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Language in India www.languageinindia.comISSN 1930-2940 Vol. 16:8 August 2016
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# Comparison of Speech Measures between Tamil and Malayalam

Sreelakshmi R. & Rakesh Murali

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**Abstract**

A continuous fluent speech is not just the flow of sounds and syllables but also the flow of continuous information. Rate of speech is one among the facet of fluency which can be defined as the number of words or syllables uttered per second. Diadochokinetic rate refers to an assessment tool which measures how rapidly a person can precisely generate a sequence of rapid and alternating sounds.

The rationale of this study was to compare the rate of speech and Diadochokineticrate of adults between Tamil language and Malayalam language and check the correlation between rate of speech and Diadochokinetic rate within and across language. Fifty participants, i.e., twenty five each in both the languages, with equal number of both the genders were included in the study. All the participants were having normal speech, language and hearing skill. Speech samples, recorded using PRAAT software, were collected in monologue, oral reading as well as picture description for attaining the rate of speech (words per minute) in both the languages. Alternate Motion Rate (AMR) and Sequential Motion Rate (SMR) were calculated by using count per time method.

The results revealed that there was a highly significant difference ($p<0.001$) in rate of speech and no significant difference in DDK results between Malayalam and Tamil speakers. Even though, Tamil speakers were found to have faster rate of speech, their Diadochokinetic rates were similar to those of Malayalam speakers. Results showed that DDK results were independent of rate of speech.

The study clearly indicates that there is a significant difference in many parameters of speech across languages. Hence, there is a requirement of separate normative for the speech assessment in different languages.

**Key Words**: Tamil, Malayalam, Rate of speech, Diadochokinetic rate.

## Introduction

Rate of speech is an important dimension of fluency which can be defined as the number of words or syllables uttered per unit of time. Speech rate is estimated from samples of connected speech spoken spontaneously or read.

Diadochokinetic rate is an assessment tool which measures how rapidly a person can precisely generate a series of rapid and alternating syllables i.e. ability to replicate a segment of speech at high rate. Diadochokinetic rates aid to conclude any problems in the speech mechanism that control motor skills or speech planning functions in the brain. The two methods to obtain these measures are, counting the number of syllable repetitions in a given epoch of time and counting the number of seconds to repeat a predetermined number of syllables. Alternating Motion Rate (AMR) and Sequential Motion Rate (SMR) are used to assess the Diadochokinetic rate. Syllable repetitions performed as rapid as possible gives a convincing probe of the maximum speaking rate being an important measure of articulatory performance.

Therefore, this present study attempted to compare the rate of speech between Tamil and Malayalam native speakers. And to check whether the Diadochokinetic rate and speech rate correlates with each other.

## Review of Literature

The type of syllable, duration of utterances, type of speaking condition as well as perception of information can influence rate of speech.

Sreelakshmi (2016) compared the rate of speech between typical Malayalam and Nepali speakers and suggested that there is a significant difference in the rate of speech across languages as well as diadekokinesis and rate of speech are related.

A cross linguistic study for various Indian languages was conducted by Rathna and Bharadwaja (1977) and concluded that the rates of speech in words per minute for languages such as Hindi, Punjabi, Kannada, Tamil and Marathi in reading task were 198, 163, 193, 127 and 131 respectively.

The rate of speech in 20 Punjabi speakers aged 18-40 years was studied by Deepti and

Anuradha (2011) and revealed that the rate of speech in reading is higher than picture description for both males and females. Broglio, et al (2013) reported a rapid rate of speech in clutters

**Need of the Study**

There is a need to carry out a study on the Diadochokinetic rate in normal Tamil speaking adults since there is a scarcity in cross linguistic speech studies.

**Aim of the Study**

The objective of the study is:-

- To compare the rate of speech in Tamil and Malayalam native speakers
- To check the correlation between rate of speech and Diadochokinetic rate within and across language.

