Exploring Metacognitive Strategies in Reading Academic Texts among More and Less Proficient EFL University Students

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Abstract

Research has showed a positive relationship between metacognitive knowledge and success in reading comprehension. Thus, it is important to be aware of metacognitive strategy use in reading comprehension. This study was intended to explore metacognitive strategies in reading academic texts among more and less proficient English university student readers. To this end, 75 English as a foreign language (EFL) students (including 45 more proficient and 30 less proficient students), who were selected nonrandomly from two universities, participated in this mixed-methods study. To collect data, the Survey of Reading Strategies and the Test of English as Foreign Language were administered to them. Also, to elicit how they utilize the metacognitive strategies, five more proficient and five less proficient EFL readers were asked to undertake think-aloud tasks. Results of quantitative (*t*-tests) and qualitative data analysis showed that there were significant differences between the metacognitive strategies used by more and less proficient readers. More proficient readers reported using the strategies at a high frequency level overall, but less proficient readers reported using them at a moderate frequency level. More proficient readers preferred to use problem-solving strategies followed by global strategies, whereas less proficient ones preferred to use problem solving strategies followed by support strategies. In addition, the results of think-aloud indicated that the more and less proficient readers' methods of employing metacognitive strategies differed, to some extent, from each other in quality of use. The findings provide implications for low proficiency EFL readers who intend to improve their reading comprehension and learning autonomy.

   Key Words*:* reading comprehension; EFL learners; metacognitive strategies

1. Introduction

Reading has been a significant component of language learning over the past forty years, and one of the most important and complex language skills (Grabe & Stoller, 2001). Also, the ability to read academic texts is considered as one of the most important skills that English as a foreign language (EFL) university students need to acquire to perform cognitive and procedural tasks such as taking a test, writing a paper or giving a speech (Levine, Ferenz, & Reves, 2000). Many of them may not need to speak English in their daily lives, but they need to read it to access the richness of information in English (Eskey, 2005).

However, reading comprehension is not easy and many language learners have difficulties in comprehending academic text completely (Eskey, 2005). Actually, comprehension does not occur accidently. It is a constructive process that involves the reader, the text, and the interaction between the reader and the text (Rumelhart, 1977). Having good decoding skills, adequate reading vocabulary, and an ability to recall what the text said, is not enough. Reading demands readers who are strategically engaged in the construction of meaning (Anderson, 1999).

Research (e.g., Sheorey & Mokhtari, 2001; Zhang, 2001) has also showed that successful readers, in general, display a higher degree of metacognitive awareness, which enable them to use reading strategies more effectively than their unsuccessful peers. Metacognition is perceived as one's ability to control his or her cognitive processes (Kuhen & Dean, 2004; O'Malley & Chamot, 1990). It is believed that lack of metacognitive knowledge may make students become confused and fail to use suitable techniques in reading comprehension (Shokrpour & Fotovatian, 2009). Proficient and successful readers may employ metacognitive tools and be actively engaged in the processes of planning, monitoring, and evaluating, which may help them alleviate the problems they encounter in reading comprehension (Anderson, 2003). Using metacognitive strategies such as self-awareness and self-evaluating can assist independent readers at different proficiency levels to control their own reading (Flavell, 1981).

This study aimed to indicate how more proficient and less proficient EFL readers implement metacognitive reading strategies in the academic reading context in terms of their choice and frequency of strategy use.

2. Literature Review

2.1. Metacognitive Strategies

Strategies are defined as "conscious actions that learners take to achieve desired objectives" (Cohen, 1990, p. 15), and learning strategies, in Oxford's (1990) terms, are viewed as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective,

and more transferable to new situations" (p. 8). As a subset of learning strategies, reading strategies are described as "mental operations involved when readers approach a text effectively and make sense of what they read" (Barnett, 1988, p. 150). In other words, reading strategies refer to those mental processes that readers consciously choose to use while reading texts (Cohen, 1990). As learners consciously learn and practice specific reading strategies, the strategies move from conscious to unconscious, that is, from strategy to skill (Anderson, 2003).

There are different taxonomies and the classification of strategies in the literature. O'Malley and Chamot (1990), for instance, refer to strategies in three categories as cognitive, metacognitive and social or affective. Cognitive strategies involve more direct manipulation of the learning material. Metacognitive strategies involve planning for learning, thinking about the learning process as it is taking place, observing one's production or comprehension, correcting one's own mistakes, and evaluating learning after an activity is completed. Social or affective strategies have close relationship with social-mediating activity and interacting with others. Moreover, Oxford (1990) divides learning strategies into two main groups: direct and indirect strategies. Direct strategies involve the new language directly and include memory, cognitive and compensation strategies which require mental processing of the language. Indirect strategies provide indirect support for language learning by employing metacognitive, affective and social strategies.

