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PHONOLOGICAL PROCESSES IN MALAYALAM-SPEAKING 5-6 YEAR OLD URBAN AND RURAL CHILDREN

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A dissertation submitted as a part of fulfillment for fourth semester of

"MASTER IN AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY"

MANGALORE UNIVERSITY

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MAY-2018

CERTIFICATE

This is to certify that the dissertation entitled **"PHONOLOGICAL PROCESS IN MALAYALAM SPEAKING 5-6-YEAR-OLD URBAN AND RURAL CHILDREN"** is the bona fide work in part fulfillment of fourth semester of Master in Audiology and Speech Language Pathology of the student with **Register No.169570603.**

Mangalore

May 2018

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CERTIFICATE

This is to certify that the dissertation entitled **"PHONOLOGICAL PROCESS IN MALAYALAM SPEAKING 5-6 YEAR OLD URBAN AND RURAL CHILDREN"** has been prepared under my guidance and supervision.

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DECLARATION

I hereby declare that this dissertation entitled "**PHONOLOGICAL PROCESS IN MALAYALAM SPEAKING 5-6-YEAR-OLD URBAN AND RURAL CHILDREN"** is the result of my own study under the guidance of Mr. Satish K., professor, Dr. M. V. Shetty College of Speech and Hearing, Mangalore, and has not been submitted earlier at any other university for any other diploma or degree.

May 2018 **AZHARUDHEEN CV**

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DEDICATED

TO

MY LOVING

FAMILY& FRIENDS

ACKNOWLEDGEMENT

"If you are grateful, I would certainly give you more; and if you are ungrateful, My chastisement is truly severe." (14:7)

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(alaku, alphi, pandy (Elizabeth my 6 year friend) jemi, jibi, aakram (Priyanka),sebu, shiyoo, sneha & sru…..)

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Azharudheen cv

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CHAPTER-1

INTRODUCTION

Language refers to a rule based system of symbolic communication involving a set of small units (syllables or word) that can be combined to yield an infinite number of larger language forms (Hoff & Naigles, 2002).

Phonology is a branch of linguistics concerned with the systematic organization of sounds in language. It has traditionally focused largely on the study of the system of phonemes in particular language

Phonological processes are pattern of sound errors that typical children simplify their speech as they are learning to talk. They do this because they don't have the ability to coordinate the lips, tongue, teeth, palate and jaw for clear speech. As a result, they simplify complex words in predictable ways until they develop the coordination required to articulate clearly, for example, they may reduce consonant clusters to a single consonant like, "pane" for "plane" or delete the weak syllable in a word saying, "nana" for "banana." There are many different patterns of simplifications or phonological processes namely Syllable Structure processes, Substation processes, and Substitution processes

Researches in western languages have focused on phonological development and various processes seen in developing children. Also several Indian studies focused on the similar area in a variety of Indian languages like Tamil, Kannada, Hindi, and Malayalam (Bharathy, 2001; Ramadevi & Prema 2002 and Rahul, 2006).

Stewart (2003) concluded that phonological process most frequently used were cluster reduction (77%), final consonant deletion (41%), stopping of affricate (25%), gliding of liquids (24%) and vowelization of /r/ (22%) in children aged 2years.

Manish and Kumarasamy (2011) compared phonological processes in Hindi speaking 3-4-year-old urban and rural children and found higher phonological processes in rural children when compared to urban children.

Simon and Kumaraswamy (2015) concluded that children in both rural and urban groups demonstrated a wide array of phonological processes. The higher percentages of phonological processes were noticed in rural children.

The knowledge of phonological development has a great significant in the clinical population to determine whether a child is phonologically disordered and needs intervention. However, a limited understanding of phonological development and a scarcity of data to evaluate the differences between the language conditions seen in urban and rural children might lead to a risk of misdiagnosis. Hence, the present study focuses on comparing the phonological processes across urban and rural in typical Malayalam speaking children.

CHAPTER- 2

REVIEW OF LITERATURE

The child's language development is commonly divided into paralinguistic behavior, vocalization prior to the first true word and linguistic development, which starts with the appearance of these first words.

Phonological development is the acquisition of speech sound form and function within the language system (Mandel, Jusczyk & Pisoni, 1995). The acquisition of various speech sounds are intricately connected to the child's overall growth in language (Bauman- Waengler, 2004). The speech sound development refers, primarily to the gradual articulatory mastery of speech sound forms within a given language.

