



The Impact of Multilingualism on Reading Fluency

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Abstract

Reading fluency is a task used to assess the reading percentage by measuring the rate of reading. The present study was conducted to examine the impact of multilingualism on reading fluency. Reading rates may differ between languages, hence this needed to be investigated. The study involved 30 healthy volunteers who were fluent in Telugu (L1), Hindi (L2), and English (L3). Each participant received three paragraphs with 130 words each to read aloud. Measurements included word count, duration and percentage. The findings revealed that L1 and L2 are not significantly different from one another, whereas L3 and L1 and L2 are significantly different from one another. According to the author, word length and structure affect duration differently across languages.

Keywords: Reading Fluency, Multilingualism, Reading Rate and Percentage; Telugu and Hindi

Introduction

Fluency has sometimes been viewed as essentially an oral reading phenomenon. The National Reading Panel defined reading fluency as "the ability to read text quickly, accurately, and with proper expression" [15]. Reading is very sophisticated structure and includes many skills that require simultaneous coordination to successfully complete many reading tasks [11]. The cognitive activities may differ in the amount of attention and effort that they require [18]. As a result of extensive practice and/or exposure, some operations require only minimal effort and are very fast, whereas others require considerable attention and are relatively slower. Rate is quite simply words read per minute. Rate of speech depends upon speaker and speaking situations. A slow rate of speech is usually less than 110 WPM, conversational rate of speech generally falls between 120 wpm at the slow end to 160 - 200 wpm in the fast range and the reading rate of speech is usually 150-160 wpm. Reading fluency encompasses accuracy, the speed or rate of reading, and the ability to read materials with expression and comprehension. Word Correct per minute (WCPM): It is a

standard procedure that measured by no. of words read per 1 minute or 3 minutes [5]. Such errors are considered like mispronunciations, substitutions, omissions, and words on which paused more than 3 seconds. Self-corrected errors, repeated words, and mispronunciations due to dialect or regional differences were not counted as errors. Interrater reliability was greater than 99%. [14] defined reading fluency as "the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading, such as decoding". [4] defined oral reading fluency as "the oral translation of the text with speed and accuracy". It often suggested reading fluency and comprehension are interrelated. Because reading comprehension demands considerable cognitive resources, which are of limited supply, it is likely that the rate at which words are recognized could influence comprehension. Beginning readers must allocate a large number of cognitive resources to the process of word recognition. [17] investigated to compare the rate of reading in Manipuri and Kannada language across gender. The results indicated that Kannada speakers read at a faster rate compared to Manipuri speakers and no gen-

der differences were observed. Oral reading fluency has tended to use measures of a word corrected per minute (WCPM) for assessment [4]. Prosody may provide a link between fluent verbal reading and comprehension [10]. [20] studied on oral reading fluency to reading comprehension in the native language (L1) and in English – a foreign language (L2). 50 university students respectively 22 students were Arabic and 28 students were Hebrew native speakers, read both L1 and English texts aloud and reported their comprehension online. Results showed that both scores of oral reading fluency and reading comprehension were higher in L1 than L2. [3] investigated the nature of language proficiency with one of the dominant language combinations (Hindi-English) in north India. A total of 85 bilingual Hindi (L1) and English (L2) adult speakers (age range 18-26years) and had at least 7 years of basic education included in this study. All the participants have examined their language skills across the spoken/understanding and reading/writing domains in Hindi (L1) and English (L2) languages, a combination which follows different patterns of acquisition and use. Results highlight the need for proficiency assessment for L1 and L2 language skills in view of the variability observed in the factor structure of the two languages. Self-reported information predicted objective performance for L2 but not L1. Greater interdependence of L1 and L2 was observed for the reading/writing domain as compared to the speaking/understanding domain. L1 is acquired and L2 is learned through instruction. In addition, the use of L1 is more in the spoken/understanding domain whereas the use of L2 is more in the reading/writing domain. While the primary bilingualism is defined as the simultaneous acquisition of more than one language during the first 5 years of life, those who exposed to the second language after school entry are called later bilingualism [21]. With increasing globalization, the no. of people using two or more languages i.e., bilingual individuals are also increasing. India being a multilingual country has an abundant bilingual/multilingual population with various permutations and combinations of the language paired [22]. The average range of reading aloud speed for subjects across 17 different languages was found to be 184 wpm, or 863 234 characters per minute. Even for languages that employ the Latin or Cyrillic alphabets, the amount of wpm differed between languages: it ranged from as low as 161-18 for Finnish to as high as 228-30 for English. This was a result of the fact that word lengths in various languages vary (longer words in such languages as Finnish and shorter words in English). The average character rate per minute for all the tested languages is 1000, nevertheless. [19] studied on Forty natives (L1) Bengali, (L2) English