Metacognitive reading strategies are higher order performance methods/techniques that refer to the planning, monitoring, and evaluating the success of a learning activity (Pressley & Afflerbach, 1995). According to O'Malley and Chamot (1990), "students without metacognitive approaches are essentially learners without direction or opportunity to review their progress, accomplishments and future directions" (p. 561). Awareness of metacognitive reading strategies is important since it involves the awareness of whether or not comprehension is taking place; it is the conscious application of one or more strategies to correct comprehension; "if learners are not aware of when comprehension is breaking down and what they do about it, they will not be able to use strategies strategically" (Carrell, 1989, p. 8). In fact, metacognition includes high thinking skills that students use to plan, monitor, and evaluate their own learning (Livingston, 1997). It includes two dimensions— metacognitive knowledge and metacognitive regulation (Flavell, 1979; Schraw, Crippen, & Hartley, 2006; Vandergrift, Goh, Mareschal, & Tafaghodtari, 2006). Metacognitive knowledge refers to what a learner knows about his own cognition or about cognition in general (Schraw, 1998). It is divided into declarative, procedural, and conditional knowledge (Brown, 1987; Jacobs & Paris, 1987). Declarative knowledge indicates a learner's understanding about what reading strategies are; procedural

knowledge refers to knowing how to do things and sequence strategies effectively (Stanovich, 1980); conditional knowledge refers to knowing when, where and why to apply various cognitive actions to achieve their reading goals (Garner, 1980).

Metacognitive regulation refers to metacognitive activities that help learners to control their own thinking or learning. It includes planning, monitoring, and evaluation (Flavell, 1979; Schraw, Crippen, & Hartley, 2006; Whitebread, Coltman, Pasternak, Sangster, Grau, Bingham, Almeqdad, & Demetriou, 2009). Planning is the selection of appropriate strategies and allocation of cognitive resources before the task. Monitoring is the awareness of understanding and performance during the task. Evaluating is the appraisal of performance after task completion (Woolfolk, 2013). In fact, metacognitive reading strategies are techniques that refer to the planning, monitoring, and evaluating the success of a reading activity, so they include planning, monitoring and evaluating strategies. Planning strategies are used before reading, such as activating learners' background knowledge to get prepared for reading (Almasi, 2002). Monitoring strategies occur during reading, such as comprehension of vocabulary, self-questioning, summarizing, and inferring the main idea of a paragraph (Israel, 2007; Pressley, 2002). Evaluating strategies are employed after reading, such as thinking about how to apply what they have read to other situations.

2.2. Previous Studies on Metacognitive Strategies

Assuming that metacognitive reading strategies are effective ways to facilitate students' reading comprehension, some researchers have investigated effectiveness of instruction for metacognitive strategies in the field of second or foreign language (L2) studies. For instance, Salataci and Akyel (2002) examined the effectiveness of instruction for metacognitive strategies among Turkish learners of English. The results showed that the 4-week explicit training of activating background knowledge and monitoring their reading process positively influenced the use of the global strategies. Likewise, Aghaie and Zhang (2012) investigated the influence of explicit teaching of cognitive and metacognitive strategies on Iranian EFL university students' reading ability. The results showed that strategy instruction could result in autonomous reading behaviors. More recently, Dabarera, Renandya, and Zhang (2014), who investigated the impact of metacognitive scaffolding and monitoring strategies on reading comprehension in English as a second language (ESL) among 67 Secondary students in Singapore, reported that an increase in metacognitive awareness was correlated with reading comprehension improvement.

A number of studies have been conducted to explore metacognitive reading strategies or awareness between native and nonnative speakers, first and second languages, or second and foreign language contexts. For instance, Sheorey and Mokhtari (2001) investigated the difference in metacognitive

strategies and awareness of reading strategies between 150 English native and 152 non-native college students in the U.S. The results showed that ESL students reported using a greater number of strategies than did the native US students. Also, proficient readers were more able to not only select which strategies to use but also monitor the use of such strategies during their reading process. Furthermore, Zhang (2001) looked into metacognitive knowledge of reading strategies for different English proficiency levels of Chinese EFL college students. The results from interviews showed that there was a difference among more advanced and less advanced Chinese participants; more advanced students used monitoring their reading comprehension, skimming for the key ideas, and guessing meaning more, while the less advanced Chinese EFL subjects noted that they depended on a dictionary for word meaning, and translated passages from English into Chinese. In addition, Karbalaei (2010) compared the use of metacognitive reading strategies by Iranian EFL and Indian ESL readers. The results of his study showed that Indian students reported using metacognitive strategies more often than did the Iranian students. The Indians were more interested in using top-down strategies such as summarizing, paraphrasing, note-taking while the Iranians were more interested in using bottom-up strategies such as using a dictionary.

