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Sri Lankan University Students' Metacognitive Awareness

of L2 Reading Strategies

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Abstract

The present article reports an investigation into the metacognitive reading processes of 168 Sri Lankan university students with respect to three reading proficiency levels: low, intermediate and high. With the use of a reading comprehension test, students were grouped into three proficiency levels and their metacognitive awareness of reading processes were assessed using the Mokhtari & Reichard's (2002) Metacognitive Awareness of Reading Strategies Inventory (MARSI). A positive linear relationship was found between Sri Lankan students' metacognitive awareness of reading strategies and their text comprehension. All Sri Lankan university students in all three proficiency levels reported using problem solving strategies most frequently followed by global and support strategies with higher use of strategies by higher level students.

1. Introduction

Reading is an active, purposeful process which involves several word level processes such as decoding, fluency and vocabulary skills. Similarly, reading involves higher-level language skills such as activation of prior knowledge, self-questioning, comprehension monitoring, inferring, predicting and so forth required for better comprehension. Studies have shown that these strategies which are related to readers' metacognitive knowledge play an important role in reading comprehension. Metacognitive knowledge allows readers to reflect on their planning, goal setting, processing of understanding, monitoring of progress, recognition of problems and repair problems as they read texts (Baker & Brown, 1984; Grabe & Stoller, 2002). Thus, metacognitive knowledge plays a crucial role to understand readers' explicit and conscious use of reading strategies.

During the past two decades, there has been a growing body of research focusing on readers' reading processes which emphasize different metacognitive and cognitive strategies readers employ while comprehending texts. In an increasingly globalized world, reading in English is becoming important for people working in professional areas. In the Sri Lankan university context, reading is one of the skills that is emphasized in General English language courses. However, there has been no research undertaken to investigate the metacognitive awareness of reading strategies in L2 reading of general and academic texts. Drawing on the research in the field of metacognition and reading, this research specifically investigates the area in relation to Sri Lankan university students, examining the metacognitive awareness

of reading strategy use by students at different levels of text comprehension. More specifically, the main purpose of the study was to examine the relationship between Sri Lankan university students' metacognitive awareness of reading strategies and their text comprehension levels.

2. Research Literature

2.1. Metacognition and reading

Although different forms of metacognition date back to 1900, Flavell (1979) was the first to introduce the term 'metacognition' based on 'metamemory' as 'knowledge and cognition' 'about cognitive phenomena or learners' knowledge of their own cognition (p.906). It also refers to learners' awareness of their own knowledge, and control of the processes by which they learn (Brown, 1987, Garner & Alexander, 1989). Elaborating Flavell's definition further, Paris and his colleagues defined it by adding two more essential features of 'self appraisals' and 'self-management' of cognition (Paris & Jacobs, 1984; Paris & Winograd, 1990). Self-appraisal of cognition refers to learners' reflections on their abilities, understanding and affective state in the learning process whereas self-management refers to 'metacognition in action' which helps to 'orchestrate aspects of problem solving' (Paris & Winograd, 1990, p. 8). According to Hyde and Bizar (1989), 'metacognitive processes are those processes in which an individual carefully considers thoughts in problem solving situations through the strategies of self-planning, self-monitoring, self-questioning, self-reflecting and or self-reviewing.' (Hyde & Bizar, 1989: p.51). Although some confusion has arisen in some other definitions of metacognition in the literature (Weinert, 1987; Adey & Shayer, 1994; Kluwe, 1987; Watts, 1998), all definitions refer to the processes controlled by cognitive functions.

An extensive body of research in the area of reading that places emphasis on the role of metacognition has emerged during the last two decades particularly in L1 contexts (e.g. Baker & Brown, 1984; Garner, 1987; Hacker et al., 1998; Myers & Paris, 1978; Myers, 1998; Paris & Stahl, 2005; Paris et al., 1991; Pressley et al., 1995). In the area of reading, metacognition involves the readers' monitoring of whether the written material is successfully comprehended coupled with active reading strategies that enhance and repair comprehension. Israel (2007) notes that use of metacognitive strategies fosters readers' meaning construction, monitoring of text, and their ability to evaluate the text and reading comprehension; she also states that 'metacogntively skilled readers are readers who are aware of knowledge, procedures, and controls of the reading process; they use this knowledge during the reading process to improve reading and comprehension ability' (Israel, 2007, p. 3).

