



Original Research Article

A Disclosure of Reading Rate and Its Effect on Comprehension in Second Language Learning Context

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Article History: Submitted: 28 December 2018; accepted: 9 February 2018; published: 4 April 2018

ABSTRACT

In reading, it is vital for readers to develop decoding to the extent where each word is recognized automatically. Once this happens, they will have the necessary attention to focus on the sense or meaning of the text. This study investigated adult ESL learners' reading rate and its relationship with comprehension. This study also examined possible differences in the reading rate in terms of gender and academic semester. Its respondents were 210 Diploma students from one of the universities in Malaysia. Data were collected through Oral Reading Fluency (ORF) Assessment and Reading Comprehension Test. Jameson's Reading Rate Formula and Levels of Reading Rate for College Readers were used to examine respondents' reading rate. All data were coded and computer-scored using the Statistical Package for the Social Science (SPSS) programme. This study revealed that 106 respondents were Excellent College Readers while the rest ranged from Strong College Readers to Good General Readers. It was also discovered that females performed better than males in reading rate and Semester 3 respondents' reading rate was better than those in Semester 1. The correlation test indicated positive relationship between reading rate and comprehension.

Keywords: reading rate, comprehension; Oral Reading Fluency (ORF); reading rate formula; levels of reading rate for college readers

HOW TO CITE: Rawian, R., Mokhtar, A., & Yahaya, M. (2018). A Disclosure of Reading Rate and Its Effect on Comprehension in Second Language Learning Context. JEES (Journal of English Educators Society), 3(1), 1-12. doi:<http://dx.doi.org/10.21070/jees.v3i1.1274>

1. Introduction

Proficient readers have certain features in common; they not only read accurately, their recognition of words is automatic. In reading, an individual is required to perform at least two interdependent tasks; the reader must determine what words comprises the text

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Peer reviewed under responsibility of Universitas Muhammadiyah Sidoarjo.

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while simultaneously constructing meaning. As such, the greater the amount of attention is expended on decoding, the less that is available for comprehension. In order to ensure that readers have enough attention to understand texts adequately, it is vital for them to develop decoding to the extent where each word is recognized automatically. Once this happens, they will have the necessary attention to focus on the sense or meaning of the text. According to the automaticity theorists, the best way to ensure transition (the shift from decoding accurately to decoding automatically) is through extensive practice. As with any skill that requires an individual to coordinate a series of smaller actions to create a unified process, it is practice that allows the learner to develop expertise (Kuhn & Stahl, 2003). In terms of reading, this practice consists primarily in providing successive exposures to print. As letters, and later words, become increasingly familiar to the learner, less attention needs to be directed towards processing text at the orthographic level. This ability (to complete a process without conscious attention) fulfills LaBerge & Samuel's (1974) criterion for automaticity. The automaticity theory (AT) accounts for two components of fluent reading: accurate decoding at a sufficient rate. It further posits an explanation for automaticity's role in text comprehension (Kuhn & Stahl, 2003).

According to Stanovich's (1980) interactive-compensatory model, information from multiple sources can aid readers in their construction of meaning. This is true at each stage of development learners are presumed to make use of information from orthographic, phonological, semantic and syntactic sources. However, if a reader is less adept at gleaning information from one source, he may become over reliant on other sources. It follows that, until readers achieve automaticity in word recognition, they will necessarily depend more on alternative knowledge sources to make sense of what is being read.

In other words, they are more likely to rely on context as an aid to word recognition and comprehension than fluent readers (this refers to the use of context as an aid to identifying words in a child's lexicon, not to the use of context in learning new word meanings). Stanovich (1980) argues that automatic word recognition allows readers to concentrate on the meaning of text, rather than on identifying words. Hence, automatic word recognition allows a learner to focus contextual analysis on constructing meaning, rather than decoding (Adams, 1990).

The theory of automaticity in reading (AT) suggests that proficient word decoding occurs when readers move beyond conscious, accurate decoding to automatic, accurate decoding (LaBerge & Samuel, 1974; Stanovich, 1991; Samuels, 2002). At the automatic level, readers are able to decode words with minimal attention to the activity of decoding. Most adult readers are at this level of processing (Rasinski, 2004). They do not have to examine closely or sound out most of the words they encounter; they simply recognize the words instantly and accurately on sight. This type of processing frees the reader's conscious attention to comprehend or construct meaning from the text.