Phonological process is defined as systematic sound change or simplification that affects a class or sequence of sounds (Bernthal & Bankson ,1988). All children use these processes while their speech and language are developing. For example, very young children (ages 1 to 3) may say 'wa-wa' for water or "tat" for "cat". Other children may leave out the final sound in a word (for example, "pi" for "pig" or "ha" for "hat"). Up to age 3, these are appropriate productions. As children mature, their speech they stop using these patterns to simplify words. In fact, by age five, most children stop using all phonological processes and their speech sounds are more like adults. As children stop using phonological processes their speech becomes more understandable. This allows them to become better at communication.

According to Gurnwell (1985) Phonological processes can be characterized into three major categories:

1) Syllable Structure Processes
2) Substitution Processes
3) Assimilation Processes

1. **Syllable structure processes** are changes that affect the syllabic structures of a target word. Common Syllable Structures are Weak Syllable deletion, Cluster reduction, Deletion of Final consonant and Glottal replacement.

Weak syllable deletion (unstressed syllable deletion): an unstressed syllable is deleted, often at the beginning of a word, sometimes in the middle.

Eg: Telephone (tefon)

Potato (teto)

Consonant deletion: most often affect the final consonant, though initial and medial consonants may also be omitted.

Eg: Book (bu)

Cap (ka)

Diminutization: it is the processes of adding /i/ or consonant plus /i/ to a word. The resultant word is considered as immature speech pattern.

Eg: Hat (h ti)

Dog (dagi)

Doubling: Stoel-Gammon & Dunn (1985) defined "doubling" as the process of repetition in a word. Although some writers view use of reduplication as a developmental stage that all children pass through, others maintain that reduplication, like other phonological processes, represents an individual strategy characterizing the speech of some but not all children at some developmental point. In reduplication, usually a monosyllabic word, results in a multisyllabic word. This process is similar to the process of reduplication which has been categorized as harmony or assimilation process.

Eg: Ball (baba)

Bed (bebe)

Glottal replacement: Glottal replacement is the process of substituting a glottal stop for a consonant. Weiner (1979) hypothesized that it serves as a marker for an omitted consonant

Eg: Bath (b)

Fishing (fi?in)

Cluster reduction: like other reduction processes, cluster reduction alters syllable structure also closely related to the segment substitution process in that the specific consonants omitted are typically those difficult to produce as singleton consonant. Cluster reduction is the process in which one of the consonants of a consonant cluster is omitted.

Eg: Park (pak)

Break (bek)

Coalescence: When two phonemes are substituted with a different phoneme that still has similar features.

Eg: Swim (frm)

Snow (nov)

Reduplicating: A syllable or a portion of a syllable is repeated, or target word is repeated.

Eg: Dad (dada)

Water (Wawa)

Epenthesis: refers to the addition of a vowel.

Eg.: School (sakul)

Black (balk)

2. **Substitution processes:** one sound is substituted for another, with the replacement reflecting changes in the place of articulation, manner of articulation, or some other change in the way a sound is produced in standard production.

Stopping: fricatives or affricates are replaced by stops.

Eg: Zoo (du)

Peach (pit)

Fronting: when velar or palatal sounds, like /k/, /g/ and /sh/ are substituted with alveolar sounds like /t/, /d/ and /s/

Eg: cookie (tooties)

Backing: when alveolar sounds, like /t/and /d/, are substituted with velar sounds like /k/and /g/

Eg: dog (gog)

Deaffrication: When an affricate like /ch/ or /j/ is replaced with a fricative or stop like /sh/ or /d/

Eg: chips (ships)

Affrication: fricatives are replaced by affricates.

Eg: sun (ts n)

Shoe (t u)

Palatalization: Palatalization occurs when a sound is produced as a palatal rather than as a non-palatal. This occurs on sibilants and clusters (Hodson, 1980).

Eg: Soup (up)

Cream (im)

Vowel Neutralization: Nasal vowels tend to be changed into oral vowels and vowels in general are often centralized, i.e. (ə) or (ɐ).

Eg: juice (ju)

Depalatalisation: when a palatal sound is substituted with a non-palatal sound

Eg: tie (pie)

Gliding: prevocalic liquids are replaced by glides.

Eg: run (w n)

Rain (wen)

Vocalization: liquids or nasals are replaced by vowels.

Eg: Bird (bed)

Bottle (bado)

3. Assimilation processes: It is a common phonological process by which the phonetics of speech segment becomes more like that of another segment in a word.

Velar assimilation: a non-velar sound is changed to a velar sound because of the influence of the velar.