Despite the consensus on the significance of metacognitive strategies, in reading comprehension, more empirical research is required to shed light on metacognitive reading strategies used by successful and less successful learners. As Singhal (2001) states, investigations into metacognitive reading strategies used by successful and less successful L2 learners are less common. Besides, research on metacognitive reading strategy use and its relation to reading proficiency is still in its infancy. It seems that little research has explored the use of metacognitive reading strategies of Iranian EFL students, including more and less proficient students, majoring in English at the university where they have to read academic texts. Some of these EFL students do not know about appropriate metacognitive reading strategies, or do not know what they actually do when reading, hence impeding them from comprehension. In actual reading, some EFL students may not use all of the strategies they report in all cases of reading. Thus, the present study was intended to explore what metacognitive reading strategies more proficient and less proficient EFL readers themselves reported to use; what metacognitive reading strategies these readers actually used when reading academic texts; and what significant differences existed between more proficient and less proficient EFL readers. In light of the above issues, this study sought to address the following research questions:

1. What metacognitive reading strategies do more proficient and less proficient EFL readers perceive to use?

2. Is there any significant difference between more proficient and less proficient EFL readers in the perceived use of metacognitive reading strategies?
3. What metacognitive reading strategies do more proficient and less proficient EFL readers actually use when reading academic texts?

3. Method

3.1. Participants

To carry out this study, 75 (50 females and 25 males) EFL students from Shahrekord and Isfahan Universities were selected. They included undergraduate students, majoring in English translation, with ages from 20 to 28. These students were native speakers of Persian and had just taken Reading Comprehension Course at the university. They were selected non-randomly from the abovementioned universities, where they were available and could be accessed by the researchers. They were junior and senior EFL students who had studied English as a foreign language for at least eight years in secondary, high, or/and pre-university schools and university, and had acceptable command of English for the purpose of this study. They were divided into more proficient and less proficient readers based on their scores on the Reading Comprehension Final Examination, which was a teacher-made achievement test, and the Test of English as Foreign Language (TOEFL). Out of 75 EFL students, 45 EFL students were considered as more proficient and 30 EFL students were considered as less proficient readers to take the survey. Also, 5 more proficient and 5 less proficient EFL students participated for think-aloud sessions.

3.2. Dtata Collection Methods

This study made use of the following instruments for data collection: the Survey of Reading Strategies (SORS), TOEFL Reading Proficiency, and think-aloud protocol.

The Survey of Reading Strategies (SORS) was used in order to identify which metacognitive reading strategies readers used. The SORS is a questionnaire designed based on the Metacognitive Awareness of Reading Strategies Inventory (Mokhtari & Sheorey, 2002). The SORS was developed to measure non-native English speakers' metacognitive awareness and perceived use of strategies in reading. It consisted of 30 items, each of which used a five-point Likert scale (ranging from "*I never or almost never do this*" to "*I always or almost always do this*"). The score for each item could range from 1 to 5. In the survey, the respondents read each statement and circle the number that indicated the frequency with which they would use the reading strategy. Thus, the higher the number, the more frequent the perceived use of the strategy was concerned. The score average indicated how often EFL students believed they used the strategies when reading academic texts.

The questionnaire measured three broad categories of reading strategies: global (13 items), problem solving (8 items), and support (9 items) strategies. The alpha coefficient for internal consistency and reliability with the sample of the EFL students was 0.93. The subscales showed high internal consistency and reliability, with an alpha coefficient of .92 for the global subscale, .79 for the problem solving subscale, and .87 for the support strategy subscale.

TOEFL Reading Proficiency was used to ensure the reading proficiency level of the more and less proficient reader participants at the time of data collection (administering the SORS and doing think aloud tasks). TOEFL is a standard test of English language proficiency that measures the ability of non-English speakers to communicate in English in an academic setting (Educational Testing Service, 2011). In this study, just the reading section of paper-based test (2003) was used. It consisted of 5 passages, accompanied by 55 multiple-choice items. The reliability estimate of this instrument in this study was determined through Cronbach's alpha coefficient, $\alpha = 0.89$, which indicated an acceptable internal consistency index. All the texts were examined based on the elements such as readability, number of words, and length (see Table 1) in order to ensure their validity and reliability. The readability of the texts was assessed based on the Flesch Reading Ease Test. The time limit of the test was 55 minutes. A score of 1 was awarded to each correct answer, and there was no penalty for wrong answers.

