



Transitional Shift of Metacognitive Awareness of Reading Strategy along with L2-English Reading Proficiency

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ABSTRACT

Low-proficient L2 readers, especially, struggle for literal understanding of the text and for appropriately using reading strategy (RS). We examined whether and how the development of L2-English reading comprehension skills is associated with the frequency and kinds of L2 RS use. Fifty Japanese learners of English completed a reading comprehension test, single sentence reading task to measure reading fluency, and a questionnaire on their metacognitive awareness of reading strategy. A hierarchical cluster analysis was applied to classify the participants into subgroups and identify group-specific characteristics. Three subgroups identified through the analysis showed that the participants in cluster 3 who obtained the lowest reading comprehension test scores reported using RSs as widely and frequently as the participants in cluster 1 who had the highest reading comprehension test scores. Interestingly, the participants who had mid-level reading comprehension test scores (cluster 2) reported the least number of RSs. Non-significant differences in reading fluency between the participants of cluster 2 and 3 suggest the existence of qualitative difference in RS use. Findings suggest the possibility of L2 readers exhibiting appropriate RS use after undergoing a series of restructuring or U-shaped process of overusing and then disusing RSs. Limitations and educational implications were also discussed.

INTRODUCTION

Reading strategy (RS) is the action readers take to support their comprehension process. Although researchers' opinions vary, RS is conceptually divided into higher-level text processing strategies (e.g., schema-based knowledge and prediction, cf. Anderson & Pearson, 1984), lower-level text processing strategies (e.g., decoding, and lexical and grammatical knowledge, cf. van Dijk & Kintsch, 1983), and comprehension monitoring strategies (e.g., reading speed adjustment, underlining, and paraphrasing, see e.g., Block, 1992).

Research on second language (L2) reading primarily includes classification of RS usage pattern by readers with different L2 reading proficiencies (e.g., Anderson, 1991; Carrell, 1989; Karimi, 2015; Mokhtari & Sheorey, 2002; Yamashita, 2002). Effective RS use hinges on readers' self-awareness of their own reading and comprehension process; besides, one's L2 proficiency also plays a role in cognitive control during reading (e.g., Anderson, 1991; Cartwright, 2015;

Sheorey & Mokhtari, 2001; Zhang, 2001). Highly proficient readers are more likely to select optimal RSs from a range of RS choices for deep and active comprehension of text. On the other hand, low-proficiency readers are restricted to lower-level processing strategies because their cognitive resources are consumed in the literal comprehension of the text (Anderson, 1991; Block, 1992; Carrell, 1989; Yamashita, 2002, see the linguistic threshold hypothesis, Bernhardt & Kamil, 1991; Clarke, 1979). A think-aloud study by Yamashita (2002) found that proficient L2 readers reported to have assigned their attention to inter-sentential level RSs including inferring and integrating text information, while the less proficient group reported employing sentence-level RSs, such as paraphrasing, rereading, and translation. A questionnaire study by Sheorey and Mokhtari (2001) showed similar results, wherein the higher proficiency group used a larger variety of RSs including text previewing, reading rate adjustment, and concentration management, while the lower proficiency group used RSs that focused more on comprehension aid (using dictionaries, taking notes, and underlining).

Other researchers have studied the effects of readers' L1 language abilities, transfer of L1 RS, L2 learning/L1 cultural background, and readers' emotions toward reading on the usage pattern of RS during L2 reading (Block, 1986; Karbalaei, 2010; Taki, 2016; Upton & Lee-Thompson, 2001). This line of research argues that the RS choice by individuals varies and cannot be explained only by "the linguistic threshold hypothesis," which posits that a certain level of L2 proficiency allows access to the skills obtained through L1 acquisition during L2 reading (Bernhardt & Kamil, 1991; Clarke, 1979). For example, L2 readers apply their reliable L1 RS into L2 reading even though it is functionally ineffective (Erler & Finkbeiner, 2007; Macaro, 2001). Upton and Lee-Thompson (2001) examined the role of L1 language during L2 reading using think-aloud protocols and retrospective interviews and found that less proficient L2 readers relied more on their L1 translation for constructing and confirming the meaning of L2 text than did proficient L2 readers, which is in line with the linguistic threshold hypothesis. However, Upton and Lee-Thompson also revealed that none of the participants showed any signs of text evaluation strategies (i.e., approving/disapproving the text content and arguing), which are more related to higher-level text processing strategies, during think-aloud protocols, although the highly proficient group is considered to use them more according to the hypothesis. They explain that participants' L2 reading behavior is reflected by their approach to L1 reading; less experience in using such strategies in L1 reading may shape their L2 strategy use (Taki, 2016; Upton & Lee-Thompson, 2001). Finkbeiner (2006) reports that readers' interest in reading itself determines how deeply they connect their knowledge to the text for their comprehension process ("personal elaboration strategies" in his term).