Eg: Duck (g k)

Nasal assimilation: a non-nasal sound is assimilated because of the influence of a non-nasal consonant.

Eg: Fun (n n)

Nose (none)

Alveolar assimilation: It refers to the case when non alveolar sound is changed to alveolar consonant in the presence of an alveolar sound in the adult standard.

Eg: doggie (d di)

Cat (t t)

Voicing assimilation: There are two types, prevocalic voicing and final consonant voicing

Eg: Big (bib)

Lag (d g)

Syllable harmony: this refers to the repetition of all or part of a syllable.

Eg: water (wawa)

Bottle (baba)

Labial assimilation: a non- labial sound is assimilated to a labial consonant.

Eg: Boat (bop)

WESTERN STUDIES

Smith, Hoffman (2018) evaluated phonological skills in Forty-four Bilingual children using measures designed for monolingual English speakers who were at risk for misdiagnosis of speech sound disorder. Children's single-word speech productions were examined on Percentage Consonants Correct-Revised and accuracy of early, middle, and late-developing sounds. Consonant accuracy in English was compared between monolinguals and bilinguals with and without speech sound disorders. Percentage Consonants Correct-Revised was found to be a good indicator of phonological ability in both monolingual and bilingual English-speaking children at the age of 5. No significant differences were found between language groups on any of the measures examined. Results suggest that traditional measures of phonological ability for monolinguals could provide good diagnostic accuracy for bilingual children at the age of 5 years.

Smith, Goldstein (2010) investigated the contribution of language interaction to phonological acquisition in bilingual Spanish-English speaking children. Single word and connected speech samples were obtained for 24 typically developing children. This study examined interaction between the two languages of bilingual children during phonological acquisition through the measurement of (a) transfer (the frequency and types of phonological transfer present in the speech of bilingual children); (b) deceleration (a slower rate of acquisition for bilinguals as compared with monolinguals); and (c) acceleration (a faster rate of acquisition for bilinguals as compared with monolinguals. The results indicated that transfer, deceleration, and a possible variation of the acceleration hypothesis occur in bilingual phonological acquisition.

Stewart (2003) took spontaneous speech sample of 8 children of 2 years of age of African American English speaking children in playful condition and sample of audio and video was taken. These children used the 18 phonological process as identified by ISPA (Interactive System for Phonological Analysis). Each process was calculated by using the total number of occurrences divided by the total number of opportunities for that process to occur. This calculation yielded a percentage for each process for all the participants. The process most frequently used were cluster reduction (77%), final consonant deletion (41%), stopping of affricate (25%), gliding of liquids (24%) and vowelization of /r/ (22%).

Goldstein & Washington (2001) conducted a collaborative study to investigate phonological patterns in 12 typically developing 4 year old bilingual (Spanish- English) children. The results indicated that there were no significant differences between the two languages on percentage of consonant correct; or percentage of occurrence for phonological process. Most commonly occurring phonological process included stopping and final consonant deletion in English and liquid simplification and cluster reduction in Spanish.

Goldstein and Iglesias (2001) examined the effect of dialect on phonological analysis in Spanish speaking children. Result indicated that the number of consonant errors, percentage of consonants correct, number of errors within individual sound classes, and percentage of occurrence for phonological process, all were different based on the accounting of dialect features.

James (2001) examined the occurrence of 3 phonological processes in 50 Australian children across the range of 2-7.11 years. Result showed that the greatest reduction in phonological process was between 3-4 years of age. Phonological process that persist beyond 4 years of age were velar fronting & cluster reduction.

INDIAN STUDIES

In situations where the child's native language is not English or when a child speaks a language it would not be appropriate to apply the sound development norms for an English phonological system. It is important to become familiar with the phonological (sound) and linguistic system of the child's primary or dominant language.

The literature on phonological process is mostly from the Western studies and is inadequate in Indian languages. Therefore, we know relatively little about the phonological development in Indian languages. However, in the recent past a number of such studies have been attempted in several Indian languages focusing on the normal phonological process usage and these have been briefly reviewed in table below.

