The Interplay between Meta-cognitive Strategies and Reading Speed

Shen Wei[1, a, *]

[1]The Department of Foreign Languages of Northeast Electric Power University, Jilin, Jilin, China

[a]neduce@sina.com

*Corresponding author

Abstract. The aim of this study was to investigate the interplay between meta-cognitive strategies and reading speed in Chinese EFL learners. This paper employed the method of empirical research, and randomly selected 87 Chinese students from a university in Jilin province as the survey objects. 87 Chinese EFL learners aged from 19 to 22 years who were enrolled in the required English class participated in this study. Questionnaire related to students' meta-cognitive strategy was administered and a reading comprehension test was to evaluate students' reading speed. The correlation coefficient was used to analyze the data. Results have shown that there is a positive relationship between students' meta-cognitive strategy use and reading speed. In terms of meta-strategy categories, the three groups of reading speed showed the same priority of strategy use in the reading speed test. The findings indicate that the strategy use functions as the predictor of the learners' reading proficiency level.

1. Introduction

Meta-cognition is the knowledge of one's own cognitive processes (one's thinking) [1]. It is the ability to control thinking processes through various strategies, such as organizing, monitoring, and adapting. Meta-cognitive strategies are what one designs to monitor the progress related to learning, and tasks at hand. It is a mechanism for controlling thinking activities and ensuring it meeting one's goals [2]. Meta-cognitive strategies control the flow of information, monitor and guide the implementation of cognitive processes, including planning strategies, monitoring strategies (note strategies) and regulation strategies.

Reading speed is one key criterion of reading achievement. Increasing reading speed is also a tool for improving reading comprehension, and it may help empower and strengthen EFL learners' meta-cognitive awareness. Then, it can be expected that learners with more meta-cognitive strategies used are more likely to read fast and effectively.

Therefore, the present study was aimed at examining whether reading speed is influenced by meta-cognitive strategies in Chinese EFL learners, and also how the effectiveness of meta-cognitive strategies weigh in Chinese EFL learners' reading speed.

2. Literature review

Research has found that readers with varying reading skills use different reading strategies [3]. These strategies tend to be similar when reading in one's native (L1) and foreign languages (L2), but preliminary research has found that one's awareness of using these strategies may differ across languages [4]. This type of awareness is often referred to as meta-cognition, the thinking of one's thinking throughout the reading process [5], and is a documented aspect of reading success among bilingual students [6]. Other studies also show that meta-cognitive strategies can help with reading [7]. Furthermore, those who use meta-cognitive strategies have higher rates of recall and spend less time reviewing [8].

Quite a few studies have found that individual differences in meta-cognitive and reading speed in Chinese EFL learners. The present study aimed to explore the role of meta-cognitive strategies in

reading achievement. It further aimed to investigate the correlations among meta-cognitive strategies and reading speed. More specifically, the study sought to answer the following research questions:

1. What is the condition of meta-cognitive strategy use in Chinese EFL learners?

2. What are the differences of meta-cognitive strategy categories use among different proficiency level?

3. Are meta-cognitive strategies significantly related to reading speed?

3. Method

3.1 Participants

Participants in the study were 87 university students from four intact classes of a university located in Jilin Province, China. All were sophomores who enrolled in English course as a compulsory subject.

3.2 Materials

The materials prepared for this study included the Meta-cognitive Awareness of Reading Strategy Inventory questionnaire consisting of 30 items that measure three factors: Global Reading Strategies, Problem-Solving Strategies, and Support Reading Strategies (MARSI) [9], and a reading speed test called "Asian and Pacific Speed Readings for ESL Learners" [10].

3.3 Procedures

At the first period, two readings (pencil and paper test) from Asian and Pacific Speed Readings for ESL Learners [10] were distributed to participants. The first passage was not used for measuring reading speed in this study, which is for the exercise and helped participants get familiar with the test. The second passage was scored and analyzed by the researcher. Right after they finished the reading speed test, the participants were presented in the meta-cognitive strategies questionnaire which lasted approximately ten to fifteen minutes.

3.4 Scoring

With regard to the reading speed test, one point was awarded to each correct answer for a total of 10, no point for an incorrect answer. For meta-cognitive strategy questionnaire, which is in a five-point Likert scale ranging from always or almost true to never or almost never true. The point was calculated for each item by the scale the participant chose.

3.5 Data analysis

The reliability of the Meta-cognitive Awareness Reading Strategy Inventory (MARSI) was measured using Cronbach's alpha. The result of the Cronbach's alpha was .868. Descriptive statistical analysis and a Pearson correlation was conducted for reading speed and meta-cognitive strategies. Statistical data analysis was conducted by SPSS 21.0 for Windows.

4. Results and Discussion

4.1 Meta-cognitive categories use among groups by proficiency level

Table 1 demonstrated that the high level students used meta-strategies more frequently than the middle and low level students did. In terms of each category use, the students in this study, regardless of differences in their proficiency level, used global reading strategies (GLOB), problem-solving strategies (PROB) more frequently than support reading strategies (SUB), as seen in Table 2. The results show that participants' use of meta-cognitive strategies have a significant relationship with their reading speed proficiency.