**Methodology**

**Subjects**

Individuals with no significant history of any communication disorders, adequate speech intelligibility, medically fit and literate native speakers of each language were chosen for the study. 50 participants were selected which includes 25Tamil and 25 Malayalam native speakers aged 20-25 years, with equal number of both the genders.

**Method**

Samples were collected.

- Monologue: - Each of the participants was instructed to speak on the random topics given.
- Oral Reading: - Less familiar passages were given for reading task.
- Picture Description :- Standardized pictures were given to describe
- Diadochokinetic Rate. : - AMR and SMR were collected.

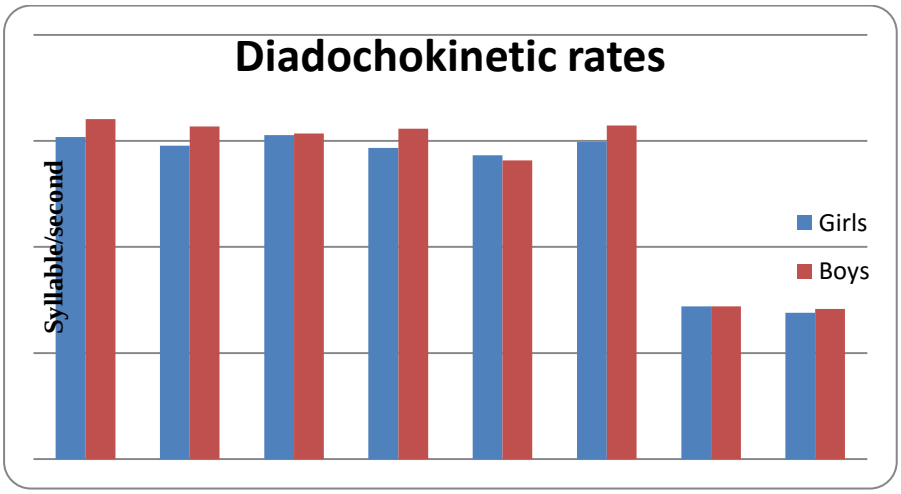
**Data Analysis**

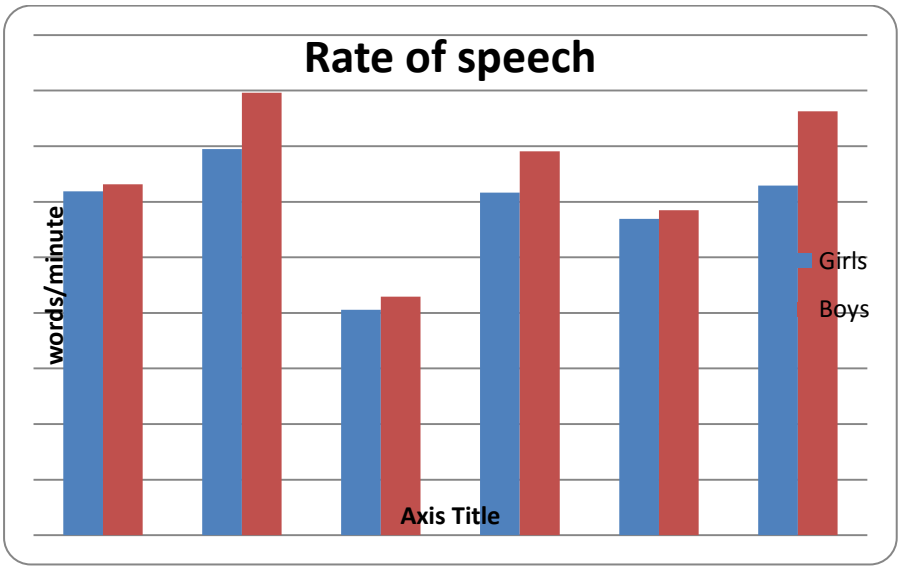
Speech samples were transcribed and rate of speech was measured in terms of words per minute. The data were subjected to statistical analysis to obtain the mean and standard deviation.