Table 1
Reading Levels of the Five Passages in the TOEFL Reading Proficiency Test

	Passage 1	Passage 2	Passage 3	Passage 4	Passage 5
Total Words	152	336	390	370	378
Total Number of Sentences	4.5	5.5	6.5	6	5
Sentences per Paragraph	15.2	20.5	10	18	17.2
Words per Sentence	10	15	27	22	37
Reading Ease	45.7	53.4	52.2	53.6	49.6
Reading Grade Level	10.2	10.8	9.9	10.4	11.9

Think-aloud was also used to determine what metacognitive reading strategies these students actually used during independent reading. Ten participants (5 more proficient and 5 less proficient readers) were invited for think-aloud tasks. Two texts with appropriate level of difficulty were selected. During the think-aloud sessions, each participant read two academic texts with the presence of the one of the present researchers; each session lasted about 60-80 minutes. In think-aloud, because the students might avoid verbalizing their mental processes due to their lack of proficiency in L2 (Davis & Bistodeau, 1993), they were allowed to verbalize in whatever language they felt most comfortable using. All the participants preferred to

use their native language and the think aloud protocols were recorded and transcribed by one of the present researchers immediately.

Think-aloud is a method in which an individual reports the processes that are happening in his mind while he is reading (Cohen, 1998). Oster (2001) views it a technique in which students verbalize their thoughts and strategies they are developing while they are reading a text.

To ensure the validity of the think aloud tasks, the participants were asked to verify the accuracy of the transcription and to clarify any inaccuracy. The transcription was later translated into English by one of the present researchers. After the transcription and coding processes were completed, one randomly selected think-aloud transcription was re-coded by another rater to ensure inter-rater reliability. The percentage of inter-rater reliability was high (about 84%). Disagreements were resolved by discussion. In addition, the think-aloud transcription was re-coded by the same rater, ten days after the first analysis in order to achieve intra-rater reliability, which was estimated to be .95.

3.3 Data Analysis Procedures

Ex post facto design was used since the present researchers had no control over what has already happened to the participants. In this study, 75 EFL undergraduate university students were selected through convenient sampling from the abovementioned universities. They were divided into more proficient and less proficient readers based on their scores on the Reading Comprehension Final Examination, a teacher-made achievement test, and TOEFL Reading Proficiency. Out of 75 EFL students, 45 EFL students were considered as more proficient readers and 30 ones were considered as less proficient readers. The mean score of the sample on the Reading Comprehension Final Examination was about 17. The specific score of 17 was used as the cutoff point to separate them into two groups –more proficient and less proficient readers. Besides, the score 17 and above in the Iranian educational system is considered as an A score. At the next stage, in order to make sure about their reading proficiency level, TOEFL Reading Proficiency (2003) was also administered. The minimum score of the more proficient readers was 44 (out of 55 points) and the maximum score of the less proficient reader was 33 (out of 55 points). That is, the more proficient group received a minimum of 80% (44 out of 55 points) and the less proficient group received a maximum of 60% (33 out of 55 points). This further supported the splitting manner.

To understand which strategies these EFL students perceived to use, they were asked to answer the items in the SORS. Moreover, to understand what metacognitive reading strategies the EFL students actually used, the data from think-aloud protocols were used. 5 more proficient and 5 less proficient readers voluntarily participated in think-aloud sessions. Short

training sessions were held for the more and less proficient readers because they did not know what they were supposed to do in the think-aloud procedure. During the 20-minute training sessions, an example paragraph was used to show the participants how they were to think-aloud while they were reading. They were also asked to practice the think-aloud protocol on another paragraph. Then, they were asked to read two texts with appropriate level of difficulty (*Sleeping Well: What You Need to Do* and The *Galapagos Islands*) to think-aloud individually. The think aloud protocols were recorded and transcribed by the present researchers. To understand the differences between more proficient and less proficient students, all the quantitative data from the SORS and qualitative data from think-aloud sections were analyzed and statistical tests of significance were used.

4. Results and Discussion

The first research question was intended to identify the metacognitive reading strategies reported to be used by more and less proficient EFL university students who participated in this study. To answer this question, the mean scores and standard deviations of the participants' responses to the SORS items were calculated. To understand the strategy use of both student groups clearly, the items were categorized into three separate subcategories: global, problem solving and support strategies. Table 2 reports perceived use of metacognitive reading strategies by more proficient and less proficient groups overall and in the three subcategories.