Cognitive and metacognitive strategies are closely related and dependent upon each other; cognitive strategies are used to help an individual to understand a text while metacognitive strategies are used to ensure or evaluate one's understanding of that text. Metacognitive knowledge or awareness precedes or follows a cognitive activity (Livingston, 1996). It often occurs when cognitions fails, such as the detection that one does not understand what one reads. For example, a student is conscious that s/he has the difficulty in understanding the meaning of words (cognition) in a text s/he reads. Therefore, s/he attempts to understand the words through referring dictionaries or guessing the unknown words through context or guessing the meaning through word parts (metacognition). Knowledge is considered to be metacognitive if it is actively used in a strategic manner to ensure that a goal is met. Therefore, in this study, metacognitive awareness or metacognitive strategies are used interchangeably to mean the same idea.

2.2. Comprehension monitoring

Comprehension monitoring is a thoroughly established and researched notion in the area of reading. It is considered as one kind of action under the umbrella of metacognition, which refers to all behaviors that allow readers to judge whether comprehension is occurring (Casanave, 1998). Baker and Brown (1984) define it as an ongoing action

of evaluating and regulating one's understanding of what one reads. It consists of self-regulatory mechanisms that help learners in effective reading (Markman, 1981). According to Baker and Brown (1984), if the reader understands 'the active nature of reading and the importance of employing problem solving, troubleshooting routines to enhance understanding', she or he could be a very proficient and effective reader. This kind of 'self awareness is a prerequisite for self-regulation, the ability to monitor and check one's own cognitive activities while reading' (Baker & Brown 1984: p.376). Baker and Brown (1984) further state that competent readers manipulate the following skills in regulating how they understand the text: 1) clarifying the purpose of reading to understand the tasks implicitly and explicitly; 2) identifying the important ideas of the message; 3) focusing attention on the main content; 4) monitoring ongoing behavior or activities to verify whether comprehension is taking place; 5) engaging in self-questioning to determine whether objectives or goals are accomplished and 6) taking remedial action when failure in comprehension is noticed. Effective readers rely on these skills by elaborating, questioning, regulating their own knowledge and the content of the text and monitoring their understanding (Palinscar & Brown, 1984).

2.3. Comprehension monitoring of L2 adult learners

Although there exists a substantial amount of research on comprehension monitoring in L1 contexts, research on this area in L2 contexts is sparse. Yang (2002) undertook a research on the comprehension monitoring of twelve university students categorized as less proficient readers and proficient readers based on the scores obtained in the mid-term and final reading exams. College-level texts at the first year level were used in this study utilizing the think aloud procedure with teacher intervention to facilitate the procedure. She found that less proficient readers' comprehension monitoring was limited only to lexical level while proficient readers' cognitive processes in comprehension monitoring covered checking the meaning of words, evaluating the grammaticality of a sentence, the logical consistency of the ideas in the text, the consistency of the facts in the text with what a reader knows, the cohesive relationship among propositions, and the thematic compatibility of the ideas, and reviewing whether text provides all information for full understanding. She claims that if a reader possesses higher language knowledge, his/her comprehension monitoring operates at a higher level, leading to the higher level comprehension of the text standards. She also claims that comprehension monitoring is crucial, since L2 readers should be aware of what kind of reading problems they encounter and what kind of strategies they should use to solve them, and that sufficient basic language skills are necessary in order to monitor their comprehension.

2.4. Strategy use of ESL readers

Recent investigations have focused mainly on strategy use or metacognitive strategy use among different groups of L2 readers. Many empirical studies on metacognitive strategies in reading comprehension reveal that successful L2 readers are aware of how to use appropriate strategies to enhance text comprehension (Chamot & Kupper, 1989) whereas poor readers possess little awareness on how to approach reading (Baker & Brown, 1984) and lack effective metacognitive strategies to monitor their text comprehension (Brown, 1987; Anderson, 1991).

Li and Munbi (1996) investigated metacognitive strategy use by two ESL Chinese graduate students in reading academic texts with the use of in-depth interviews, think-aloud sessions, and journals. Their study provides a detailed account of the metacognitive strategies employed by their participants: The two participants consciously and actively used metacognitive strategies such as planning, controlling, monitoring, evaluating, remediating their comprehension using prior knowledge and contextual clues, and translations.

