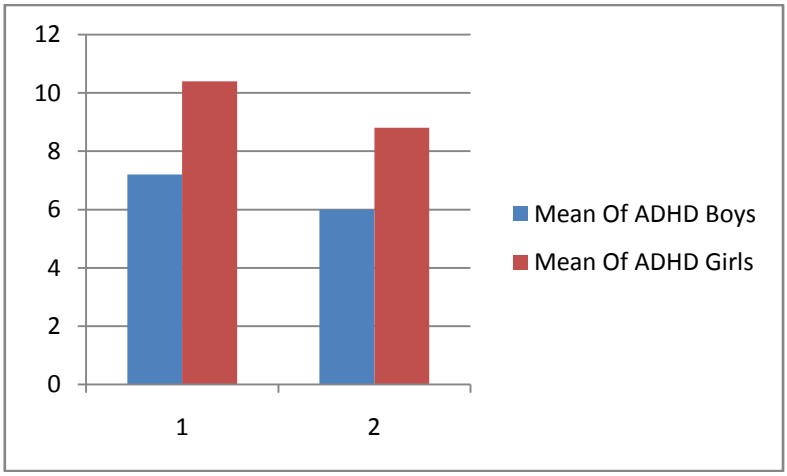

Figure VIII. Mean of ADHD Boys & Girls on orthographic skills

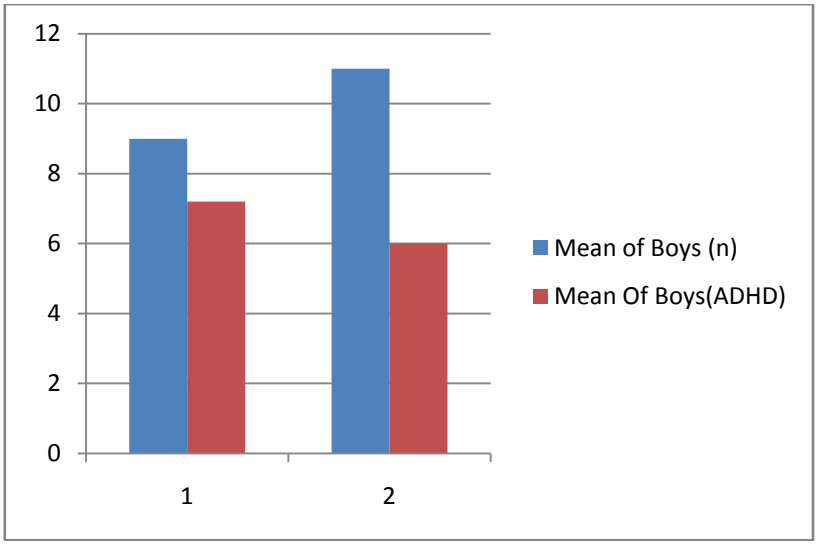

Figure IX. Mean of Boys (Typically Developing) & ADHD on orthographic skills

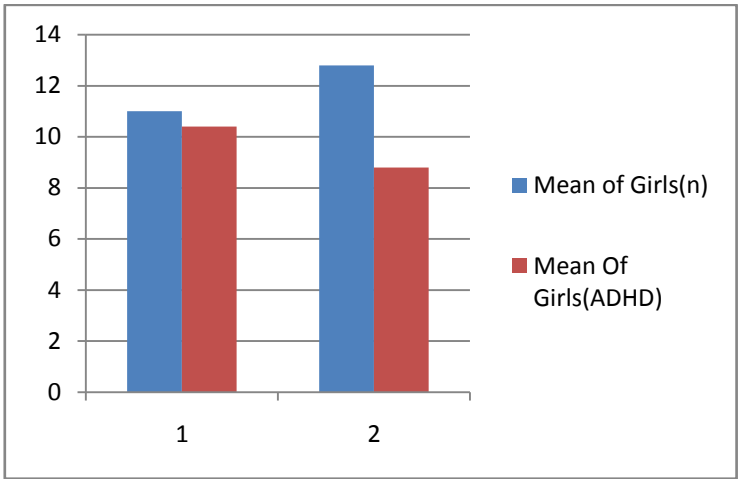

Figure X. Mean of Girls (Typically Developing) and ADHD on orthographic skills

Correlation Analysis

The performance on tests of Phonological Awareness & orthographic principles was further studied through the Karl Pearson's correlation Analysis. A two – tailed test to check the significance of correlation was employed and result indicates P=0.621, which shows that there is a significant difference between phonological awareness & orthographic skills performed by both the groups.

Table I. Phonological Awareness & orthographic principles was further studied through the Karl Pearson's correlation Analysis

x	y	x2	y2	xy		
10.33	16	106.7089	256	165.28		
10.66	15.5	113.6356	240.25	165.23		
10.33	8	106.7089	64	82.64		
6.66	8	44.3556	64	53.28		
9	12	81	144	108	sxx	27.94489
8	14	64	196	112	syy	198.2375
8	8	64	64	64	sxy	46.28225
8	8	64	64	64		
7.33	8	53.7289	64	58.64	p	0.621828
8.16	12	66.5856	144	97.92		
8.33	13	69.3889	169	108.29		
7.66	7.5	58.6756	56.25	57.45		
9.83	12	96.6289	144	117.96		
7.33	8	53.7289	64	58.64		
7.83	7.5	61.3089	56.25	58.725		
6	5	36	25	30		
7.83	7	61.3089	49	54.81		
8.5	7	72.25	49	59.5		
8.83	8	77.9689	64	70.64		
8.5	6	72.25	36	51		
167.11	190.5	1424.233	2012.75	1638.005		

Quantitative analysis for Phonological awareness Test & Orthographic Principles

A Percentage of Accuracy of Responses on phonological awareness tests was tabulated and the result indicates the following.

Table II. Percentage of Accuracy of Responses on Phonological Awareness Tests (ADHD)

	Subjects	Syllable Tests	Phoneme Tests
ADHD Group	1	66.66	58.33
	2	69.44	37.5
	3	80.55	75
	4	61.11	41.66
	5	61.11	54.16
	6	47.22	29.16
	7	72.22	50
	8	66.66	62.5
	9	77.77	54.16
	10	69.44	58.33
		67.218	52.08

Table III. Percentage of Accuracy of Responses on Phonological Awareness Tests (Normals)

	Subjects	Syllable Tests	Phoneme Tests
Typically Developing Children	1	88.88	75
	2	97.22	70.83
	3	91.66	70.83
	4	47.22	45.83
	5	72.22	66.66
	6	69.44	45.83
	7	61.11	58.33
	8	63.88	54.16
	9	55.55	50
	10	69.44	54.16
		71.662	59.163

Typically developing children performed better than the ADHD in phonological awareness and orthographic principles. Girls performed better than the Boys. The typically developing girls performed better than the ADHD girls. The typically developing boys performed better than the ADHD boys except in the phoneme deletion task where both the group performed equally. Typically developing girls performed well on SHWA than typically developing boys. Typically developing girls performed well than ADHD girls. Poor readers were identified in both the groups.

Conclusion

The aim of the study is to compare typically developing vs. ADHD Tamil speaking children in their Phonological awareness and orthographic skills. Both groups indicated that the order of acquisition that is rhyming, was the earliest followed by syllable deletion, syllable oddity, syllable reversal, phoneme oddity and phoneme deletion. Both groups found phoneme tasks difficult than the syllable tasks. This study is suggestive of the use of syllabic skills than phoneme skills while teaching children to read Tamil. Because only 20 children, i.e., 10 children in each group was taken, comprehensive discussion on some of the issues of phonological awareness & orthographic skills for both groups could not be done.

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