Carver (1990) states two types of Automaticity, (a) Unconscious Automaticity and (b) Conscious Automaticity. *Unconscious Automaticity* occurs when an individual undergoes actions through an automatic function, which is caused by the mind going off course. For instance, a person takes a shower and cannot remember if he has washed his hair. He ends up double washing because of a tangency in thought (Carver, 1990). *Unconscious Automaticity* does not help a reader, instead causes the reader to backtrack and reread the material and this leads to time loss. *Conscious Automaticity* is established when the habitual motion is consciously acknowledged and the process is unconsciously executed.

Most educators quantify reading rate in terms of reading speed – either the number of words read correctly per minute or the length of time it takes for a reader to complete a passage (Hudson, Lane & Pullen, 2005). Poor readers are often characterized by slow, laborious reading of connected text. Many fluency interventions focus on increasing reading rate, because slow reading can decrease comprehension (Mastropieri, Leinart & Scruggs 1999). Learners who read slowly often fail to complete their work, lose interest in school and seldom read for pleasure (Moats, 2001).

Effective reading rate results from the efficiency of decoding skills and comprehension (Greene, Kincade & Hays, 1994). Several hypotheses have explained decreased reading based on the assumption that word reading rate is a dependent variable. For example, it has been suggested that the level of word reading accuracy, the reader's age, the acquaintance with reading skills and development of word reading automaticity are all accountable for decreased reading rate (Biemiller, 1978; Carver, 1990; Gough & Tunmer, 1986).

Reading researchers agree that fluent reading is based primarily on the quality and rate of identification and recognition of the symbols and sounds of single and multi-letter units. In the regular development of reading fluency, research has clearly indicated a developmental trend in the speed at which letters and/or letter units are identified. The average time it takes to identify single letters in the English language is 3 seconds for kindergarten children, 800 ms at the beginning of the first grade, 600 ms at the end of the first grade, and about 100-200 ms less by the sixth grade (Stanovich, Nathan & Vala-Rossi, 1986; Sinatra & Royer, 1993; Compton & Carlisle, 1994). College students are able to identify letters within 50ms, which is about 500ms faster than children (Biemiller, 1978; Mason, 1982).

2. Methods

Quantitative and cross-sectional research approaches were used in this study. Respondents' reading rates were quantified using a systematic approach and Semester 1 and Semester 3 Diploma students were simultaneously examined. A total of 210 Diploma students were selected as the respondents of this study. Table 1 illustrated the distribution of the respondents based on gender and academic semester.

Table 1: Distribution of Respondents based on Gender and Academic Semester

Gender	Semester 1	Semester 3
Female	67	68
Male	38	37
Total	105	105

In the oral reading protocol, respondents were told that they were required to read an assigned text as natural as they could for 10 minutes. Since each of the reading would be tape-recorded, the participants were also reminded to read clearly and loudly. The researcher timed each reading and at the 10th minute, a participant would be told to stop his or her reading (if he or she was still reading the text).

After each reading, the researcher would listen to every recorded tape and evaluated the participant's reading by analyzing individual's reading errors as well as reading rate. *Mispronunciations, Substitutions, Reversals, Omissions, Unknown Words, Dropped Endings* and *Added Endings* were recorded as reading errors.

Reading Comprehension Assessment was conducted directly after each participant had finished reading the assigned text. In this assessment, each respondent had to answer 20 multiple-choice questions pertaining to the assigned text. A reliability test for this assessment was .90. Thirty minutes were allocated for each participant to complete the test.

The length of the selected reading text used in this study was about 1080 words. The text was ascertained using readability analysis - to examine its suitability to be used for university/college learners. The Dale-Chall Readability Formula (the revised version) and the Flesch Reading Ease Formula were used to ascertain the suitability of its selected reading text according to academic level. The McAlpine EFLAW Formula is later used to determine the ease of the selected reading English text for ESL learners. The readability analysis revealed that the selected text is suitable for university/college students.

Jameison's (2005) Reading Rate Formula was used in examining the participants' reading rate (automaticity). The reading rate was calculated based on the following procedure:

$$\frac{\text{Total number of words read MINUS number of errors}}{10 \text{ (reading time is 10 minutes)}} = \text{WRC/WPM/WCPM}$$

WRC/WPM/WCPM was proven, in both theoretical and empirical research, to be an accurate and powerful indicator of overall reading competence, especially in its strong correlation with comprehension (Hasbrouck & Tindal, 2006). The validity and reliability of these two measures were well established in a body of research extending over the past 25 years (Fuchs, Fuchs, Hosp & Jenkins, 2001; Shinn, 1998).

