

## **Rate of Speaking and Reading of Adult Nepali Speakers**

**Bikash Duwal, Bishwajit Karki, Krupa Saira George (MASLP) and  
Dr. Sunil Kumar. Ravi, Ph.D. (Speech Language Pathology)**

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### **Abstract**

**Introduction:** Rate of speech is one of the important aspects of fluency. Any disruptions in rate of speech will lead to disturbances in speech fluency and it has direct effect on the intelligibility of speech. The rate of speech may depend upon several factors such as coordination between speech subsystems, language competence, and the contextual factors and it can be an index for measuring the speed of articulatory movements during speaking. Although normal rate of speech is reported to be in the range of 80-180 words per minute, the mean values vary from language to language. Nepali, an Indo-Aryan language, is the language spoken widely in Nepal by approximately 17 million people. Although it is one of the important languages of Indo-Aryan family, not many studies are available about the characteristics and features of Nepali language. Hence, the present study was carried out with an aim of understanding the rate of speaking/reading of young Nepali speakers.

**Method:** 20 young (10 males and 10 females) native Nepali speakers in the age range of 20-30 years were taken for the present study. Rate of speech was measured using job task in which participants were asked to speak about their job for not less than 100 words or for 2 minutes. For measuring rate of reading, participants were asked to read a story passage in Nepali language with 256 words and 688 syllables at their comfortable speed. All the samples were recorded using Audacity software in Lenovo laptop software and the silent pauses with more than 150 ms were removed from the sample. The total duration and total number of words in both job task and reading task were measured. Rate

of speech and reading were measured as words per minute (WPM), syllables per minute (SPM), and syllables per second (SS).

**Results & Discussion:** analysis of speech samples of job task revealed higher rates of speech in males than that of females. Similarly, in rate of reading measures, higher rates were found in males compared to females although statistically not significant. Comparison between the tasks revealed significantly higher rates in job task than reading task.

**Conclusion:** the present study has established normative data for rate of reading and speaking in Nepali language. The present study also found that rate of speech is faster than that of rate of reading in both males and females in Nepali. The results of the present study can be helpful in diagnosing some of the fluency disorders in Nepali language.

**Keywords:** Nepali, rate of speech, rate of reading, words per minute, syllables per minute.

## **Introduction**

Fluency is one of the three dimensions of speech, which is defined as “effortless production of long utterances at a rapid rate” (Starkweather, 1981). Any kind of difficulty in parameters of fluency, such as effort, continuity or rate will result in dysfluent speech. The rate of speech is one of the important parameter of fluent speech and is defined as the words or syllables spoken in the given time period which is expressed in term of words or syllables spoken or read per second or minute.

Rate of speech affects both the fluency and intelligibility of an individual’s speech. Rate of speech provides information about the speed of articulatory movements and coordination between articulators during speech production (Gracco & Abbs, 1988). The rate of speech is measured as words per minute (WPM) or syllables per minute (SPM), or syllables per second (SPS) and it varies from task to task, individual to individual and language to language. Although, the three methods, WPM, SPM, and SPS

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are considered as appropriate measures in measuring rate of speech, syllables per minute (SPM) is considered to provide more reliable information as the speech consists of words with varying number of syllables (Hall, Amir, & Yairi, 1999; Pimsleur, Hancock, & Furey, 1977). The rate of speech can be measured using various tasks, such as spontaneous speech, or narration or picture description. The rate of speech can be measured either through speaking rate (number of syllables divided by the time taken) or articulation rate (number of syllables divided by the time taken without pauses). Articulation rate is considered as more reliable measure as the pauses in continuous speech can vary in duration which may have effect on overall rate of speech. The rate of speech is affected in various speech and language disorders including stuttering, cluttering, hearing impairment, dysarthria and other disorders. However, it is very important to know the normal rate of speech in each language and task to be able to differentially diagnose some of the speech disorders. Causes such as muscle weakness, impaired articulatory coordination, language deficits lead to abnormalities in rate of speech which affects the overall fluency of speech.

The past research on rate of speech in western context in English language have shown that the rate of speech is higher in adults (approximately 260 SPM) compared to children (190 SPM), although, the effect of gender is unclear. Andrews and Ingham (1971) have reported that the rate of speech in English language is between 115 to 165 words per minute and 162 to 230 syllables per minute. Another study by Darley and Spriesterbach (1978) have reported that the normal rate of reading is between 150 to 190 words per minute and 210 to 265 syllables per minute. From these studies it can be understood that the rate of speech varies across tasks in a language and the later studies by Amster, 1984; Crystal and House, 1990; and others have reported normative values for rate of speech across age groups and across tasks.