speakers had studied English as a second language for a minimum of ten years) read speech data of “The North Wind and the Sun” was analysed to find out the phonetic and phonological problems of L1 Bengali speakers’ English speech and also find out how the variation is changed with L1 Bengali speakers’ English fluency level. During the study, automatic phoneme alignment was accomplished by the HTK tool with a modified TIMIT dictionary. The result showed that L1 Bengali speakers substitute new English consonant and vowel phonemes by Bengali sounds which are close to those English sounds. In the case of the phonological problem where it was shown that vowels are inserted by L1 Bengali speakers to break up consonant clusters or avoid syllable final coda consonant. [13] had done a study to know the effect of the bottom to top reading on reading fluency in Telugu speaker. A total of 10 females subjects were taken in this study in the age range of 17-22 years. All the subjects are normal in fluent speech and language skills without any abnormalities and Telugu is the primary language. All subjects were instructed to read the passage (consisted of 153 words) first in the bottom to the top procedure and second in the top to bottom in order to avoid the spontaneity of the reading order. The result found that the rate of speech is slow in bottom-up reading and hence the total duration taken for reading the passage is increased for all the participants. [2] investigated to check the reading fluency in persons with and without stuttering in both languages (Telugu, L1 and English, L2). A total number of 10 bilinguals’ males aged 21-27 years have participated. All the participants were divided into two groups, group (A) was consisted of 5 normal in fluent speech and language skills without any abnormalities and group (B) was consisted of 5 fluency disorder and they have diagnosed as moderate to severe stuttering. All the participants were given two passages including a rainbow passage for English and Telugu passage was taken from a newspaper consisting of 332 words. Subjects were instructed to read the passages normally. The sample was recorded by a voice recorder. The perceptual analysis was done on the words read correctly per minute and the percentage was calculated. The result has shown that the no. of words produced in a minute was shown in the native language when compared to the second language which clearly showed that the exposure to the L1 is less than L2. The native speakers (in both groups) show more fluent in the L2 (English) than the native language. This is due to the exposure of the second language is increased in daily lives than the native language. [16] done study to check the effect of reading fluency in bilingual (Bengali – English) persons with & without stuttering, results showed that reading fluency is better in

English (L₂) compared to Bengali (L₁) in both groups person without stuttering than person with stuttering. Decreased mean scores were observed in persons with severe stuttering and there is a high significant difference between severity of the stuttering. The difference between languages were showed like as the stuttering severity increases the reading fluency is decreased. There is a need of understanding the effect of multilingualism on reading fluency in typical individuals. Hence, the study was aimed to know the impact of bilingualism on reading fluency [1]. Speed isn't everything when it comes to reading fluency, but one-minute readings can be helpful when combined with a strong focus on reading comprehension. Reading comprehension can be improved by guiding students to read with expression.

Methods

Participants

A total number of 30 participants in the age range of 20 to 40 years were selected. All the participants are multilinguals who knows Telugu, Hindi and English speaking, reading and writing fluently. The participants who have normal speech and language skills without any health issues, neurocognitive disorders, oromotor structural abnormalities, or any other sensory deficits such as visual/hearing, native language should be Telugu (L1), second language Hindi (L2) and followed by English (L3) were included in the study.

Material

In the current study, test material includes a Standard English passage that is "The Grandfather" Passage similarly two passages were taken in Telugu and Hindi which consists of 130 words each. All the stimulus passages were represented by clear black and white printed hard copies.

Procedure

All the participants were given the three passages in Telugu, English and Hindi where the participants were instructed to read out the paragraphs aloud in each language separately and continuously without any pauses. The reading samples were recorded in a sound-treated room by using a PRAAT software version 6.2.13 in a Lenovo laptop and used for further analysis and scoring.

