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A brief review of the effect of reading strategy instruction on L2 reading comprehension: A discussion of types, amount, L2 proficiency, and age

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Abstract
L2 reading, as a dominant source of language input, is an essential skill contributing to language learners' academic success across various educational contexts. The process of teaching that strategy is reading strategy instruction (RSI). A considerable amount of literature has provided important information on the effect of RSI on improving L2 reading. This article briefly reviews the effect of reading strategy instruction on L2 reading comprehension from the perspective of the types and amount of RSI, L2 proficiency, and age.

Keywords reading strategy instruction; L2 reading comprehension; L2 proficiency; age

1. Introduction

L2 reading, as a dominant source of language input, is an essential skill contributing to language learners' academic success across various educational contexts. While reading, reading strategies are usually employed. A reading strategy is a behavioral action taken under certain contextual conditions to optimize the results in a reading activity (McNamara, 2007). For instance, when learners encounter an unfamiliar word with low frequency in a reading text, teachers may instruct them to take action to locate the word in a dictionary and take back the most accurate explanation to re-comprehend the sentence. The process of teaching that strategy is reading strategy instruction (RSI). In other words, RSI can be defined as techniques that are explicitly taught to L2 learners, aiming to improve their L2 reading comprehension (Chamot, 2001; O'Malley & Chamot, 1990; Oxford, 1990). When opening an L2 textbook, especially those at the beginning and intermediate levels, one can easily access various reading strategies for L2 reading improvement. Most of those RSI is designed to facilitate learners' reading process so that they can be empowered to become autonomous readers who regard reading as a means of expanding L2 input sources (Taylor et al., 2006).

A considerable amount of literature has provided important information on the effect of RSI on improving L2 reading (e.g., Brevik, 2019; Evans, 2002; Kavani & Amjadiparvar, 2018; McNamara, 2007; Wu et al., 2021; Zhang, 2017). Studies such as that conducted by Taylor et al. (2006) claimed that RSI is useful for L2 reading improvement at a certain degree of confidence. Their meta-analysis of 23 unique sample studies indicated that 68% of the participants who received RSI outperformed those who did not receive such instructions in L2 reading, with an observed medium effect size of .54 as in Hedges g (p = .00). Similarly, Maeng (2014), in another meta-analysis of 37 studies, demonstrated that RSI is effective in improving the reading comprehension of Korean L2 learners. However, as those authors have also suggested, the relationship, be it correlational or causal, between the RSI implementation and L2 reading improvement must be interpreted with caution because multiple moderating variables might have influenced the efficacy of RSI. A moderating variable, or a moderator, refers to anything that can affect the dependent variables (Dodge et al., 2006)—the outcomes of RSI, such as reading strategy use and L2 reading performance. Those moderating variables may include types of RSI, learners' L2 proficiency, and learners' age. This essay evaluates the factors that might affect RSI efficacy by drawing on relevant empirical research, ending with a discussion of pedagogical implications.

In order to determine possible factors that may affect RSI efficacy, this essay is interested in experimental and quasi-experimental studies where action-oriented, proactive assistance, explicit RSIs were given to targeted subjects during interventions, and outcomes were objectively measured. The explicitness of RSI is emphasized because learners' achievements could be more conveniently traced back and measured by this kind of intervention. Furthermore, the adoption of intervention is another inclusion criterion for this essay, as intervention under controlled circumstances is the premise of examining the efficacy of an approach (Ernst & Pittler, 2006; Ye, 2014).

2. Possible Factors that Affect RSI Efficacy

2.1. Types of RSI

Reading strategies can be categorized into cognitive and metacognitive (Maeng, 2014; Taylor et al., 2006). Cognitive strategies are those that L2 readers directly employ in reading texts, making the reading process more efficient, such as graphic organizers, mind mapping, and questioning strategies (Wright & Brown, 2006). Metacognitive strategies are those igniting L2 readers to reflect upon their reading process, such as planning, monitoring, and reviewing (Anderson, 2002; Taylor et al., 2006).

As reported in previous literature, different types of RSI have different effects on L2 reading. Aghaie and Zhang (2012), in a quasi-experimental study, compared the impact of metacognitive and cognitive strategy on L2 reading. They gave a 48-hour RSI to 80 Iranian intermediate-level EFL college students (40 in the treatment group and 40 in the control group). A five-point Likert scale questionnaire derived from Chamot and O'Malley (1994) collected reading strategy uses. Think-aloud protocols served as a descriptor of reading strategy transfer ability (the ability to transfer strategy across learning tasks and situations). The *New Interchange 3* test measured L2 reading achievements in the pretest and posttest. An independent *t*-test showed that compared with the pretest, the increase of the treatment group's reading strategy transfer ability, perceived strategy use, and L2 reading achievements in the posttest was significant, while there were no significant differences in the control group. In addition, the results indicated that metacognitive strategies transferred better than cognitive strategies among the participants in the treatment group. As can be seen, RSI contributes to L2 reading improvement, and metacognitive strategies seem to be more beneficial to L2 reading.