A Few studies were carried out in Indian languages such as in Kannada (Venkatesh Purushottama, and Poornima, 1983), Marathi (Jawadekar, 1999), Hindi (Rathna and Bharadwaja, 1977), Punjabi (Kaushal, Sharma, Munjal, and Panda, 2011).

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An extensive study was also carried out by Savitri and Jayaram (2008) in four Dravidian languages across the age groups from 3-3.11 to 90-100 years old groups and provided normative data for rate of speech in Kannada, Telugu, Tamil and Malayalam languages.

Nepali, an Indo-Aryan language, is the language spoken widely in Nepal by approximately 17 million people. Although it is one of the important languages of Indo-Aryan family, not many studies are available about the characteristics and features of Nepali language. However, there are no normative data available in Nepali language on rate of speech and reading. Hence, the present study was carried out with an aim of understanding the rate of speaking/reading of young Nepali speakers.

## **Method**

**Participants:** 10 male and 10 female native Nepali speakers in the age range of 20-30 years with mean age of 22.4 and 21.6 respectively participated in the study. Only subjects without any history of communication disorders, neurological, and psychiatric illness were selected for the study. All the subjects have completed their 12<sup>th</sup> education in Nepal and have enrolled into graduate programs at various universities in Bangalore.

**Materials:** Two tasks, namely, job task and reading task were used to assess the rate of speech in Nepali language. In job task, all the participants were asked to speak about their job/studies for not less than two minutes. For reading task, participants were asked to read a story passage in Nepali language consisting of 256 words and 688 syllables at their comfortable speed.

**Procedure:** All the subjects were asked to sit in a quiet room and were instructed to speak about their job for duration of two minutes and read the given story at a comfortable loudness. The speech was recorded using Audacity software V2.0.5 in Lenovo laptop with a headset which is placed at an approximate distance of 10 cm from the mouth.

**Analysis:** The recorded samples were edited using Praat V4.0 software to remove the silent pauses of more than 150 msec. The total duration and total number of words in both job task and reading task were measured. Rate of speech and reading were measured as words per minute (WPM), syllables per minute (SPM), and syllables per second (SS).

**Words per minute (WPM) = Total number of words X 60/Total duration in seconds**

**Syllables per minute (SPM) = Total number of syllables X 60/Total duration (in sec)**

**Syllables per second (SPS) = Total number of syllables/Total duration (in sec)**

## Results and Discussion

The recorded samples were analyzed and the data were analyzed using SPSS software V16.0 for measuring the rate of speech across tasks and across genders. Results are given separately for each task.

### Job Task

Total number of words was measured along with total duration. The rate of speech was measured as WPM, SPM and SPS and the mean and standard deviation (SD) of rate of speech are given in Table 1. Independent sample t-test was done to compare the rate of speech between males and females and the results are given in Table 1.

**Table 1.** Mean and SD of rate of speech for job task across genders.

	Combined (n=20)		Males (n=10)		Females (n=10)		t- value
	Mean	SD	Mean	SD	Mean	SD	
<b>WPM</b>	154.40	15.40	159.9	7.37	148.9	19.4	1.671
<b>SPM</b>	322.55	41.36	337.3	13.76	307.8	54.21	1.668
<b>SPS</b>	5.45	.75	5.80	0.42	5.1	.87	2.278*

Note:- \*:  $p < 0.05$

### Reading Task

Total number of words was measured along with total duration for reading task. The rate of speech was measured as WPM, SPM and SPS and the mean and standard deviation (SD) of rate of speech are given in Table 2. Independent sample t-test was done to compare the rate of speech between males and females and the results are given in Table 2.