AUTHOR	LANGUAGE	AGE GROUP	COMMON PROCESS OBSERVED
Sunil (1998)	Kannada	3-4years	Fronting, cluster reduction, Initial consonant deletion and affrication.
Sameer (1998)	Malayalam	3-4 years	Cluster reduction, final consonant deletion ,epenthesis, affrication, de affrication etc.
Jayashree (1999)	Kannada	4-5years	Fronting, cluster reduction, and retroflex deletion.
Ranjan (1999)	Hindi	4-5years	Cluster reduction, partial reduplication and aspiration.
Bharathy (2001)	Tamil	3-4years	Epenthesis, cluster reduction, gliding, nasal assimilation, voicing, de-affrication, stopping, and fronting.
Santhosh (2001)	Hindi	4-5years	Cluster reduction, partial reduplication aspiration.
Ramadevi (2002)	Kannada	5-6years	Stridency deletion, de aspiration, and

			retroflex deletion.
Sreedevi, Jayaram & Shilpashree (2005)	Kannada	2-3years	Retroflex fronting, trill deletion, depalatalization.
Rahul (2006)	Hindi	2-3years	Retroflex fronting, affrication, de aspiration, de nasalization, stopping.
Merin & Sreedevi (2010)	Malayalam	3-3.6years	Cluster reduction, epenthesis, stopping.
Manish & Kumarasamy (2013)	Hindi	3-4years	Consonant deletion, weak syllable deletion epenthesis fronting, palatalization, stopping, and aspiration.
Simon and Kumarasamy (2015)	Malayalam	3-4years	Cluster reduction, Consonant deletion, weak syllable deletion epenthesis fronting, palatalization, fronting, gliding, aspiration, nasal assimilation being the common types

Table 2.1: Studies on phonological processes in Indian language

NEED OF THE STUDY

The knowledge of phonological development has a great significance in the clinical population to determine whether a child is phonologically disordered and needs intervention. However, a limited understanding of phonological development and a scarcity of data to evaluate difference between the language conditions seen in urban and rural children might lead to risk of misdiagnosis. Hence, the present study focuses on comparing the phonological processes across urban and rural in the Malayalam speaking children.

AIM

The present study aimed to examine the phonological process seen in 5-6 years typical Malayalam speaking urban and rural children.

CHAPTER-3

METHODOLOGY

The present study aims to compare the phonological processes in typical Malayalam speaking 5-6 years old urban and rural children with following objectives.

a) To describe the percentage and types of phonological processes exhibited by 5-6 year old typical Malayalam speaking urban and rural children.
b) To compare the percentage and types of phonological processes across the group (urban Vs rural) children.

PARTICIPANTS

A total number of 40(20 from urban and 20 from rural) from Calicut and Pathanamthitta typical Malayalam speaking children in the age range of 5-6 years (mean age of 5.5years) participated in the study.

SUBJECT SELECTION CRITERIA

Inclusion criteria

- Native speakers of Malayalam and attending normal school.
- Normal oral speech mechanisms

Exclusions criteria

- history of speech, language, or hearing problems.
- neurological deficits.
- reported difficulties in behavioral and / intellectual functioning.

Stimuli

The study included compilation of speech samples using two stimuli. Picture card depicting nature chosen from the 1st grade Malayalam test book was used for picture description task. Single word production – a Malayalam articulation test was administered on each child after presenting adequate test trail and instruction. The test included 100 isolated words with target consonants, diphthongs and vowel tested in all initial, medial and final position.

Equipment

The speech samples were recorded using external micro phone in to the HP laptop. PRAAT voice recording and analysis software 5.3 14 version (Boersma and Weenink ,2007) was used.

Test environment:

Samples were collected in a quiet room with adequate illumination. One child was taken at a time for recording and one foot distance was maintained between the client and examiner seating. Child was asked to repeat the stimuli after the researcher and describe the picture card given.

Procedure and analysis

A rapport was built up with the child before eliciting the target speech sample. Each child was made to describe the picture presented to him/her in a complete sentence. Malayalam articulation test was administered. Each child was presented with words and child was response to repeat it back. Maximum attempts were made to obtain the spontaneous production of all the target words. The audio recorded samples were transcribed using International Phonetic Alphabets (IPA)-5 by a speech language pathologist and analyzed sound by sound and syllable by syllable. The phonological processes were identified by analyzing the whole word and the entire target phoneme in the word. Later, these were grouped into three major categories namely Syllable Structure process, Substitution process and Assimilation process.

The obtained data was statistically analyzed, and the results are described in next chapter.

CHAPTER- IV

RESULTS AND DISCUSSION

The present study aimed at studying the phonological processes occurring in 5-6 years old typically developing Malayalam speaking Urban and Rural children. The comparison of two groups Urban and Rural and in terms of percentage of subjects is indicated in tables and graphically represented in figures.