Table 2
Perceived Use of Metacognitive Reading Strategies by More Proficient and Less Proficient Groups

Category	More Proficient (N = 45)		Less Proficient (N = 30)	
	Mean	SD	Mean	SD
Global Strategies	3.80	.251	2.36	.230
Problem Strategies	4.07	.160	2.76	.197
Support Strategies	3.56	.150	2.67	.455
Overall Reading Strategies	3.81	.258	2.60	.222

According to Mokhtari and Sheorey (2002), mean of 3.50 or above shows the high use and, mean of 2.50 to 3.4 shows the medium use and mean of 2.4 or below shows the low use of reading strategies. As Table 2 demonstrates, the more proficient group on the whole reported using overall reading strategies at a high level (*M* = 3.81). The most frequently used category of metacognitive reading strategies was problem solving strategies, followed by global reading strategies. However, the less proficient group reported to use overall reading strategies at a moderate level (*M* = 2.60). The most frequently used category of reading strategies by the less proficient group was problem solving strategies, followed by support reading strategies.

To provide more detailed information as to the frequency of perceived strategy use of the more proficient and less proficient participants, Table 2 summarizes frequency of strategy use in the three subsections (global, problem solving, and support) in the high usage group (mean of 3.50 or above), medium usage group (mean of 2.50 to 3.4), and low usage group (mean of 2.4 or below).

Table 3

Frequency of Strategy Use in the Three Subsections

Usage	More Proficient			Less Proficient			Total	
	GLOB	PROB	SUP	GLOB	PROB	SUP	More Proficient	Less Proficient
High	13	8	6	0	0	0	27	0
Medium	0	0	3	5	7	5	3	17
Low	0	0	0	8	1	4	0	13

Note. GLOB = GLOBAL; PROB = PROBLEM SOLVING; SUP = SUPPORT

As Table 3 demonstrates, for the more proficient reader group, 27 of the 30 items (90%) fell in the high usage group and none of the individual strategies fell in the low usage category. For the less proficient reader group, none of the individual strategies fell in the high usage group and the majority i.e., 17 of the 30 items (about 57%), fell in the medium usage group.

Furthermore, to provide a better picture on the issue, the mean scores and standard deviations of responses to each of the 30 Likert scale items were calculated and the top ten strategies reported to be used by the more and less proficient readers were found. Tables 4 and 5 display the top ten strategies reported to be used by the two groups.

Table 4

Reports of Top Ten Strategies by More Proficient Group

Items	Metacognitive Reading Strategies	Mean	SD
25	Re-reading the text to Increase Understanding (problem solving)	4.33	.674
28	Guessing the meaning of unknown words or phrases (problem solving)	4.28	.661
3	Think about what I know (global)	4.24	.645
12	Deciding what to read closely and what to ignore (global)	4.20	.625
8	Noting length and organization (global)	4.15	.601
11	Adjusting reading speed (problem solving)	4.11	.572
14	Paying closer attention to reading (problem solving)	4.06	.617
7	Reading slowly and carefully (problem solving)	4.02	.656
19	Visualizing information (problem solving)	3.97	.690
16	Stop from time to time and think (problem solving)	3.93	.719

The more proficient group received higher mean scores on the top ten items overall. Also, as Table 4 demonstrates, for the more proficient group, seven of the top ten strategies (70%) were problem solving strategies and three of

them (30%) were global strategies. Based on Table 5, for the less proficient students, five of the top ten strategies (50%) were problem solving strategies, three of them (30%) were support strategies, and two of them (20%) were global strategy. This means that the more proficient readers preferred problem solving strategies more and preferred support strategies less.

Table 5
Reports of Top Ten Strategies by Less Proficient Group

Items	Metacognitive Reading Strategies	Mean	SD
13	Using reference materials (support)	3.86	.860
29	Translating from English into native language (support)	3.73	.855
25	Re-reading the text to increase understanding (problem solving)	3.00	.830
11	Adjusting reading speed (problem solving)	2.93	.868
19	Visualizing information (problem solving)	2.90	.884
28	Guessing the meaning of unknown words or phrases (problem solving)	2.86	.899
5	Reading aloud to better understand (support)	2.80	.846
12	Deciding what to read closely and what to ignore (global)	2.73	.691
7	Reading slowly and carefully (problem solving)	2.73	.944
3	Think about what I know (global)	2.70	.702

The second research question was intended to see whether there was any significant difference between more proficient and less proficient EFL readers in the perceived use of metacognitive reading strategies. Based on the above data, it was revealed that more proficient group reported to use metacognitive reading strategies ($M = 3.81$) including global ($M = 3.80$), problem solving ($M = 4.07$) and support ($M = 3.56$) strategies more than the less proficient group. Thus, independent *t*-tests were used to examine whether the observed differences in the means of the two groups were statistically significant. Table 6 summarizes the results of *t*-test for the difference between more proficient and less proficient participants on global, problem solving, support, and overall reading strategies. For this study, the level of significance was set at $p \leq .05$.