Although the possible differences in participants' L2 reading proficiency prevent a direct comparison of previous research findings, a larger variety and more frequent use of RS is observed among proficient readers compared to less proficient readers (Anderson, 1991; Block, 1992; Carrell, 1989; Yamashita, 2002). Nonetheless, it is also true that non-linguistic and individual-related variables are deeply involved in the RS selection process. The indication of the latter case that L2 reading proficiency may not always be associated directly with the observable RS use accords with, in a way, the complexity of language development in past tense acquisition. In acquiring past tense verbs, learners do not exhibit proper and stable language use until they first exhibit (e.g., went) and then fail (e.g., goed) it (e.g., Kellerman, 1985; Stemberger, 1994). Instead of being linear in nature, learners' progress can be complex and U-shaped (Kellerman, 1985).

Similarly, acquisition and use of L2 RSs may also be complex and non-linear in nature. Nevertheless, the transitional shift of RS use among L2 readers remains unclear, and thus the

present study seeks to examine and identify the RSs among L2 readers with different levels of L2 reading proficiency. The role of reading fluency (accuracy and speed) in RS selection is also investigated, as it explains individual differences in lower-level processing efficiency (Nassaji, 2014). Fluent readers process lower-level text information with less cognitive effort, which then enables them to focus on deeper and higher text processing using higher-level text processing strategies. We examine whether and how reading fluency reflects readers' selection of RS in reading.

METHODOLOGY

Participants

Fifty L1-Japanese undergraduate and graduate students (ages 18–26 with the mode 19, 19 males, 31 females) in Japan participated in the study for a fixed remuneration. They had received formal EFL instruction for at least six years in school. Three of them had more than one year of experience studying abroad in English-speaking countries and were excluded from data analysis. They were considered (upper-) intermediate-level English learners according to their TOEFL ITP score ($M = 532.38$, $SD = 53.00$).

Materials and Procedure

A 30-item questionnaire with three subscales of metacognitive awareness of reading strategies inventory (MARSIS, Mokhtari & Reichard, 2002) was used to measure their RS. Global reading strategy (GRS, 13 items), first, assesses intentional and purposeful behaviors toward reading, such as making predictions, previewing and skimming, and aiming for goal achievement relating to higher-level text processing. Problem-solving strategy (PSS, 8 items) measures compensating behaviors for text meaning construction, such as slowing reading speed and rereading, thus corresponding more to lower-level text processing. The last scale, support reading strategy (SRS, 9 items), assesses self-support behaviors to facilitate text comprehension, such as paraphrasing, summarizing, and underlining. Participants' response was obtained from a 5-point Likert scale of 1 (never or almost never do) to 5 (always or almost always do). The reliability coefficients (Cronbach's alpha) were .82 for the entire scale, .76 for GRS, .68 for PSS, and .65 for SRS scales, respectively, after excluding two items each from GRS and SRS scales that lowered the reliability coefficients (Cronbach's alpha).

For evaluating reading comprehension skills, the Extensive Reading test developed by the Edinburgh Project on Extensive Reading (EPER) was employed. Levels B and C of the test, valid for "high intermediate" and "intermediate" levels, respectively, were used. Participants were required to read a narrative text at each level and complete 40 questions in total (Cronbach's alpha = .88).

For reading fluency, a single sentence reading task in which participants read 120 English sentences (11.5 words long on average) comprising mostly highly frequent words was used. Participants read each sentence on a computer screen silently and pressed a button when they finished. Forty percent of sentences were followed by a yes/no question, and the mean accuracy was 88.3%. Reading rate obtained from this task was used as a measure of reading fluency.