Syllable structure process:

syllable structure processes	Group	N	Mean	Std. Deviation	Mannwhitney test p value	
weak syllable deletion	Urban	20	.00	.000	.317	NS
	Rural	20	.05	.224		
intial consonant deletion	Urban	20	.00	.000	.152	NS
	Rural	20	.10	.308		
final consonant deletion	Urban	20	.05	.224	.037	sig
	Rural	20	.40	.681		
cluster reduction	Urban	20	.75	.786	.001	HS
	Rural	20	1.85	.875		
diminutization	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
epenthesis	Urban	20	.35	.489	.043	sig
	Rural	20	.85	.813		
doubling	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
coalscence	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
glottal replacement	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		

Table 4.1: Rural and Urban children exhibiting phonological processes in category of syllable structure processes

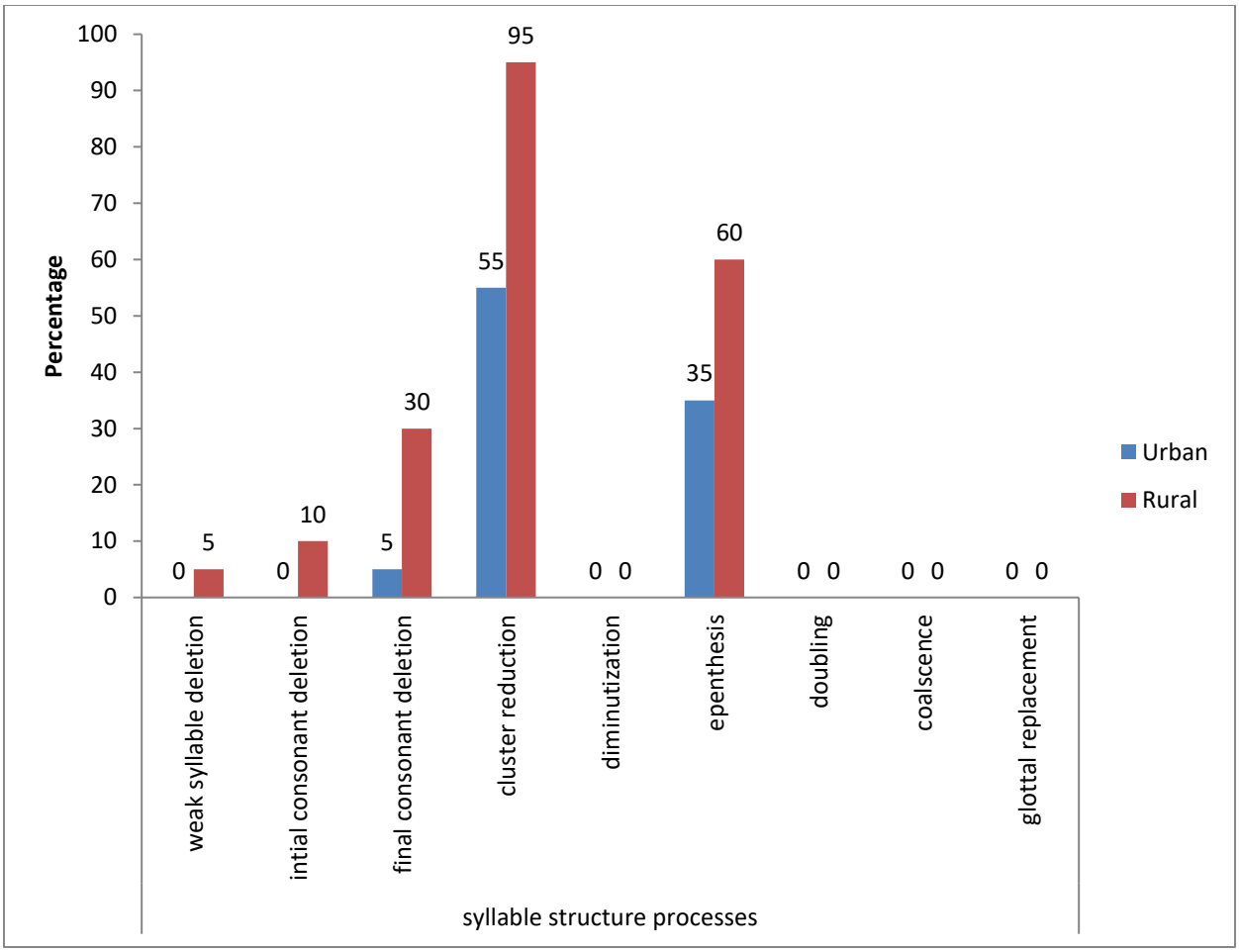

Fig 4.1: Percentage of subjects exhibiting different phonological processes for Rural & Urban children

No significant difference was seen for weak syllable deletion (p=.1156), initial consonant deletion (p=0.073), diminutization (p=1.000), doubling(p=1.000), coalescence(p=1.000), and glottal replacement(p=1.000)

Significant difference was noticed for final consonant deletion(p=0.037), epenthesis(p=0.043).