Bang and Zhao (2007) examined the reading strategies used by advanced Korean and Chinese ESL learners when reading academic texts. The results showed that the Korean readers demonstrated a reliance on dictionaries, habit of translation, and use of personal background knowledge in attempts to comprehend academic texts, all of which

have been identified as characteristics of less skilled readers. Contrastingly, the Chinese participants preferred using contextual clues, discussion with colleagues, and support of peers or teachers as ways of achieving comprehension of academic texts, all of which have been recognized as habits of more skilled readers.

Jimenez et al. (1996) investigated the reading strategies used by bilingual Latino students who were successful English readers. The study reported that on the global level, the successful Latino ESL readers invoked prior knowledge about a topic, made predictions, asked questions, confirmed or disconfirmed their beliefs, or used text structure to organize ideas. On the local level, the readers figured out unfamiliar vocabulary based on the linguistic context by looking for cognates, and by using their knowledge of other similar words in English. The readers also broke down the structure of sentences and tried to identify phrases or chunks that were familiar and comprehensible. The study of Wong et al., (2004, cited in Vianty, 2007) with ESL students reported that the high-level and the low-level readers did not use metacognitive strategies differently although they differed in terms of their awareness and knowledge of metacognition.

2.5. Comparing strategy use in L1 and L2

There is another growing body of research that compares strategic behavior between L1 and L2 reading. Block's (1986) study showed that both ESL readers and native speakers appeared to use similar strategies. A further study by Block (1992) also illustrated that the L1 and L2 readers of English had similar comprehension- monitoring processes while reading expository texts.

Carrell (1989) investigated the metacognitive strategy use of L1 and L2 readers and found that L2 readers in more advanced levels used more 'global' processes or 'top-down' strategies while less proficient readers used more 'localized' processes or 'bottom-up' strategies. Schoonen et al. (1998) investigated metacognition, vocabulary knowledge in L1 and L2 reading comprehension of 685 Dutch students in grade six, eight and ten with the use of a grade appropriate reading comprehension test, vocabulary tests in their native language and English and a metacognitive strategy questionnaire. Results found that for older students (grade eight and ten), metacognitive knowledge appeared to play a significant role in both L1 and L2 reading comprehension with better students spontaneously applying or transferring their metacognitive knowledge while performing reading assignments in a foreign language. Vianty (2007) investigated Indonesian students' metacognitive reading strategies when reading in both English and Bahasa Indonesia with the use of a metacognitive reading strategy inventory. Results revealed that on average, students reported using some of the analytic reading strategies (evaluating reading goals, inferring information) more frequently when reading in Bahasa and used pragmatic reading strategies (physical actions such as underlining, and highlighting) more frequently when reading in English.

2.6. Strategy use by good and poor readers

Research investigating metacognitive awareness in reading comprehension in the L1 context has differentiated between skilled or good and unskilled or poor readers. Paris and Jacobs (1984) illustrate the differences between these types of readers: 'Skilled readers often engage in deliberate activities that require planful thinking, flexible strategies, and periodic self-monitoring' (p. 2083). They use problem solving strategies such as thinking about the topics, looking forward and backward in the passage, and checking their own understanding as they read; poor readers do not employ these skills (Paris & Jocobs, 1984). According to Baker (2002), effective readers employ problem solving and troubleshooting routines to enhance their understanding. Good readers are more likely to make inferences, solve problems, construct coherent mental models and develop a deep understanding of the information in the text while poor readers cannot do all these (McNamara, 2007). Skilled readers, according to Snow et al. (1998), are good comprehenders. They differ from unskilled readers in 'their use of general world knowledge to comprehend text literally as well as to draw valid inferences from texts, in their comprehension of words, and in their use of comprehension

monitoring and repair strategies' (p.62). Pressley and Afflerbach (1995) have pointed out that efficient readers are strategic or 'constructively responsive' readers who carefully orchestrate cognitive resources when reading. For example, they appear to be aware of what and why they are reading; they possess a set of tentative plans or strategies for handling potential problems and for monitoring their comprehension of textual information. Similar results were obtained by Mokhtari and Reichard (2002), who found that the better readers used metacognitive reading strategies more often than the poor readers.

