

## Phonetic and Metaphonological Skills of Learning in Disabled Children

Dr. Swapna Sebastian, Paul Jasper, & Dr. Shyamala K C

---

---

### Introduction

Phonological development is the process of learning the mapping between auditory speech input and gestural control of speech output (1). Phonemes are the smallest units of speech which are written as graphemes and are acquired by age five. (2).

Speech sound difficulties can interfere with school performance and can typically exhibit reading and writing difficulties that are related to their speech errors (3). Phonological awareness is the knowledge of oral structure of speech sounds and the ability to access it and manipulate it. Phonological awareness is considered as an important skill needed for the acquisition and development of reading skills. (3)

The aim of the study was to investigate the speech sound production and metaphonological skills in Malayalam speaking children with learning disability in comparison to typically developing children.

### Materials and Methods

#### Objective

To compare the speech sound production skills and metaphonological skills of Malayalam speaking children with learning disability and typically developing (TD) children matched for sex and age.

#### Procedure

The study was approved by the research ethics committee of the Institution and informed consent were taken from the parents of the children. In-order to achieve the above goals, study was conducted on 2 groups of subjects - learning disabled children and control group.

34 children with learning disability between the age group of 5-9 years diagnosed by a multidisciplinary team consisting of a Neurologist, Speech Pathologist and Clinical Psychologist formed the experimental group.

The control group consisted of age and sex matched 34 typically developing children. All the participants used Malayalam as their mother tongue and were from the middle and upper strata of the socio-economic ladder.

Speech sound production was tested using the Malayalam Diagnostic Articulation test (4)

All the phonemes (11 vowels and 33 consonants) of Malayalam language were tested in the diagnostic articulation test.

**Administration:** Picture cards (86) were visually presented to the subjects in order to elicit the response.

**Scoring:** Each correct response was given a score of one and total scores for each subject was computed.

The following metaphonological skills were tested using the Test of reading and metaphonological skills.

Rhyme recognition,

Phoneme Oddity,

Phoneme Stripping/deletion, and

Phoneme reversal (5)

## **Results**

Statistical analysis was done using the software -IBM SPSS version 19. One way ANOVA was done to find whether there is any significant difference between the children with learning disability and the TD children.

Table 1 One-way ANOVA for Malayalam Diagnostic Articulation Test

Sub	LD	Normal	F	Significance
	85.09	86.00	188.732	0.09

Table 2 One-way ANOVA for Test for reading and metaphonological skills in Malayalam.

Subtest	LD	Normal	F	Significance
Rhyme recognition	5.59	10.52	87.50	0.000
Phoneme Oddity	3.4	6.97	24.94	0.000
Phoneme Stripping/deletion	0.00	2.67	37.79	0.000
Phoneme reversal	0.00	0.00	-	-

As shown in Table 1, both learning disabled children and controls performed equally in the Malayalam Diagnostic Articulation Test. Table 2 reveals that there was a significant difference between the learning-disabled children and typically developing children for the tests of rhyme recognition, phoneme oddity phoneme stripping

## Discussion

The scores obtained by the children with learning disability (85.09) were in par with the scores obtained by the normally achieving peers (85.30). The learning-disabled children between the age group of 5-9 years did not show any articulation problems.

The findings of our study is contrary to earlier studies which showed an unusually high prevalence of articulation disorders among individuals with learning disability (6).

Whether these children had a speech sound disorder during early developmental period is a matter of research interest. Literature shows mixed results on the relationship between speech sound disorder in early childhood and reading disability at school age (7) .

On comparison with the normally achieving children, it was found that the children with learning disability scored poor in all the metaphonological tests. This finding is consistent with other studies that have suggested that children with dyslexia perform more poorly than the normally achieving children on the tasks of phonological awareness, (Frith 1981, Torgensen 1985).

## **Conclusion**

The significantly poorer scores obtained by the learning-disabled children on the test of metaphonological skills and almost equal scores as compared to the normal peers on the articulation test suggests that the knowledge of the phonological constraints or rules of the language spoken (phonological awareness) is important for acquisition of academic skills and not the ability to articulate phonemes.

---

## **References**

1. Stoel-Gammon C. Relationships between lexical and phonological development in young children. *J Child Lang.* 2011;38(1):1–34.
2. Kelley, H.M., Litchfield, K.A. (2011). Phonemic Development. In: Goldstein, S., Naglieri, J.A. (eds) *Encyclopedia of Child Behavior and Development*. Springer, Boston, MA. [https://doi.org/10.1007/978-0-387-79061-9\\_2141](https://doi.org/10.1007/978-0-387-79061-9_2141).
3. Wertzner HF, Pulga MJ, Pagan-Neves L de O. Metaphonological skills among children with speech sound disorder: the influence of age and disorder severity. *Audiol-Commun Res.* 2014;19:243–51.
4. Maya. S. (1989), Malayalam Articulation test: An unpublished Masters Dissertation, University of Mysore.
5. Roopa., (1999). Test for reading & metaphonological skill in Malayalam An unpublished Masters Dissertation, University of Mysore.

6. Tambyraja SR, Farquharson K, Justice L. Reading risk in children with speech sound disorder: prevalence, persistence, and predictors. *J Speech Lang Hear Res.* 2020;63(11):3714–26.
  7. Sices L, Taylor HG, Freebairn L, Hansen A, Lewis B. Relationship between speech-sound disorders and early literacy skills in preschool-age children: impact of comorbid language impairment. *J Dev Behav Pediatr.* 2007 Dec;28(6):438-47. doi: 10.1097/DBP.0b013e31811ff8ca. PMID: 18091088; PMCID: PMC2755217.
- 

Dr Swapna Sebastian  
Professor (Audiology and Speech Pathology)  
Department of Otorhinolaryngology  
Christian Medical College & Hospital, Vellore  
Tamilnadu, India-632004  
[swapnasanthoshchris@gmail.com](mailto:swapnasanthoshchris@gmail.com)

Paul Jasper  
Lecturer (Audiology and Speech Pathology)  
Department of Otorhinolaryngology  
Christian Medical College & Hospital, Vellore  
Tamilnadu, India-632004  
[jasperpaul2612@gmail.com](mailto:jasperpaul2612@gmail.com)

Dr Shyamala, K C., Professor (retired)  
All India Institute of Speech and Hearing  
Manasagangothri, Mysore 570006, Karnataka, India  
[shyamalake@yahoo.com](mailto:shyamalake@yahoo.com)