Highly significant difference was noticed for cluster reduction(p=0.001).

Substitution process:

substitution processes	Group	N	Mean	Std. Deviation	Mannwhitney test p value	
stopping	Urban	20	.15	.366	.004	HS
	Rural	20	1.05	1.191	.	.
fronting	Urban	20	.10	.308	.204	NS
	Rural	20	.35	.745		
backing	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
affrication	Urban	20	.15	.489	.041	sig
	Rural	20	.45	.605		
deaffrication	Urban	20	.00	.000	.152	NS
	Rural	20	.10	.308		
palatalization	Urban	20	.05	.224	.317	NS
	Rural	20	.00	.000		
depalatalization	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
gliding	Urban	20	.20	.410	.002	HS
	Rural	20	1.20	1.196		
vocalization	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
vowel neutralization	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		

Table 4.2: showing phonological processes in category of substitution processes for rural & urban children

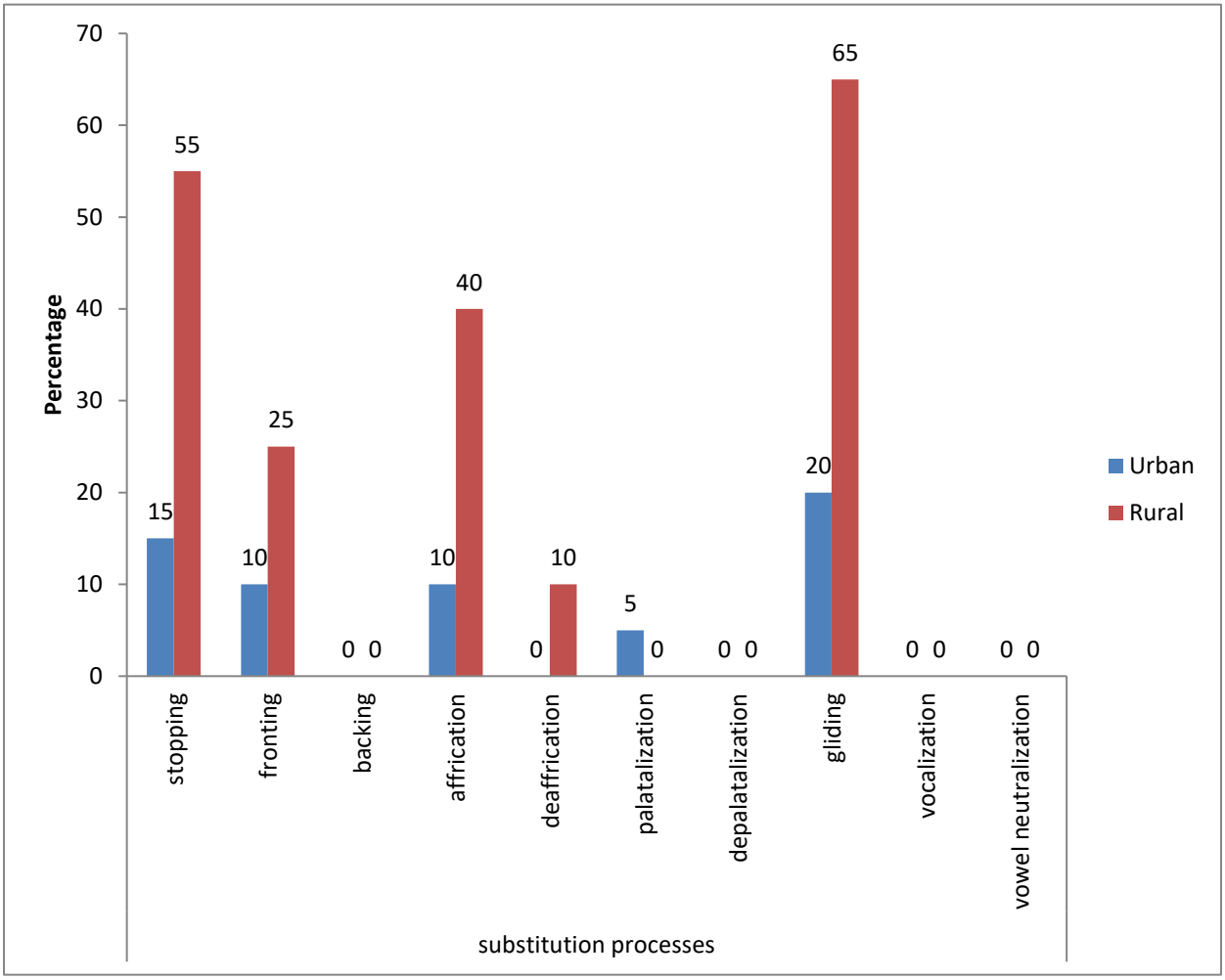

Fig 4.2: Percentage of phonological processes for rural & urban children