Analysis

We conducted a hierarchical cluster analysis in our attempt to identify the relationship between RS use and L2 reading skills. This enabled classifying the dataset into smaller number of subgroups such that the data within each cluster includes similar values or similar behaviors (Pastor, 2010). Ward's method (squared Euclidean distance) was used on the standardized scores of each of the three MARS subscales, on reading comprehension, and on reading fluency. The number of clusters identified was based on the hierarchical cluster dendrogram, the variance ratio criterion (Caliński & Harabasz, 1974), and our research purpose. Further analyses including post hoc tests were performed to identify the characteristics of each cluster.

RESULTS

One outlier case (more than 2.5 SDs away from the mean) in the reading fluency score was excluded to obtain normal distribution of all the scores. Table 1 shows the descriptive statistics for raw scores on each variable.

Table 1. Descriptive Statistics

	<i>M</i>	<i>SD</i>	95% CI	Skewness	Kurtosis
Reading comprehension	37.77	10.35	[34.87-40.67]	-0.46	-0.20
Reading fluency (wpm)	121.46	35.05	[111.33-131.59]	0.65	-0.50
Metacognitive reading strategy					
Global reading strategy	3.25	0.56	[3.09-3.41]	0.02	-0.40
Problem-solving strategy	3.59	0.59	[3.43-3.76]	-0.34	-0.01
Support reading strategy	2.78	0.63	[2.60-2.96]	0.05	-0.19

Note. CI = confidence interval. wpm = words per minute

The cluster analysis identified three clusters that met our criteria and research objective. The characteristics of the participants in the three clusters are summarized in Table 2. The cluster-by-cluster pattern result is depicted in Figure 1.

Kruskal-Wallis and Freidman tests followed by Mann-Whitney U tests with Bonferroni correction were used to assess between-cluster differences of each variable and within-cluster differences of L2 reading measures and RS use (shown in the right-hand and bottom part of Table 2, respectively). As shown in Table 2, regarding the between-cluster comparison, first, significant differences in L2 reading proficiency were found among the clusters. Twelve participants in cluster 1 had the highest proficiency, followed by cluster 2 ($n = 22$) and cluster 3 ($n = 12$). Differences in reading fluency were also found between cluster 1 and the other two clusters. Regarding RS, the participants in cluster 3 (the lowest L2 reading proficiency) reported using all three strategies the most on average, of which the frequency of GRS use was statistically the same as that by participants in cluster 1 (highest L2 reading proficiency and fastest reading rate). No significant difference in PSS and SRS use was found between cluster 1 (the highest proficiency) and cluster 2 (the intermediate proficiency) but a significant difference was seen between the two clusters and cluster 3 (the lowest).

The within-cluster comparison is also shown in Table 2. Specifically, the participants (highest proficiency and fastest reading rate) in cluster 1 reported using PSS as frequently as GRS, followed by the use of SRS. The participants in cluster 2 (the intermediate) reported using PSS the

Figure 1. The summary of cluster-by-cluster pattern comparison of reading comprehension, reading rate, and three metacognitive reading strategies. All scores were standardized.