In contrast, unskilled or poor readers lack metacognitve knowledge about reading (Paris & Winograd, 1990). They hardly monitor their own memory, comprehension and other cognitive tasks (Flavell, 1979; Markman, 1981) and reading for them is a decoding process rather than a meaning-getting process (Baker & Brown, 1984). Further, they are less likely to identify contradictions or resolve inconsistencies in text comprehension (Snow et al., 1998). In addition, since poor readers do not realize that they do not comprehend the text, (Garner & Reis, 1981), they are unsuccessful in exercising control of their own reading processes (Wagner & Sternberg, 1987).

2.7. Strategy Use by L2 learners in EFL contexts

Another line of research has centered on metacognitive and perceived reading strategy use by EFL learners. Zhang (2000) investigated 312 Chinese EFL readers' perceived use of reading strategies using a reading strategy inventory. His findings were similar to those of Carrell (1989) in that the better readers reported using 'global' strategies such as gaining meaning through inferences more frequently, while the poor readers reported the use of 'local' strategies such as detailing word meanings. In a further study, Zhang (2002) investigated 10 Chinese EFL university students' metacognitive knowledge of reading strategies with the use of semi-structured interviews. According to the findings, high proficiency students had stronger metacognitive knowledge of the utility of global strategies such as skimming, guessing through inferences, and anticipating, and they tended to have a stronger awareness of using them whereas low proficiency students lacked these strategies, but relied heavily on decoding and linguistic knowledge than on checking the usefulness of the strategies. Saricoban (2002) observed a group of successful and less successful readers in an EFL context throughout pre-reading, reading and post-reading stages. He notes that successful readers use a combination of global and local strategies and suggests that teachers instruct students to construct a global understanding of a given reading material. Ono et al. (2001) investigated the use of reading strategies by 184 EFL university students in three proficiency levels using a reading questionnaire, think-aloud protocols and self-reports; they found that good readers used both top-down and bottom-up strategies effectively and interactively while poor readers found it difficult to effectively use either top-down strategies or bottom-up strategies due to lack of sufficient knowledge of vocabulary and grammar; they claim that rather than teaching top-down strategies, students need to achieve a higher level of bottom-up processing by acquiring sufficient knowledge of vocabulary and grammar in order to be able to utilize top-down strategies.

Another line of research has focused on test takers' metacognitive and strategy use: Phakiti (2003) investigated the metacognitive and cognitive strategy use of 384 Thai university EFL test takers in relation to EFL reading text performance with the use of a reading comprehension test, a metacognitive and cognitive questionnaire and retrospective interviews. Her conclusion was that across the achievement groups, the use of cognitive and metacognitive strategies by the test takers differed qualitatively and quantitatively and the relationship between EFL learners' reading performance and their cognitive and metacognitive strategy use is multidimensional and complex; therefore, alternative assessment instruments would be needed to investigate test takers' metacognitive and cognitive strategies.

2.8. Reading strategy use while reading different texts

Researchers have demonstrated that different texts types may account for different reading strategy use. Studies

in the L1 context examining the reading strategies of good and poor readers have differentiated the use of strategies pertaining to text type. Golincoff (1975) claims that poor readers read all types of texts in the same manner. In the same vein, Jimenez et al. (1996) show that less successful bilingual readers approach narrative and expository texts in similar ways. Daoud (1991) investigated the difficulties experienced by Arabic and French native speakers when reading English texts. He found that readers paid little attention to metatext (author's purpose, audience); there was a lack of flexibility at both rhetorical stylistic levels, and students displayed an incomplete, fragmented and sometimes inappropriate mental representation of the texts.