Table 6
T-tests on the Mean Differences in Reported Strategy Use by More and Less Proficient Readers

Strategies	More Proficient		Less Proficient		Mean difference	df	t	p-value
	Mean	SD	Mean	SD				
Global Strategies	3.80	.251	2.36	0.230	1.44	73	15.19	.000
Problem Solving	4.07	.160	2.76	.197	1.31	73	14.54	.000
Support Strategies	3.56	.150	2.67	.455	.89	73	5.12	.000
Overall	3.81	.258	2.60	.222	1.21	73	14.79	.000

As Table 6 shows, the difference of means between the more proficient and less proficient groups for global (t = 15.19, df = 73, p = .000), problem solving (t = 14.54, df = 73, p = .000), and support (t = 5.12, df = 73, p = .000) strategies were statistically significant at p < 0.0005. In addition, the observed difference in the means of the overall reading strategies between the two groups was statistically significant (t = 14.79, df = 73, p = .000). Thus, it can be concluded that there were significant differences between the two groups in their perceived use of metacognitive reading strategies.

The third research question was formulated to gain information about more and less proficient students' actual use of strategies when reading for academic purpose. To answer this question, the qualitative data from ten EFL students who sat for think-aloud sessions were used. The data collected from think-aloud sessions shows that the participants in the more proficient and less proficient groups used problem solving strategies more. One of the problem solving strategies brought up by the more proficient participants was *re-reading the text to increase comprehension*. The following excerpt demonstrates the use of this problem solving strategy.

> um … to answer the first question of Galapagos Islands text, I need to read the text again …er …I mean I need to read paragraphs 1, 2 and 3 again in order to see what happened first … (Maryam, one of the more proficient readers).

Of course, *re-reading the text was* also used frequently by the less proficient readers, reviewing the texts after their first reading. The second reading was to gain specific information and better understand the content.

Another problem solving strategy which was used by the more proficient participants very frequently was *guessing the meaning of unknown words or phrases*. One of the more proficient EFL participants demonstrated this in the following report:

> In the first paragraph of Galapagos Islands text, the word *tortoise* is new for me, um … but based on the sentence: "Weighing hundreds of pounds, these tortoises, or land turtles, wander slowly …" I can guess its meaning … Also, in the third paragraph, I don't know the meaning of *stews*, but because ...um... this word comes with *soups*, I think this is a kind of food … In the fifth paragraph, the word *consume* is new for me. Well, eh… based on the sentence, 'The pigs, dogs, and cats consume thousands of baby tortoises each year', I guess *consume* means to *eat* (Zahra, one of the more proficient students).

Also, Samaneh, another more proficient reader, reported that she decreased her speed while reading the first and last paragraphs of the texts to read more carefully. In other words, she adjusted her reading speed according to what she was reading. *Adjustment* was one of the problem solving strategies which was used by this proficient EFL participant because she perhaps knew that the first paragraph could give her some background

information about the *Sleeping Well: What You Need to Know* text, and the last paragraph intended to summarize what was discussed in the whole text.

Guessing the meaning of unknown words through the use of context was frequently utilized by the more proficient readers. While this strategy was important to them, adjusting one's reading speed was an important problem solving strategy for the less proficient participants in the think-aloud. The following excerpt demonstrates the use of this problem solving strategy.

> This passage [Sleeping Well] is long and difficult for me. I have to read it slowly to understand it better… [She read the next paragraph about the importance of enough good sleep] Oh...I got it. You can see the sentence here. It clearly says … (Fatemeh, one of the less proficient readers).

Since the text was hard for this less proficient student, she read much more slowly. *Adjusting her reading* speed was very important when she wanted to make sense of the text. Bahareh, another less proficient reader used *skipping difficult words* in the reading Galapagos Islands text as a problem solving strategy rather than the strategy of *guessing the meaning of unknown words* in the context. She reported, "I don't know the meaning of 'anchor', 'crews', 'row', 'seize', 'roll', 'stews' and 'carried off' in in the fourth paragraph. Well eh … I think it is too time-consuming for me to find all these words in the dictionary… I ignore this part now and will be back if necessary". She like other less proficient readers deliberately ignored certain parts because she could not make sense of them.

The more proficient participants also used other strategies such as *reading the questions before reading the texts, scanning the texts* and *paying attention to the organization and length of the texts*. These strategies seemed to be global. The following excerpt demonstrates the use of the global strategy of *giving priority to reading the questions before reading the texts* so as to focus on important parts.