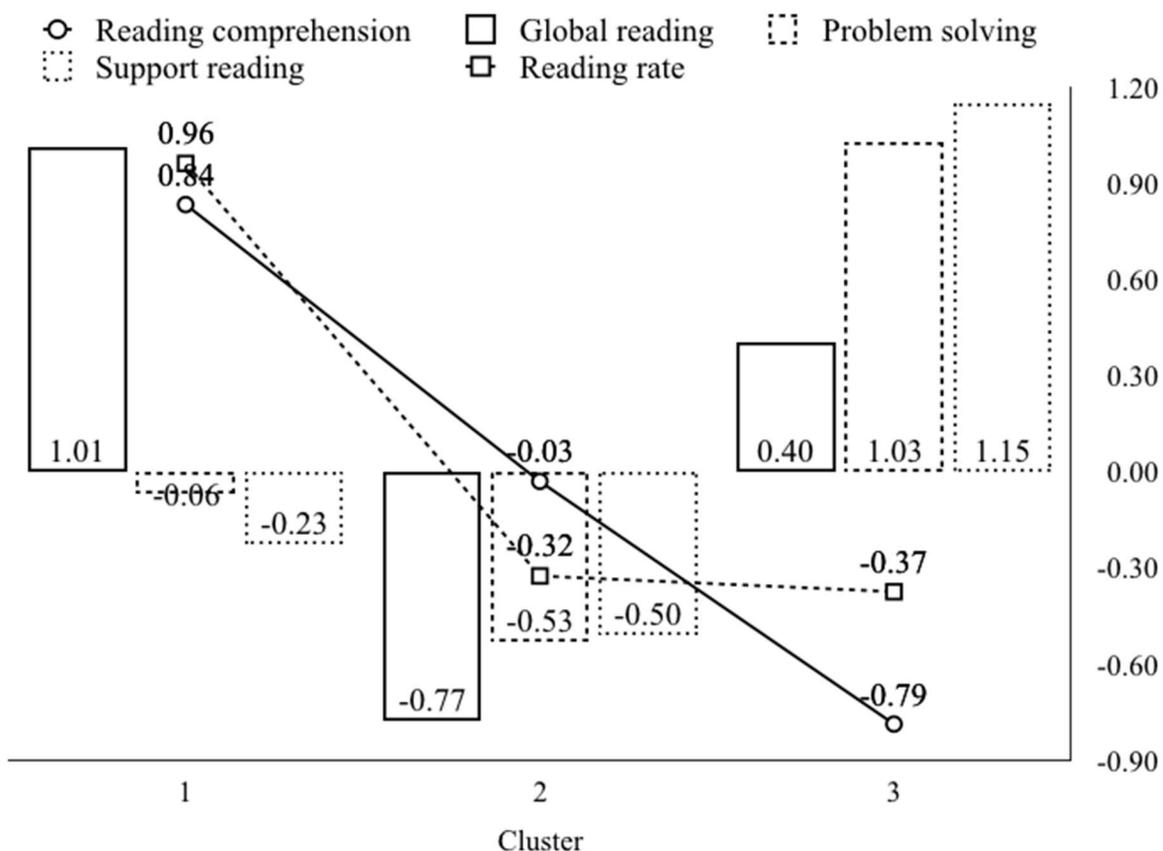


Table 2. Characteristics of L2 Learners' Use of MRS by Cluster

Measure	Cluster 1 (n = 12)	Cluster 2 (n = 22)	Cluster 3 (n = 12)	Mann-Whitney U	
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>p</i>	Bonferroni
Reading comprehension	47.33 (7.04)	38.41 (7.05)	30.58 (11.79)	**	1>2>3
Reading fluency (wpm)	155.25 (28.86)	110.14 (32.02)	108.42 (23.41)	***	1>2, 1>3
<u>Metacognitive reading strategy</u>					
Global reading strategy (GRS)	3.87 (0.30)	2.85 (0.38)	3.52 (0.39)	***	1>2, 2<3
Problem solving strategy (PSS)	3.57 (0.40)	3.31 (0.47)	4.18 (0.40)	***	1<3, 2<3
Support reading strategy (SRS)	2.65 (0.54)	2.48 (0.43)	3.51 (0.40)	***	1<3, 2<3
Mann-Whitney U					
<i>p</i>	***	***	*		

Bonferroni	GRS > SRS, PSS > SRS	GRS < PSS, GRS > SRS, PSS > SRS	GRS < PSS, PSS > SRS
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Note. All data reported are mean plus minus SD. wpm = words per minute. * $p < .05$; ** $p < .01$; *** $p < .001$
 most, followed by GRS and then SRS. Meanwhile, the participants in cluster 3 reported the highest use of PSS, followed by a similar frequent use of GRS and SRS.

DISCUSSION AND CONCLUSION

The results show the link between RS use and reading proficiency among L2 learners at different phases of L2 reading development. The relation between RS use pattern and L2 reading proficiency is complex and non-linear, which thus does not accord with the linguistics threshold hypothesis (Bernhardt & Kamil, 1991; Clarke, 1979).

A representative example obtained in the present study is that participants of low L2 reading proficiency (participants in the cluster 3) reportedly used not only PSS (relating to lower-level text processing) but the same frequent use of GRS (relating to higher-level text processing) as did the highest L2 reading proficiency group (participants in cluster 1). The intermediate L2 reading proficiency group (participants in cluster 2) reported using RSs the least. These data show that, whether the strategies function well, even low-proficiency readers may have access to various RSs during their comprehension process. In this regard, our findings are in contradiction with previous research reporting that L2 proficiency plays a role in constraining accessibility to RS (Cartwright, 2015; Zhang, 2001).