Table 1. Descriptive statistics of meta-cognitive strategy categories and reading speed

Reading speed level	Mean		
	GLOB	PROB	SUB
High	3.16	3.19	3.02
Midddle	3.04	3.13	2.91
Low	2.78	2.83	2.27
Total	3.02	3.08	2.80

Note: global reading strategies (GLOB), problem-solving strategies (PROB), support reading strategies (SUB)

Table 2. Ranking profile for categories by proficiency level

Ranking	High level	Mid level	Low level
1	PROB	PROB	PROB
2	GLOB	GLOB	GLOB
3	SUP	SUP	SUP

Note: global reading strategies (GLOB), problem-solving strategies (PROB), support reading strategies (SUB)

4.2 Correlation between meta-cognitive strategy and reading speed

It was found that there are significant correlations among three meta-cognitive strategies. The correlations between the three reading meta-cognitive and reading comprehension speed are significant as well (see Table 3). The Pearson correlation between global reading strategies (GLOB) and reading speed test score (RST) is .203; between problem-solving strategies (PROB) and reading speed test score (RST) is .214; between support reading strategies (SUB) and reading speed test score (RST) is .405.

Table 3. Pearson Correlations among Meta-cognitive Strategy Categories and Reading Speed

	GLOB	PROB	SUB	MARSI	RST
GLOB	1	.734**	.658**	.249	.203
PROB	.734**	1	.617**	.303	.214
SUB	.658**	.617**	1	.328	.405*
MARSI	.249	.303	.328	1	.212
RST	.203	.214	.405*	.212	1

Note: global reading strategies (GLOB), problem-solving strategies (PROB), support reading strategies (SUB), Meta-cognitive Awareness Reading Strategy Inventory (MARSI), reading speed test score (RST).

The analysis showed that there were more significant differences among groups in support reading strategies (SUB) than global reading strategies (GLOB), and problem-solving strategies (PROB), as seen in Table 3. Based on the results, it can be assumed that learner's support factor has more influence than problem-solving factor and global factor do in reading speed test.

5. Conclusion

This study aimed to examine the interplay between meta-cognitive strategy and reading speed and yielded the following major findings: First, there was a positive relationship between students' meta-cognitive strategy use and reading speed. Second, there was a big difference in reading speed. The minimum score of reading speed test among participants in this study is 1 out of 10, while the maximum is 10. In terms of meta-strategy categories, the three groups of reading speed showed the same priority of strategy use in the reading speed test. Third, the participants' reading speed is positively correlated with their strategy use. The findings indicate that the strategy use functions as the predictor of the learners' reading proficiency level.

In terms of pedagogy, the present study suggests the ability to efficiently utilize meta-cognitive strategies may help learners engage in reading more actively and teaching these strategies is an essential element to be incorporated into the curriculum. Among the three categories of meta-cognitive strategies, the support reading strategies need more emphasis and practice. Teachers can guide students how to take notes and consult a dictionary effectively while reading. In addition, it raises the awareness about the usefulness of meta-cognitive strategies in fast reading process, the teachers need to make more effort on those cognitive factors in EFL teaching and learning. Teachers'

understanding of the meta-cognitive strategies of reading and learner's academic achievement is absolutely necessary. Therefore, in English teaching, teachers need to provide students with various well-designed types of meta-cognitive strategies, while students should have an ample opportunity to experience those strategies provided by teachers.

The current study also has some limitations. One limitation is that the number of participants in the current study is not sufficient enough to confirm a generalized conclusion. Another limitation is that the reading speed test scores. It would be beneficial if future research could apply various reading speed test formats to measure more diverse aspects of reading proficiency. It is still necessary to conduct in-depth research on the factors that affect students' reading performance.

References

[1] Flavell J. H. Metacognition and cognitive mnitoring: A new area of cognitive developmental inquiry, *American Psychologist*, vol. 15, pp. 906 -911, 1979.

[2] Bruner, J. S., Goodnow, J.J. Austin, G. A. *A study of thinking*. New York: Wiley, 1956.

[3] Paris, S. G., & Winograd, P. *How metacognition can promote academic learning and instruction*. In B. F. Jones & L. Idol (Eds.), Dimensions of thinking and cognitive instruction (pp. 15-51). Hillsdale, NJ: Lawrence Erlbaum Associates, 1990.

[4] Anderson, N. J. *Practical English language teaching: Reading*. New York: McGraw Hill, 2008.

[5] Flavell, J. H. *Monitoring social cognitive enterprises: Something else that may develop in the area of social cognition*. In J. H. Flavell & L. Ross (Eds.), Social cognitive development: Frontiers and possible futures (pp. 272-287). New York: University Press, 1981.

[6] Hyte, H. *Optimal silent and oral reading rates for reading fluency: Graded reading levels*. A Reading Horizon Post. Retrieved from http://www.readinghorizons.com/blog/author/Heidi.aspx, 2010.

[7] Dabarera, C., Renandya, W. A., & Zhang, L. J. The impact of metacognitive scaffolding and monitoring on reading comprehension. *System*, vol. 42, pp. 462-473, 2014.

[8] Leopold, C., & Leutner, D. Improving students' science text comprehension through metacognitive self-regulation when applying learning strategies. Metacognition and Learning, vol. 10, pp. 313-346, 2015.

[9] Mokhtari, K., & Reichard, C.A. Investigating the strategic reading processes of first and second language readers in two different cultural contexts. *System*, vol. 32, pp. 379-394, 2004.

[10] Quinn, E., Nation, I.S.P., & Millett, S. Asian and Pacific speed readings for ESL learners. Retrieved from https://www.victoria.ac.nz/lals/staff/Publications/paul-nation/Speed-reading, 2007.