2.9. Instruments to measure metacognitive awareness and perceived use of reading Strategies

In early research done in L1 contexts, verbal protocol analysis (Bereiter & Bird, 1985; Pressley & Afflerbach, 1995) was first used for assessing the reading processes of L1 readers. In addition, interviews regarding strategies they use (Myers & Paris; 1978; Pereira-Laird & Deane, 1997), 'error detection paradigm' (Baker, 1979; Paris, 1991; Garner, 1992; Otero, 1998; Kinnunen & Vauras, 1995), anecdotal records and observations (Rhodes, 1993; Rhodes & Shanklin, 1993) and student self-assessment (Baker & Cerro, 2000; Leipzig & Afflerbach, 2000) have been used in previous research to measure readers' reading processes. The widely used instruments have been multiple-choice questionnaires. Among the questionnaires utilized to assess metacognitive/ perceived reading strategies, the Index of Reading Awareness (IRA) with 22 items, developed originally as a research tool by Paris and Jacobs (1984), was recommended for use by classroom teachers as an informed instrument to measure elementary school children's metacognitive awareness; Schmitt (1990) developed a 12 item multiple-choice questionnaire to measure elementary students' awareness of strategic reading processes; Miholic's (1994) 10-item multiple-choice inventory aimed at stimulating students' metacognitive awareness of reading strategies for junior high school students; Pereira-Laird and Deane (1997) used a Reading Strategy Use (RSU) questionnaire to assess the perceptions of adolescent students' use of cognitive and metacognitive strategies when reading narrative and expository texts; Kolic-Vehovec and Bajsanski (2001) developed a self-report measure to examine readers' awareness of their own cognitive processes i.e., perception of the use of reading strategies during reading. The metacognitive reading strategy questionnaire (MRSQ) by Taraban et al., (2004) includes an analytic-cognitive component which aimed at reading comprehension, and a pragmatic-behavioral component which aimed at academic performance. A Metacognitive Awareness of Reading Strategies Inventory (MARSI) by Mokhtari and Reichard (2002) with 30 items aimed to measure adult learners' metacognitive awareness of reading processes. The three factors are 'global' reading strategies with 13 items, 'problem-solving' strategies with 8 items and 'support' reading strategies with 9 items. Global strategies are considered as either 'intentional reading strategies aimed at setting the stage for reading' (Mokhtari & Reichard, 2002, p. 252) such as setting a purpose for reading, previewing the text to know what it is about and its characteristics such as its length and organization before reading, or generalized strategies such as using prior knowledge, comprehension monitoring, critically analyzing and evaluating the information in the text and so forth. Problem solving strategies are a set of reading strategies used to solve problems when comprehension failure occurs. Examples of these are re-reading, guessing the meaning of unknown words, adjusting the reading speed according to the text difficulty and visualizing information. Support strategies, which include strategies such as reading aloud, underlining or circling important information, and taking notes which 'provide the support mechanisms aimed at sustaining responses to reading' (Mokhtari & Reichard, 2002, p. 253).

The questionnaire which was used in this study to assess the metacognitive awareness of reading strategy use of Sri Lankan university students was Mokhtari and Reichard's (2002) MARSI due to several reasons: Guided by the principle that constructing meaning from text is an intentional, conscious and purposeful act, while reading academic materials, this questionnaire has been developed and tested by reviewing an extensive body of recent research literature on metacognition and reading comprehension (Alexander & Jetton, 2000; Baker & Brown, 1984; Garner, 1987; Paris

& Winograd, 1990; Pressley, 2002; Pressley & Afflerbach, 1995). Several researchers (Anderson, 2002; Berkowitz & Cicchelli, 2004) provide evidence that the instrument is a reliable and valid measure for assessing adult students' metacognitive awareness and perceived use of reading strategies while reading for academic purposes. Similarly, the strategy items cover a wide array of strategies that take place at multiple stages of the reading process; i.e. before, during and after reading. Metacognitive processes in reading clearly take place at all three stages in the reading process. Moreover, the items in the questionnaire were simple and easy for the students to understand. Through this questionnaire, the aim was to identify 'typical' strategies used by Sri Lankan students and to aggregate them into group results.

3. Research context

In Sri Lanka, where English is taught as a second language, about three and a half hours a week in primary and secondary schools and about three to five hours a week in the universities are allocated for teaching/learning English. In most of the universities, the focus is mainly on general English proficiency; however, ESP courses are also offered by some universities. For many Sri Lankan university students, not only general proficiency in English, but also proficiency in English for academic or specific purposes, plays an important role. Reading is an important skill for the university students since they have to read some of the English reference materials in order to gain more knowledge of their specific subject areas. Although it is generally believed that the processes involved in L1 and L2 reading are similar, reading in the L2 could be less successful for an L2 reader due to factors such as the level of their reading proficiency, types of texts, tasks demands and the difficulty of texts. In such a context, Sri Lankan university students may process texts in different ways depending on their background knowledge, their interests/purposes to read in the L2, their attitudes towards L2 reading and L2 materials and their proficiency levels; in other words, they may use different metacognitive strategies to comprehend L2 texts when comprehension failure occurs.