The non-linear transition of RS in reading development may reflect the process of restructuring one's internal metacognitive system (Kellerman, 1985). Compared to L1 readers, L2 readers are more likely to encounter problems from lower-level processing, due to their lack of L2 abilities, which in turn limits their cognitive capacities to use RSs. This is best demonstrated by the participants in cluster 2 (the intermediate L2 reading proficiency), who used the least RSs in this study. Although having higher L2 reading proficiency than cluster 3 (the lowest reading proficiency group), there was no difference in reading fluency between the two clusters. This leads us to speculate, by applying U-shaped development, that the intermediate L2 readers in cluster 2 would undergo a restructuring phase of RS in their reading comprehension processes, hence struggling in RS selection during reading. This speculation may further explain that their relatively long reading time implies their avoidance of using available strategies and their attempt to categorize RS as useful or non-useful in practice. Their slow reading and less RS use may explain that they have noticed the gap in RS use between L1 and L2 reading.

Participants in cluster 3 with the lowest reading proficiency, on the other hand, reported not only employing PSS and SRS more than the two advanced groups did, but also using GRS that relates more to higher-level text processing. This leads us to infer that their low L2 proficiency and multi-RS use are responsible for their slower reading rate, consequently leading to a different underlying cognitive processing from the intermediate group. By applying the U-shaped development again, the data indicate that the lowest group, multi-RS users, may have not reached the restructuring phase but are in the phase of recognizing the gap in whether their RS would or would not be applicable in the L2 reading process.

Each of the three distinctive differences in the pattern of RS use among the three groups split by the cluster analysis accords with the view of Sheorey and Mokhtari (2001): "poor readers [i.e., low-proficient L2 readers] are generally deficient in reading skills and using strategies.

Skilled readers [i.e., high-proficient L2 readers], on the other hand, ... are aware not only of which strategies to use, but they also tend to be better at regulating the use of such strategies while reading” (p. 445).

In summary, the present data support previous research in that metacognitive awareness of reading strategy relates to individual difference (i.e., reading proficiency and reading fluency), but not in terms of frequency and kinds of reading strategy use. Some of our data showed that one’s reading proficiency does not explain the frequency and kinds of reading strategy use. In this regard, if we assume that a restructuring and U-shaped process take place (in this context, overgeneralization and inappropriate use of reading strategies, followed by restructuring with less strategy use, and appropriate use of strategies) in the reading development, it can explain the case referred in the Introduction that readers misuse L1 reading strategies in L2 reading (Erler & Finkbeiner, 2007; Macaro, 2001). Such misused strategies are reliable in L1 but not in L2, and hence the readers might have been in pre-restructuring phase, and might have overgeneralized available strategies in the L2 reading. The present data suggest that metacognition in reading may be refined through developing low-level text processing skills and through a non-linear and U-shaped developmental phase (cf. Kellerman, 1985; Stemberger, 1994).

Recommendations for future studies are a longitudinal study that allows to identify an individual’s transitional process of RS use through each reading development. Each L2 reading development comprises internal (i.e., language learning experiences) and external (i.e., culture and society) factors that are ever-changing over the learning process (Larsen-Freeman, 1997). The accumulation of research findings may identify the variables that influence the frequency and kinds of reading strategy use and their relationship with reading development.

IMPLICATIONS AND FUTURE DIRECTIONS

With the knowledge that a differential pattern of RS use is associated with L2 proficiency, teachers may be able to recognize the metacognitive aspects underlying students’ apparent reading performance at the different phases of learning levels and provide practical suggestions and information that meet their needs (i.e. Vygotsky's zone of proximal development concept). Guiding students to optimal RS use and providing benefits through training on practical and strategic reading are vital to encourage the restructuring process (Brown, 2008). Also, as the purpose of reading is closely relevant to the type of RS to be used (Grabe, 2009), teachers can instruct proficient readers, preferably, to select specific RSs in specific reading situations for effective and deeper text comprehension (Prichard & Atkins, 2018). Meanwhile, less proficient readers should not be forced to use particular RSs; various RSs need to be introduced, but in the process, instruction is vital to keep them from overusing ones that are not yet ready to be used in their L2 reading (i.e., GRS). Learning opportunities need to be provided to fine-tune their skills in identifying RSs.

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