This study is a good example of comparing the efficacy of cognitive and metacognitive strategy instruction with a solid theoretical basis and transparent research procedures, but some aspects may influence its reliability. To illustrate, using a test from the textbook is risky because students may preview chapters ahead of time. Additionally, the author did not imply the attribute of the test, such as standardization, difficulty levels, and question types, thus decreasing the credibility of the data collection. Another uncertainty is caused by the lack of information regarding how long each type of reading strategy was taught, as longer instruction may lead to learners' more dexterous strategy application, thus impacting the measurement of L2 reading performance. Above all, a replication of this study is highly encouraged after those weaknesses are improved.

Furthermore, Plonsky (2011), in a meta-analysis that synthesized 61 primary studies, claimed that metacognitive strategy instruction is more effective than cognitive strategy instruction in RSI. Maeng (2014) echoed his statement and further proposed that an RSI combining cognitive and metacognitive reading strategies is more effective than mere metacognitive strategy instruction. More interestingly, Maeng argued that RSI integrating five or fewer strategies was found to have a more substantial effect than that incorporating more than five strategies. As a matter of fact, the treatment duration in most studies was one semester or shorter. If the teacher decided to instruct an excessive number of reading strategies in a limited time, learners might not have sufficient time to digest and practice, thus negatively affecting their L2 reading development. Moreover, Zhang (2017) investigated how reading strategies were applied in China's College English Test Band 4 (CET-4) among 584 Chinese EFL college students and concluded that both cognitive and metacognitive reading strategies are efficacious in L2 reading, but metacognitive reading strategies are more effective than cognitive reading strategies in L2 learners' reading performance. This is probably because metacognitive strategies facilitated the users' test management in such a standardized and challenging test.

In brief, the types of RSI can be a moderator between RSI and L2 reading. Metacognitive strategy instructions seem to be more efficacious than cognitive strategy instructions for L2 reading improvement. Also, longer interventions focusing on a few reading strategies are more advantageous than cooperating a wide range of strategies in a time-limited treatment.

2.2. L2 proficiency

L2 proficiency seems to be another factor that may affect RSI efficacy. As a typical example, Akkakoson (2013), in a quasi-experimental study, investigated the relationship between RSI and L2 reading achievements among 164 participants (82 in the experimental cohort and 82 in the control cohort) at a Thai university. The study adopted a pretest-treatment-posttest design. The pretest and posttest employed the Nelson-Denny Reading Test (NDRT), a standardized test to examine participants' L2 proficiency. The experiment cohort received a 14-week strategy-based treatment. A portfolio approach examined the experimental cohort's use of reading strategies. Results showed that the experiment cohort outperformed the control cohort in

the posttest. Moreover, learners with higher L2 proficiency in the experiment cohort outperformed their peers with lower L2 proficiency. In other words, this study seems to have provided convincing evidence that RSI intervention is efficacious for improving Thai L2 learners' reading, and L2 proficiency could be a moderating variable making the relationship between RSI and L2 reading outcomes stronger.

However, two conspicuous shortcomings in the data collection cannot be neglected. First, NDRT is probably not an ideal test measurement for L2 proficiency. Duffy et al. (1986) criticized that NDRT is much too difficult for entry-level L2 learners, thus reducing the content validity. Second, even though the self-reported portfolio approach of strategy use was practical and convenient for data collection, the self-reported data might have low credibility in reflecting the actual adoption of reading strategy use and whether they were applied appropriately. Anyway, although the operationalization of L2 proficiency and reading strategy uses greatly decreased its reliability, this study is a commendable attempt in exploring the moderating effect of L2 proficiency.