**Results& Discussion**

The study attempted to compare the rate of speech between Tamil and Malayalam native speakers aged 20-25 years. This study is also designed to find out the correlation between Diadochokinetic rate and speech rate.

Tamil girls were found to have more rate of speech than boys. Tamil girls have maximum words per minute in a monologue (mean: 159.20 WPM), compared to picture description (mean: 152.60 WPM) and the least was in passage Reading (mean 138.10). Tamil boys have maximum words per minute in a monologue (mean: 139 WPM), followed by a picture description (mean: 125.80 WPM) and passage reading (mean: 125.80 WPM).




Whereas, Malayalam native boys have a slightly more speech rate than girls .Malayalam native girls have maximum words per minute in a monologue (mean: 123.80 WPM), followed by

a picture description (mean: 113.80 WPM) and the least was obtained for passage reading (mean: 81.10). Malayalam native boys have maximum words per minute in a monologue (mean: 126.30 WPM), followed by a picture description (mean: 117WPM).The least was obtained in passage reading (85.8 WPM).

The Alternating Motion Rate (AMR) for /p^/, /t^/ and /k^/ is 6.27, 6.23 and 6.29 repetitions/Sec respectively and Sequential Motion Rate is 2.83 repetitions/Sec, for Tamil native girls. In boys, AMR for /p^/, /t^/ and /k^/ is 5.91, 5.87 and 5.98 repetitions/Sec respectively and SMR is 2.76 repetitions/Sec.

In the above graph, the Alternating Motion Rate (AMR) for /k^/, /t^/ and /P^/ is 5.73 , 6.07, 6.11 and repetitions/Sec respectively and Sequential Motion Rate is 2.88 repetitions/Sec, for Malayalam native girls. In boys, AMR for /t^//p^/and /k^/ is 6.41, 6.14 and 5.63 repetitions/Sec respectively and SMR is 2.88 repetitions/Sec.

Tamil native speakers have more rate of speech than Malayalam native speakers. Tamil speakers have maximum words per minute in a monologue(mean: 149.11 WPM), followed by picture description (mean: 139.20 WPM) and passage (mean:130.70 WPM), whereas Malayalam speakers have maximum words per minute in a monologue(mean: 125.05 WPM), followed by a picture description (mean: 115.40 WPM) and passage(mean: 83.45 WPM).

The mean AMR of /p^/, /t^/ and /k^/ is 6.24, 6.05 and 6.14 repetitions/Sec respectively in Tamil speakers, whereas 6.08, 6.11 and 5.60 repetitions/Sec respectively in Malayalam speakers. The mean SMR of Tamil speakers is 2.80 repetitions/Sec and in Malayalam speakers is 2.88 repetitions/Sec respectively.

The results revealed that there was a highly significant difference ($p<0.001$) in rate of speech and no significant difference in DDK results between Malayalam and Tamil speakers. Even though, Tamil speakers were found to have a faster rate of speech, but there was no significant difference across Diadochokinetic rates. DDK results were not dependent of rate of speech. These results are useful for identification and diagnosis of deviation in rate and for the intervention for speech timing disorders.

**Summary and Conclusion**

DDK rate is one among the subsystems of rate of speech where the subject has to move his articulators as much faster as he can combined with the production of the syllables loudly, clearly, rhythmically, and rapidly. Rate of speech depends on language proficiency, familiarity of the task, interest of the speaker, length of the words, cultural aspects, cognitive aspects etc. So we can conclude that Diadochokinetic rate is independent on rate of speech.

**Limitation**

Sample size was limited as well as the reading passage was not standardized in both the languages. Rate of speech was calculated by means of words/minute only.

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Sreelakshmi R., MASLP
Lecturer
Dr. M. V. Shetty College of Speech and Hearing

Malady Court
Kavoor
Mangalore – 575 015
Karnataka
India
lakshmilegacy.r@gmail.com

Rakesh Murali
MASLP Student
Dr. M. V. Shetty College of Speech and Hearing
Malady Court
Kavoor
Mangalore – 575 015
Karnataka
India
rakesh9m@gmail.com