Each respondent's performance (WRC/WPM/WCPM) was analyzed and interpreted according to the adapted version of Jameison's (2005) Levels of Reading Rate for College

Readers. The original version of Jameison's (2005) Levels of Reading Rate for College Readers consisted of 8 levels of reading rate starting from the rate level of 160 WPM or less until the rate level of 1000 WPM or more. This original scale was based on a reading text that had 10,000 words. The present study adapted Jameison's (2005) Levels of Reading Rate for College Readers by sustaining the 8 levels of reading rate of the original version with some modifications on the ranges of WPM since the length of each reading texts used in the study was approximately 1,100 words.

The first rate level (0-16 WPM) indicated a reader as being very insufficient reader. The second level (17-29 WPM) indicated a reader being insufficient. The third level (30-42 WPM) described a reader as being average general reader but the reader was considered as being too slow for college reading. The fourth level (43-55 WPM) indicated a reader as being average college reader whereas the next level (56-68 WPM) described a reader as being good general reader (the minimum rate for effective college-reading). The following level (69-81 WPM) categorized a reader as a good college reader and the next level (82-94 WPM) indicated a reader as a strong college reader. The last category (95-107 WPM) indicated an excellent college reader. Score sheets for reading rate were used to record the respondents' performances.

3. Findings and Discussion

The participants' reading rate was analyzed based on four levels that were Good General Reader, Good College Reader, Strong College Reader and Excellent Reader. It was found that 50.5% (106) participants were excellent college readers while 43.8% (92) participants were strong college readers. Another 4.3% (9) participants were good college readers and only 1.4% (3) respondents were good general readers (Figure 1).

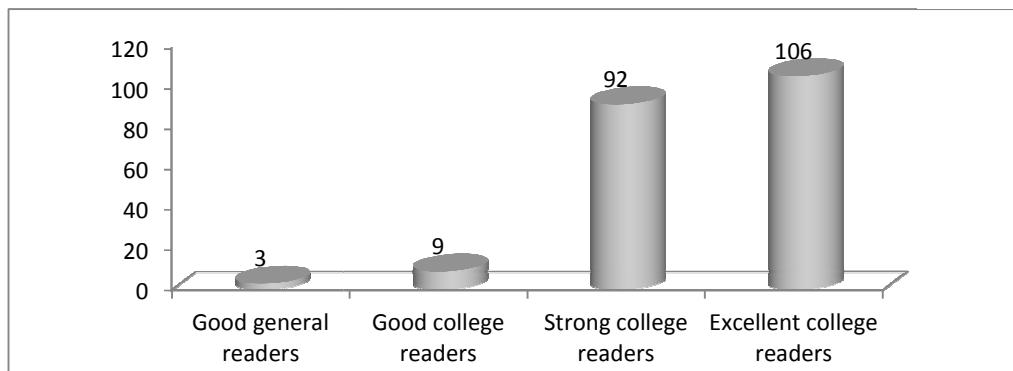


Figure 1: Levels of Participants' Reading Rate/Automaticity

Figure 2 illustrated that 29 (13.9%) males and 77 (36.7%) females were identified to be excellent college readers while another 31 (14.8%) males and 61 (29%) females were

recognized as strong college readers. The remaining 9 (4.2%) participants (4 males and 5 females) were good college readers and another 3 (1.4%) males were identified as good general readers.