Dysfluencies (prolongations, repetitions, blocks, and words on which paused more than 3 seconds) were analysed perceptually

based on word corrected per minute (WCPM) procedure. It is a standard procedure that measured by the number of words read per 1minute. The perceptual analysis was done and calculate the words read correctly per minute and the total number of the word read per minute. The analysis was done in percentage by using the below formula.

Percentage formula

$$\frac{\text{No. of words read correctly per minute}}{\text{Total no. of words read per minute}} \times 100$$

Duration

The duration of each paragraph in various languages read by all the participants was calculated using the PRAAT software.

Statistical analysis

Statistical analysis was done by using SPSS 20.0 software. Mean and standard deviation were used to check the reading fluency in multilinguals, Telugu (L1), Hindi (L2), and English (L3). Independent sample t-test was used to compare reading fluency in between two groups i.e., the bilingual persons with and without stuttering. A paired t-test was used to compare the reading fluency between the languages, Telugu (L1), Hindi (L2), and English (L3).

Results

When the reading fluency was compared between the languages the percentage was occurred slightly similar in all the languages. On average L3 showed less duration (42 s). L3 (English) showed better performance than other languages. Errors such as repetitions, pauses, prolongations and mispronunciations were observed in L1 and L2 whereas only repetitions and pauses were seen in L3. The errors were reduced in L3 this could be due to the proficiency of language in daily usage. The whole data was given in the table 1.

Statistical analysis

Languages, duration, and percentages were all calculated, and the results showed that the mean and SD of percentage for L1 (Telugu) are 95.9% and 2.4%, L2 (Hindi) are 95% and 2.8%, and L3 (English) are 98% and 2.13%, respectively. Comparing L1 Duration to other languages, a higher mean was found (46.27); this could be attributed to the language's lack of use in reading-related features. L3 has 127 more words overall than L2, which may be a result of the latter language's simplicity. The data was given in table 2 and graph 1.

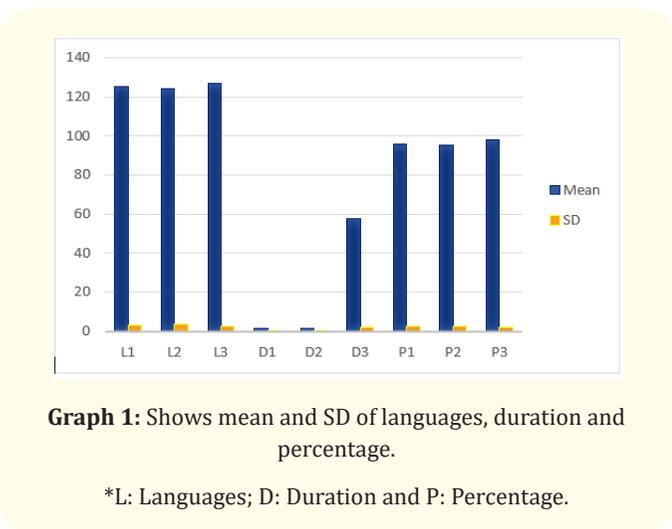
Speakers	Age	L1 (130)	%	Duration (mins)	L2 (130)	%	Duration (mins)	L3 (130)	%	Duration (Secs)
1	36	125	96	1.32	124	95	1.35	130	100	58
2	21	128	98	1.11	126	97	1.21	130	100	57
3	21	124	95	1.24	123	94	1.34	129	99	59
4	22	125	96	1.23	124	95	1.32	128	98	60
5	24	128	98	1.3	128	98	1.3	130	100	61
6	25	124	95	1.43	121	93	1	129	99	56
7	27	130	100	1.32	120	92	1.23	130	100	55
8	29	126	97	1.32	116	89	1.24	126	97	54
9	30	128	98	1.23	124	95	1.27	128	98	53
10	28	121	93	1.22	123	94	1.25	123	99	56
11	32	123	94	1.25	129	99	1.35	130	100	57
12	34	130	100	1.32	130	100	1.45	125	96	58
13	35	125	96	1.54	125	96	1.43	124	95	59
14	37	128	98	1.56	126	97	1.23	129	99	60
15	32	126	97	1.35	123	94	1.32	128	98	57
16	40	124	95	1.32	121	93	1.45	130	100	58
17	28	123	94	1.33	120	92	1.43	125	96	55
18	27	120	92	1.23	119	91	1.23	124	95	59
19	40	121	93	1.34	123	94	1.32	123	94	59
20	38	124	95	1.32	125	96	1.35	130	100	60
21	22	125	96	1.33	129	99	1.34	121	93	61
22	29	130	100	1.43	127	98	1.43	130	100	60
23	31	126	97	1.45	130	100	1.32	126	97	59
24	36	120	92	1.48	119	91	1.23	128	98	58
25	37	119	91	1.49	120	92	1.43	129	99	57
26	32	128	98	1	123	94	1.23	130	100	54
27	35	126	97	1.23	126	95	1.32	126	97	55
28	25	121	93	1.22	125	96	1.54	127	98	57
29	28	124	95	1.25	130	100	1.45	129	99	58
30	40	129	99	1.45	124	95	1.38	130	100	59
Total(Avg)	30.7	125	96	1.32	124	95	1.32	127	98	57.6