> Let me first read the questions, it helps me focus on the important parts more, um … and ignore less important ones. The first and last questions here are important (Majid, a more proficient reader).

He proceeded to read the comprehension questions before returning to read the Galapagos Islands and Sleeping Well texts very attentively. In an attempt to understand the texts in detail, he devoted his time and attention to unknown words or expressions such as "deprivation", 'consume', 'hatch', and "cranky". This student seemed to be good at decoding word meanings using context provided as he further commented on how to figure out the meaning of deprivation:

> I am pretty sure that the word *deprivation* means something like *lack*. The sentence which I am reading now explains that lack of sleep can make you irritable and cranky. I've never heard of *cranky* before, but

I know that it must have a negative connotation. (Majid, a more proficient reader).

However, while undertaking the think-aloud task, Bahareh, who was a less proficient reader, decided to read the whole text first (before reading the questions in the text) in order to come up with a major idea conveyed in the text. Moreover, Mohammad, like some other less proficient readers, relied on the global strategy of *using prior knowledge* to answer questions in the text:

So I will answer this question based on what I already know. Well eh … I would say that our ages largely determine how much sleep we need … For example, infants and babies need many more hours of sleep than adults because proper development demands that babies sleep a lot (Mohammad, a less proficient reader).

Support strategies were used by both more and less proficient participants, especially by less proficient EFL readers. One of the noticeable support strategies used by the more proficient readers was *underlining*, *highlighting* or *circling information*, which helped them remember information:

I circle 'deprivation', 'cranky', 'groggy' and 'fatigue' here. When I want to review the text [Sleeping Well: What You Need to Know] and answer the questions, it helps me a lot (Maryam, a more proficient reader).

The more proficient readers did not reread the whole text, but only the sentences they had underlined in each paragraph. This strategy could help them recall precisely the key information to save reading time. Sometimes, of course, they went back and forth in the text to find relationships among ideas, but they did not read aloud the whole text.

However, the less proficient participants used support strategies such as *using reference materials* (e.g. a mobile dictionary) and *translating* (English into Persian) to help them understand the text better. They preferred to consult the outside sources before making use of context clues. The excerpt below illustrates how they one of the less proficient readers used this strategy:

I don't know the meaning of 'tortoises' and 'wander' in this paragraph, but I think they are important words… Let me look them up in the dictionary [He consulted his favorite mobile English-Persian dictionary (Nader, a less proficient reader).

The results have demonstrated that the Iranian EFL students, in general, employed a variety of metacognitive strategies frequently while they were reading academic texts in order to plan, control, and remediate their reading comprehension. As Anderson (2003) asserts, language learners use metacognitive strategies to foster their academic reading process and improve organization of learning time and self-evaluation. The above results are significant in the context of Iran because they emphasize the importance of

metacognitive strategies for EFL readers and contradict the common view that in a foreign language context students are not metacognitively aware of reading strategies.

Based on the data obtained from the SORS, the most favored reading strategies for both groups were problem solving strategies. Such strategies as *re-reading to increase understanding*, *guessing the meaning of unknown vocabulary*, *adjusting reading speed*, and *reading slowly and carefully*, are used when readers encounter comprehension problems during their reading. This preference for the high use of problem solving strategies reflects the fact that the EFL participants tended to monitor their comprehension and take actions when they thought that reading comprehension would break down. Also, the high use of such strategies indicated that the EFL readers did not consider them as time-consuming and interfering with continuity in reading.

Besides, the patterns of usage between the two groups revealed that the more proficient readers were high users in metacognitive reading strategies overall whereas the less proficient readers were moderate users. This finding suggested that the differences in perceived use of reading strategies might be due to differences in reading proficiency between the two reader groups. That is, the more proficient reader group had a higher degree of awareness of the importance of using mechanisms that helped reading comprehension. This finding seems to correspond to previous research (e.g., Carrel, Pharis, & Liberto, 1989; Shah et al., 2010; Zhang, 2001; Zhang & Wu, 2009), which has provided evidence that proficient learners are more aware of reading strategies.

Also, the findings revealed statistically significant differences between the more proficient and less proficient groups in their perceived use of reading strategies. That is, the more proficient readers outperformed the less proficient ones in all three categories of metacognitive reading strategies. These findings were consistent with several other studies, which revealed a relationship between the use of strategies and students' language proficiency level (Shah et al., 2010; Zhang, 2001; Zhang & Wu, 2009). According to Carrell, Gajdusek and Wise (1998), highly proficient students are able to establish objectives in reading, analyze the text, adjust their reading speed, repair miscomprehension, engage in self-questioning, and evaluate the reading materials. More likely, they are aware of what and why they are reading; they plan and monitor their comprehension and use suitable strategies when they face problems (Pressley & Afflerbach, 1995). In other words, it is logical to assume that, compared with the less proficient readers, the high proficient EFL readers had developed greater metacognitive awareness and were able to self-regulate the strategies used.