Despite the weaknesses, Akkakoson (2013) corroborates the viewpoint of Prichard (2014) that L2 proficiency level is a potentially influential moderating variable between RSI and L2 reading. Prichard (2014) divided 447 first-year non-English major Japanese EFL learners into three proficiency groups (top 20%, intermediate 60%, and bottom 20%) according to their performance in the TOEIC Reading section. Then, a 15-week RSI and posttest were given. Results indicated that RSI effectively enhanced L2 reading among the three groups, and more-proficient readers employed a broader range of reading strategies. Moreover, Taylor et al. (2006) maintained that L2 learners might need to have reached a certain level of L2 competence (e.g., by learning for at least one year or reaching the 3,000-word level) before RSI can make a difference. Specifically, studies whose participants had learned English for two years, and three years and beyond demonstrated medium effect sizes of RSI (Hedges g = .63 and .61, p = .00), while those whose participants had learned English for one year or less resulted in a negligible effect size (Hedges g = .12, p = .00). Plonsky (2011) has also found that intermediate and advanced L2 learners tend to use more reading strategies and use them more effectively than beginners. As such, L2 proficiency could be a positive moderator between RSI and L2 reading, meaning that RSI may exert a better effect on more proficient L2 readers. Again, this viewpoint should be interpreted with caution, as different operationalization of L2 proficiency may affect the association between RSI and L2 reading performance.

2.3. Age

Very little primary research has been conducted to investigate the role of age in RSI, probably because it is pedagogically and unethically to instruct the same reading strategies to learners at different ages with massively discrepant cognition development. Therefore, this section cites and discusses the findings from secondary sources, such as meta-analysis.

Previous research has shown that age plays an essential role in the efficacy of RSI on L2 reading. Some proposed that age is a positive moderator between RSI and L2 reading, meaning that older learners seem to have obtained better reading achievements through RSI than younger learners. Taylor et al. (2006) reported that RSI was more efficacious in the 12-18-year-old group and the over-18-year-old group with medium effect sizes (Hedges g = .51 and .52, p = .00) than in the 0-12-year-old with a negligible effect size (Hedges g = .12, p = .00). These differences might result from the differences in language competency and the stages of learning (kindergarten, primary school, secondary school, and tertiary school). After all, older students are considered more cognitively developed than younger students (Park, 2010). Park's (2010) meta-analysis also supports that age may be a positive moderator between RSI and L2 reading performance. After reviewing 20 studies, he concluded that RSI is more efficacious for reading performance improvement among post-secondary L2 learners (r = .41, p = .00) than secondary L2 learners (r = .11, p = .00). Beyond that, this result comes as a boost for older learners. They may have passed their critical period (e.g., 2 to 13 years old as suggested by Loewen and Reinders (2011)) and thus are regarded as disadvantageous learners in second language acquisition. However, Taylor's and Park's findings ascertain that L2 reading strategies seem to be more accessible to learners over 12 years old.

Still, this account must be approached with some caution because it may be confounded by participant variables such as cognition development and language competency. To illustrate, to investigate the role of age in RSI, a researcher must set RSI as a control variable. However, it may be inappropriate to ask a pre-school learner to reflect upon metacognitive strategy use since most of them do not even master enough cognitive strategies. Therefore, the conclusion that age has a moderating effect between RSI and L2 reading can only be considered tentative, and more primary data sources from empirical studies are required.

3. Conclusion

The abovementioned studies confirm that RSI is beneficial to L2 reading performance. Three variables are detected to have moderating effects on the relationship between RSI and L2 reading. First, the types of RSI may affect the relationship between RSI and L2 reading, and metacognitive RSI is considered more efficacious than cognitive RSI for L2 reading improvement. It is also worth mentioning that a combination of both can be more efficacious than only instructing either of them. Regarding the recommended amount of RSI, less is more; that is, learners' longer exposure to a few reading strategies is more efficacious

than being crammed with many various strategies. Second, L2 proficiency may positively moderate RSI and L2 reading. More proficient L2 readers are found to be more effective reading strategy users than less proficient L2 readers. However, it is also important to bear in mind that some experimental variables, such as the operationalization of L2 proficiency, may impact a study's reliability. Third, it can be seen from secondary sources that age can be another positive moderator between RSI and L2 reading. Older learners are found to be more effective strategy receivers and users than younger learners due to their cognitive development and language competence. Nonetheless, more primary research is wanted to reduce the influence of confounding variables, such as learners' cognitive development and language competence.

Some pedagogical implications can be drawn to inform appropriate RSI practice. On the one hand, language teachers should realize those important variables may impact the efficacy of RSI on L2 reading achievements. RSI should be customized to learners' L2 proficiency, age, and cognitive development level in teaching practice. It is highly advised that a balanced, goal-oriented inclusion of RSI should be given, although metacognitive RSI is found to be more efficacious. Teachers should take into consideration teaching aims, students' current proficiency, and students' needs when designing an RSI program. On the other hand, as Chamot and O'Malley (1994) suggested, strategy instruction is most efficacious when fewer strategies are employed more frequently. When selecting reading strategies for instruction, teachers should carefully consider the number of reading strategies, as more types of reading strategies mean that the teaching time allocated to each strategy and the time for learners to practice will be limited. Thus, more protracted intervention of selected reading strategies may bring out learners' better learning experience.

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