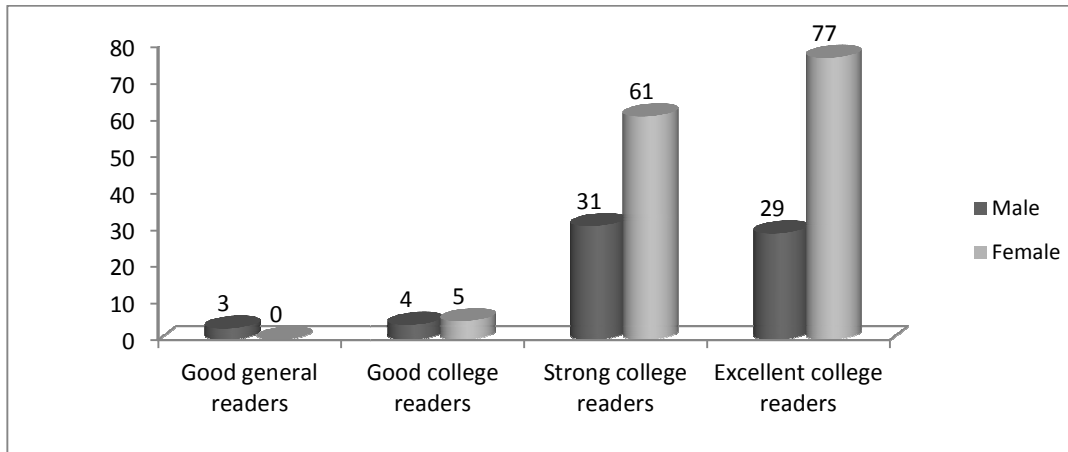


Figure 2: Levels of Participants' Reading Rate by Gender

t-test analyses were conducted in order to examine possible differences in the levels of reading rate in terms of gender.

Table 2 illustrated that there was a significant difference in the mean scores of reading rate/automaticity between male and female groups, $t(208) = -2.31$, $p = .02$ ($p < .05$). However, descriptive statistics showed that the females obtained a higher mean score ($\bar{x} = 7.50$, $SD = .77$) than the males ($\bar{x} = 7.28$, $SD = .56$). This finding revealed that the females had better reading rate than the males.

Table 2: Mean Scores and Standard Deviations of Reading Rate by Gender

Gender	n	Mean (\bar{x})	Std Deviation	<i>t</i>	df	Sig
Male	75	7.28	.56	-2.31	208	.02*
Female	105	7.50	.77			

* $p < .05$

As for the participants' performance according to their academic semester, Figure 3 showed that 45 (21.4%) Semester 1 participants and 61 (29%) Semester 3 participants were excellent college readers. However, the number of Semester 1 participants who were classified as strong college readers was greater than Semester 3 participants since 53 (25.2%) Semester 1 participants fell in this group compared to 39 (18.6%) Semester 3 participants. Besides that, 9 (4.3%) participants (6 Semester 1 participants and 3 Semester 3 participants)

were identified as good college readers while the remaining 3 (1.5%) participants (1 Semester 1 participant and 2 Semester 3 participants) were good general readers.

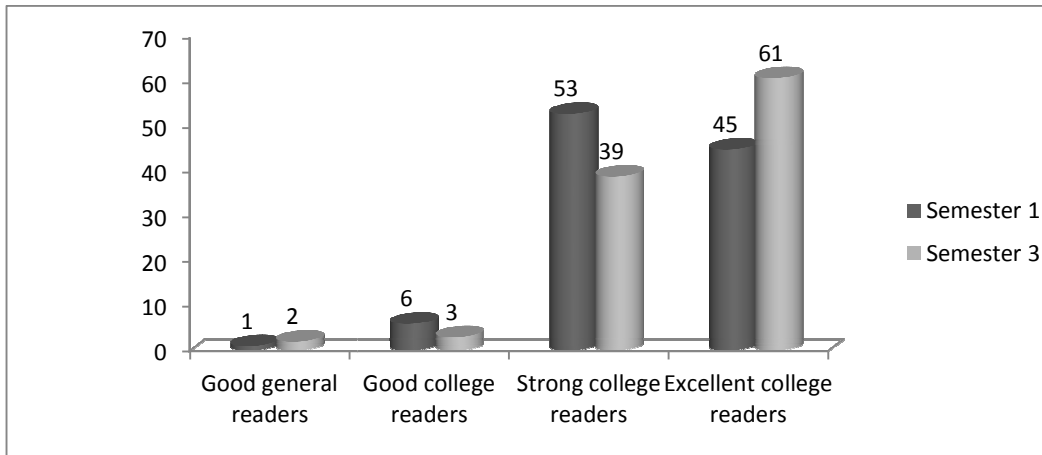


Figure 3: Levels of Participants' Reading Rate by Academic Semester

Table 3 showed that there was no significant difference in the mean scores of reading rate between Semester 1 and Semester 3, $t(208) = .831$, $p = .07$ ($p > .05$). The analysis revealed that Semester 3 participants had better reading rate than Semester 1 since the mean score for Semester 3 ($\bar{x} = 7.51$, $SD = .65$) was higher than the mean score for the Semester 1 ($\bar{x} = 7.35$, $SD = .63$).

Table 3: Mean Scores and Standard Deviations of Reading Rate by Academic Semester

Academic Semester	n	Mean (\bar{x})	Std Deviation	t	df	Sig
Semester 1	105	7.35	.63	.831	208	.07*
Semester 3	105	7.51	.65			

* $p > .05$

Table 4 further illustrated a correlation between reading rate and reading comprehension ($r = .64$).