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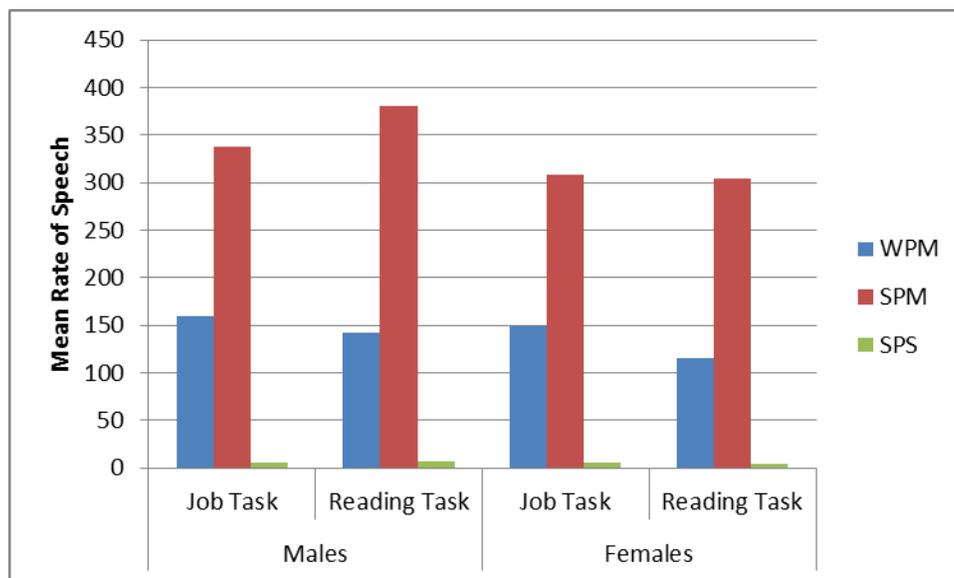
**Table 2.** Mean and SD of rate of speech for reading task across genders.

	Combined (n=20)		Males (n=10)		Females (n=10)		t- value
	Mean	SD	Mean	SD	Mean	SD	
<b>WPM</b>	128.85	21.42	141.80	17.75	115.9	16.80	3.353**
<b>SPM</b>	342.70	58.47	381.20	304.20	304.2	40.36	3.887**
<b>SPS</b>	5.55	1.09	6.30	.82	4.8	.78	4.160**

Note:- \*\*:  $p < 0.01$

**Comparison between the Tasks**

Comparison of rate of speech between job task and reading task was done for each gender group and for combined group to find out the effect of task on rate of speech. The results of paired sample t-test revealed significant differences between job task and reading task on WPM ( $t = -5.188, p < 0.05$ ) measures but not on SPM ( $t = 1.577, p > 0.05$ ) and SPS ( $t = .462, p > 0.05$ ) for combined group. For males, results revealed significant differences for WPM ( $t = -2.683, p < 0.05$ ) and SPM ( $t = 2.385, p < 0.05$ ) measures but not for SPS ( $t = 1.464, p > 0.05$ ) measure. For females, significant differences were found between the tasks only on WPM ( $t = -4.944, p < 0.05$ ) measure but not on SPM ( $t = -0.240, p > 0.05$ ) and SPS ( $t = -1.406, p > 0.05$ ) measures.



**Figure 1.** Rate of speech in males and females across tasks.

The results of the present study have revealed that the rate of speech in males is higher than females for job task, although it is statistically not significant. On reading task, gender effect is seen with higher rates for males than females. Overall rate is higher on job task compared to that of reading task in Nepali language and significant differences were observed. The results also revealed that the rate of speech and reading is similar to the other Indian languages such as Hindi and Punjabi.

### **Conclusion**

The present study results have provided normative values of rate of speech and reading in 20-30 year old Nepali speakers. The results showed that the rate of speech is higher in job task compared to reading task and significant gender differences were observed with higher rate of speech in males than females. However, as the number of subjects is less, the results cannot be generalized and future studies are required to study the rate of speech and reading in Nepali language across different age groups. Studies are also required to develop normative values across dialects of Nepali language which will be useful in clinical diagnosis of few of the speech and language disorders.

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**Bikash Duwal**

4<sup>th</sup> year BASLP

[dwlbks@gmail.com](mailto:dwlbks@gmail.com)

**Bishwajit Karki**

4<sup>th</sup> year BASLP

[bkarki\\_2007@yahoo.com](mailto:bkarki_2007@yahoo.com)

**Krupa Saira George (MASLP)**

Assistant Professor in Speech and Hearing

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[krupasairageorge@gmail.com](mailto:krupasairageorge@gmail.com)

**Dr. Sunil Kumar. Ravi**, Ph.D. (Speech Language Pathology)

*Corresponding Author*

Associate Professor & Principal

[rsunilkumar86@gmail.com](mailto:rsunilkumar86@gmail.com)

**Naseema Institute of Speech and Hearing**

**Bangalore 560095**

**Karnataka**

**India**

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