Furthermore, the data from think-aloud revealed that even though there were similarities between the more and less proficient readers, there were qualitative differences in the actual use of metacognitive reading

strategies. Although both reader groups used problem solving strategies in think-aloud tasks, the more proficient readers actually used more effective ones or used metacognitive strategies more effectively. For instance, it was found that the less proficient reader group made a decision as to when to skip certain words or parts if they were very difficult to them or if they found other sources (e.g., contextual clues) time-consuming. Sometimes they skipped difficult words when they did not want to continue consulting the dictionary. However, the more proficient reader group made a decision as to when to skip certain difficult words or sentences if they gained global comprehension of the text. Some students in the less proficient reader group sometimes skipped some sections where important ideas were embedded and provided answers to questions based on the global strategy of prior knowledge, which was ineffective in answering the questions. That is to say, the less skilled readers used this strategy unavoidably perhaps when they lacked motivation. However, the more proficient reader group used the global strategy of giving priority to reading the questions before reading the texts so as to focus on important parts in answering the questions. Also, whereas the less proficient readers tended to review the texts after their first reading by re-reading all from beginning to end, the more proficient readers re-read only the important parts.

Besides, it was evident that the participants in the less proficient reader group used support strategies more, but they did not manage to employ them more effectively. For instance, whereas the less proficient reader group often depended on outside sources of information (e.g., a dictionary or translation) to foster comprehension, the more proficient reader group used different types of context clues to improve comprehension. It can be argued that some support strategies were time-consuming to more proficient readers and supposedly interfered with continuity in reading, but using support strategies such as bilingual mobile dictionaries were the simplest way to determine the meaning of words rapidly for the less proficient readers in think-aloud tasks. Perhaps, failing to guess meanings from context due to their limited English proficiency, they immediately consulted outside materials to remediate comprehension problems.

5. Conclusion and Implications

The findings of this study showed that the more proficient EFL readers reported using metacognitive reading strategies at a high frequency level and the less proficient EFL readers reported to use the strategies at a moderate level. The quantitative data from the self-report questionnaire revealed that the more proficient reader group preferred to use problem solving strategies followed by global and support strategies, and the less proficient reader group preferred to use problem solving strategies followed by support and global and strategies. Moreover, inferential statistics demonstrated significant

differences between more proficient and less proficient EFL readers in the perceived use of problem solving, global and support strategies. The data from think-aloud revealed some similarities and qualitative differences between the more and less proficient readers in the actual use of metacognitive reading strategies. The more proficient readers actually used more effective ones. When they used the same strategy (e.g., support strategy), the participants in the more proficient group implemented it more effectively perhaps due to a higher degree of awareness and L2 proficiency level. They could monitor their comprehension, take actions when comprehension broke down, and plan their reading comprehension process better.

The above findings can expand previous research in the area of metacognitive awareness and use of reading strategies among EFL learners. The findings imply that less proficient L2 readers may benefit from metacognitive training courses that can guide them to an awareness of effective metacognitive strategies to obtain a higher level of reading comprehension. Familiarizing them with the use of various effective metacognitive strategies in L2 academic reading may help them decrease their mistakes, solve their reading difficulties and facilitate their understanding of L2 academic texts. The results showed that some less proficient EFL readers relied on support strategies such as *use of (bilingual) dictionaries* in reading texts. L2 teachers can assist them in constructing the meaning of unknown words from the context. Besides, the results suggest that L2 teachers can model strategies and provide verbal practice of strategy use by means of think-aloud procedures in the classroom. The findings encourage L2 teachers to include such activities as whole-class discussions in which teachers ask students to report the strategies used, discuss reading difficulties students encountered, and encourage students to express their thoughts about the usefulness of particular strategies.

Even though a self-report measure and think-aloud protocol were used in the present study to gain information on how the EFL students used metacognitive strategies, this study was not able to report all possible strategies utilized to accomplish reading tasks. For instance, due to the complexity of thoughts and actions, some strategies (e.g., *visualizing information* and *asking oneself questions*,) became difficult to observe. Further, some of the EFL readers could not precisely articulate their cognitive processes while undertaking a task concurrently or they might misreport what they were doing. Thus, further research can employ other research tools such as interview to gain detailed information about metacognitive strategy use.

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