Table 4: Correlation Score between Reading Rate and Reading Comprehension Abilities

	Reading Fluency	n	Reading Comprehension
Pearson correlation	Rate/Automaticity	210	.64*

* Correlation is significant at the 0.05 level (1-tailed)

Generally, the range of the respondents' reading rate was between Good General Readers to Excellent College Readers. One possible reason is due to the participants' degree of sensitivity to word formation (morphological awareness). According to Rasinski, Blachowicz and Lems (2006), morphology is one of the major sources of information when a reader comes across new or unknown information in a text. Some words are identified by their morphological structure; that is, word formation processes have an impact on printed word identification (Feldman, 1995). Snow et al. (1998) imply that morphology is essential, because it connects word forms and meanings within the structure of sentences. Research on the interface between reading and language development has shown that such metalinguistic awareness is crucial for reading fluency development (Biemiller, 1999; Menyuk, 1999).

Participants' discourse and syntactic awareness was another contributive factor to their reading rate. Discourse and syntactic awareness actually involves use of printed signals, like text structure, and written conventions that provide a pattern of how information is organized in a text, as well as how sentences are formed (Allington, 2001; Biemiller, 1999).

The influence of discourse and syntactic awareness was evidently proven by Mokhtari and Thompson (2006) who have investigated the influence of students' awareness of the structure of written language (syntactic awareness) on their ability to read fluently and to comprehend what they read. The results indicate that students' levels of syntactic awareness are significantly related to their reading fluency ($r = .625$) and reading comprehension ($r = .816$). These relationships suggest that lower levels of syntactic awareness can correspond to poor reading fluency and comprehension.

In addition, it was found that Semester 3 participants had better reading rate than Semester 1 participants. This might be due to more printed exposure received by Semester 3 participants compared to Semester 1 respondents throughout their academic years in the university. At tertiary level, readers are extensively exposed to variety and challenging reading materials and this extensive exposure helps greatly in enhancing readers' reading skills (Grabe, 2009). E-Reading material can be implemented (Hidayat, 2017) or kind of task such as Text Structure Tasks (Rohman, 2017). In addition, this finding is consistent with studies that conclude differences in reading rate based on academic grades. Studies that are designed to verify differences in the speed of letter identification between good and poor readers indicate that poor readers are about 300 ms slower than good readers in the first

grade, 200ms slower in grades three and four, 400ms slower in grades five and six, and about 100ms slower at college level (Mackworth & Mackworth, 1974). Similar results are obtained in studies measuring multi-letter speed of processing (Biemiller, 1978; Doehring, 1976; Frederiksen, Warren & Rosebery, 1985; Greene et al, 1994). Large increases in the speed at which one or more letters are identified to occur at the end of first grade. An asymptote in letter identification rate appears between the fifth and sixth grades. Differences between good and poor readers continue until college level (Breznitz, 2006; Greene et al, 1994).

Besides that, the significant correlation between reading rate and comprehension had evidently justified that reading rate did have some influence on the participants' comprehension. According to Samuel (2004, 2006) the role of reading rate or automatic word recognition is central to the construct of fluency and comprehension. Researchers concur that (1) reading rate is an essential component of proficient reading and is significantly correlated with word accuracy (Rasinski, 2000), and (2) that reading fluency and comprehension are closely associated with one another (Kuhn & Stahl, 2003). Nathan & Stanovich (1991) have found a high correlation between the speed and effort with reader's process text and text comprehension. When a reader battles with reading rate, it can negatively affect comprehension and motivation to read (Stanovich, 1991). In other words, decreased reading rate in word recognition leads to dysfluency in reading and to an unrewarding reading experience, which reduces involvement in text-related activities. In their study, Soto and Soto (1983) carry out a factor analysis on the components of reading and linguistic processing skills. They have discovered that fluency measured by rate in decoding meaningful and meaningless words is a distinct factor, which is highly important for comprehension.

4. Conclusion

In conclusion, the conducted study had highlighted valuable insights pertaining to ESL readers' reading rate. The present study has found some differences in students' reading rate in terms of their gender and academic semester. In short, it is hoped that educators could continue to update and enhance ESL students' existing competencies and expertise especially in reading area. Additional studies that gather valuable information on individuals' differences hold great promise in assisting educators to improve the quality of L2 teaching and learning process.

Acknowledgments

This article is based upon work supported by the University Grant awarded by Universiti Utara Malaysia (UUM), Malaysia, under Grant No: 13486.

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