Table 1: Shows percentage and duration among the languages.

Speakers	Age	L1 (130)	%	Duration (Secs)	L2 (130)	%	Duration (Secs)	L3 (130)	%	Duration (Secs)
30	30.7	125 (3.14)	95.9 (2.4)	1.32 (.12)	124 (3.6)	95 (2.8)	1.32 (.10)	127 (2.6)	98 (1.99)	57.63 (2.14)

Table 2: Shows mean and SD of percentage and duration between the languages.

*% Percentage.



Pairs	Mean	SD	t	Sig.
Pair 1: L1-L2	.93	3.84	1.33	.194
Pair 2: L1-L3	-2.53	3.35	-4.14	.000**
Pair 3: L2-L3	-3.46	4.49	-4.22	.000**
Pair 4: L1P-L2P	.80	3.03	1.44	.159
Pair 5: L1P-L3P	-2.2	2.78	-4.32	.000**
Pair 6: L2P-L3P	-3.0	3.48	-4.71	.000**
Pair 7: L1D-L2D	-.004	.155	-.15	.880
Pair 8: L1D-L3D	-56.31	2.09	-147.1	.000**
Pair 9: L2D-L3D	-56.30	2.11	-145.6	.000**

Table 3: Mean and SD of overall words, duration and percentage.

Note: D: Duration and P: Percentage **p < 0.001

(High Significant).

A paired sample test was done, and the results showed that there is a no significant difference ($p > 0.05$) between L1-L2 in all the aspects such as no. of words, percentage and duration. L1-L3 and L2-L3 showed a high significant difference ($p < 0.001$) in all the aspects. All three languages have different word counts overall. This shows a significant difference between L3 (English) and L1 (Telugu) and L2 (Hindi). This may be a result of the non-native effect of languages. L3 uses a different pattern of language called SVO, but L1 and L2 use the same pattern of language called SOV (Subject Object Verb) (Subject Verb Object). The data was given in the table 3.

Discussion

Overall, the present study’s author stated that the duration varies across all languages, with L1 and L2 having longer words than L3, resulting in longer durations than L3. These findings concur with [22], which claims that the average word range varies across various languages, possibly as a result of the differences in word lengths in different languages (longer words in such languages as Finnish and shorter words in English). According to the current

study, English, an L3, performed better than L1 and L2. The L2 (English) performed better in this investigation, which is consistent with [16,17] as well. This might be as a result of the language’s proficiency, as L3 has been used more frequently in daily life than L1 and L2.

Conclusion

To summarise, the findings of the current study can help in the assessment and management of dyslexia and stuttering, where the percentage of reading fluency is useful in determining the simpler language to use for treatment. Given that L3 (English) performed better than L1 (Telugu) in the current study, it is preferable to choose a language that is spoken more frequently among multilingualists.

Limitations and Future Suggestions

The current study had a small sample size of 30 people and a restricted word range, but it might be expanded to include other languages, longer words, and disordered populations.

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Declaration of Competing Interest

The authors solely declare that there are no competing commercial or personal relationships which could influence the present paper.

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