No significant difference was seen for fronting (0.204), backing (1.000), deaffrication (0.152), palatalization(0.317), Depalatalization (1.000), vocalization(1.000), vocal neutralization(p=1.000)

Significant difference was seen for affrication(p=0.041),

Highly significant difference was noticed for stopping(p=0.004), gliding(p=0.002).

Assimilation process:

Assimilation	Group	N	Mean	Std. Deviation	Mannwhitney test p value	
velar assimilation	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
alveolar assimilation	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
nasal assimilation	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
voicing assimilation	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		
syllable assimilation	Urban	20	.00	.000	1.000	NS
	Rural	20	.00	.000		

Table 4.3: Rural and Urban children exhibiting phonological processes in category of Assimilation process

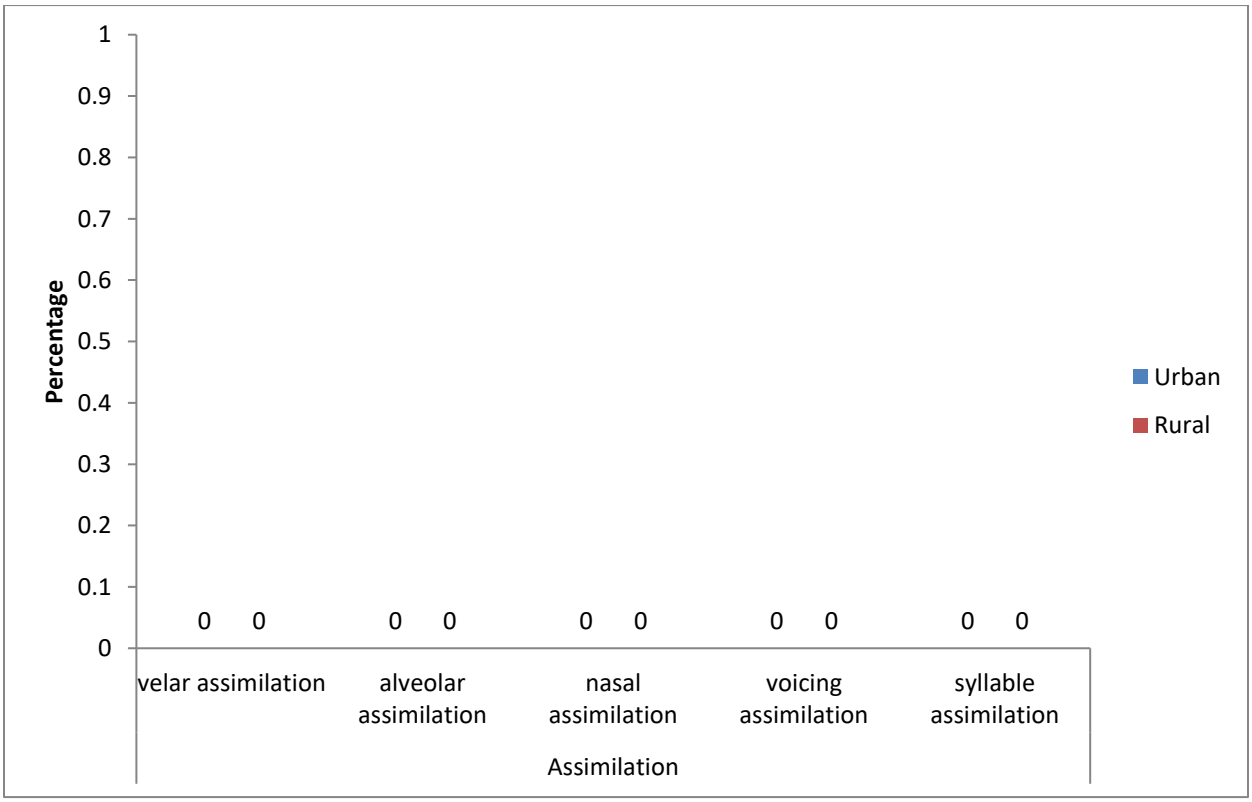

Fig 4.3: Percentage of phonological processes for rural & urban children

No significant difference was seen for velar assimilation, alveolar assimilation, nasal

Assimilation, voicing assimilation, syllable assimilation (p=1.000)

DISSCUSION

In 5-6-year-old urban children weak syllable deletion, initial consonant deletion, diminutization, doubling, coalescence, glottal replacement, backing, depalatalization, deaffrication, vocalization and vowel neutralization were absent. While cluster reduction was found to be more frequent. And final consonant deletion, epenthesis, stopping, fronting, affrication, palatalization and gliding were found to be less frequent.

In rural children diminutization, doubling, coalescence, glottal replacement, backing, palatalization, depalatalization, vocalization and vowel neutralization was found to be absent while cluster reduction, epenthesis, stopping and gliding were found to be more frequent. And weak syllable deletion, final consonant deletion, initial consonant deletion, fronting, affrication and deaffrication were found to be less frequent.

The second finding of the study revealed lower percentage of correct responses and hence higher phonological processes in Rural children when compared to those in Urban children. The limited educational facilities and lack of parental attention given to a child's utterance can be attributable to the greater number of errors seen in rural children. It was noted during the study that people living in urban areas have much better living and health condition rural areas in India. Rural areas are generally economically very poor when compare to urban areas, especially in india, and the amount of attention and care given to children is very limited. Thus, perhaps the rural children make more errors (simplification) of sounds without any means of learning the correct production. Also, in rural India, parents seldom educate their children, and even if they do the quality of educate is much lower than that in urban areas. This might lead to less developed metalinguistic and cognitive skills. Thus, being one of the major reasons for more phonological

processes. The standard of living, health care and other facilities might also minimally contribute to the linguistic differences seen in urban and rural children.

CHAPTER- V

SUMMARY AND CONCLUSION

Language is referred as a system of communication using sound or symbols that enables us to express our feelings, thoughts, ideas and experience (Thomson 2008). Children expresses their vocabulary of word; they also demonstrate an emerging phonological system. Developmental phonologies have observed that a young child usually makes these substitution and omissions in predictable ways. Phonological process is defined as the linguistic sounds suffering a great quantity of changes valuable both in the normal flow of the language and in the course of time. The knowledge of phonological development has a great significance in the clinical population to determine whether a child is phonologically disordered and needs intervention.

In the present study an attempt was made to study the different phonological processes occurring in 5-6 typical Malayalam speaking urban and rural children. In a total of forty children, twenty each in the urban and rural group were included in study. The study involved single word production using Malayalam Articulation Test which included target consonants, diphthongs and vowels to be tested in both initial and final positions. The elicited target words were audio recorded and later analyzed for identifying various phonological processes as Syllable structure processes, Substitution processes, Assimilation processes.

In 5-6-year-old urban children weak syllable deletion, initial consonant deletion, diminutization, doubling, coalescence, glottal replacement, backing, depalatalization, deaffrication, vocalization and vowel neutralization were absent. While cluster reduction was found to be more frequent. And final consonant deletion, epenthesis, stopping, fronting, affrication, palatalization and gliding were found to be less frequent.

In rural children diminutization, doubling, coalescence, glottal replacement, backing, palatalization, depalatalization, vocalization and vowel neutralization was found to be absent. while cluster reduction, epenthesis, stopping and gliding find to be more frequent. And weak syllable deletion, final consonant deletion, initial consonant deletion, fronting, affrication and de-affrication were found to be less frequent.

Implication of the study

● The study provides detailed understanding of phonological development among Malayalam speaking urban as well as rural children. Thereby, highlighting the difference between the two groups which would help in further assessment and intervention of these children in clinical settings.

● Provides an overview over emerging and suppressing patterns of phonological processes among native Malayalam speaking 5-6-year-old children.

● The study also provides basis for planning of phonological remediation.

Limitations of the study

● Test dues note account for dialectical variation.

● Equal number of boys and girls are not considered in the study.

Future directions

● Future studies should focus on broader data collection.

● Furthermore, future studies should involve comparison across children of different age groups**.**

● The study can also be extended to different Indian languages.

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APPENDIX

Picture discrimination


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Food Store
Auction House
marketplace
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