4. Method

4.1. Participants
The sample in this study consisted of a total number of 166 participants studying in four Sri Lankan universities. All the participants had been learning English for nearly 10-12 years by the time of the data collection. These students, selected from the first, second and third years of these four universities, were majoring in different sub-disciplines in humanities, social sciences and management faculties. The participants were divided into three reading proficiency levels: Low, intermediate and high according to the scores obtained for a reading comprehension test. The total sample included students from 44 low, 88 intermediate and 34 high reading proficiency levels. Table 1 shows the demographic details of the participants in the study.

Table 1: Details of the Participants

Text comprehension Level	Male	Female	Total
Low Level	22 (27%)	22 (27%)	44 (27%)
Intermediate Level	41 (49%)	47 (56%)	88 (53%)
High Level	20 (24%)	14 (17%)	34 (20%)
Total	83	83	166

4.2. Instruments used for data collection

The following instruments were used for data collection and they were administered in the students' regular class time.

1) The reading comprehension test - The reading comprehension test was a 45 minute-test which included 40 multiple choice questions on 4 reading texts with an average of 300 words in each text. The first text included ten 'fill in the blanks' questions and students were asked to underline the most appropriate word, selecting from among the 4 choices given within brackets. The other three passages included another 30 questions with 10 multiple choice questions for each text which were similar to TOEFL and the participants were asked to underline the most appropriate answer selecting from among the four multiple choices. This test was used to divide the participants into three text comprehension levels.

2) The metacognitve strategy questionnaire – The Metacognitive Awareness of Reading Strategies Inventory (MARSI) by Mokhtary and Reichard (2002) was used to assess metacognitive awareness of perceived use of reading strategies of the participants with the use of 5 Likert items from 'I always use' to 'I never use'. The questionnaire, with 30 items translated into Sinhala language, was administered to the students in different universities during the regular English classes. The internal consistency reliability of questionnaire items as measured by Cronbach's alpha was .92 which can be considered as a high reliability score.

3) The background questionnaire – The demographic details of the participants were obtained with the use of a background questionnaire which was administered after the metacognitive strategy questionnaire.

4.3. Data analysis

To analyze the data, descriptive and inferential statistics were computed using the SPSS version 14.0. A 3×3 way ANOVA was computed with three different categories of metacognitive strategies and three levels of text comprehension to establish any significant differences among Sri Lankan students' metacognitive awareness of reading strategy use and their text comprehension levels. Tukey's post hoc test was conducted to identify specific differences; to determine the significance, a standard of p<.05 was used throughout the study.

5. Results

5.1. Research question

What is the relationship between Sri Lankan university students' metacognitive awareness of reading strategies and their text comprehension levels?

The main purpose of the study was to find out the significant differences in metacognitive awareness of L2 reading strategies among the students in low, intermediate and high text comprehension levels. As shown in Table 2, ANOVA results indicated that there was a significant difference in the text comprehension amongst high level students (M=29.21, SD=3.00), intermediate level students (M=19.86, SD=3.33), and lower level students (M=10.14, SD=2.51), $F(2,165) = 374.68$, $p =.000$ with a large effect size (eta squared =.821). Tukey's post hoc tests showed that high level students scored significantly higher than those in the intermediate and low levels, $p =.000$, intermediate level students scored significantly higher than those in the lower level, $p =.000$.

Similarly, ANOVA results indicated that there was a significant difference in metacognitive awareness of reading comprehension amongst the high level students (M=3.58, SD=.52), intermediate level students (M=3.46, SD=.51), and lower level students (M=2.95, SD=.56), $F(2,165)= 14.87$, $p=.000$. The effect size was larger (eta squared=.154). Tukey's post hoc comparisons showed that high level students' metacognitive awareness of reading strategies were significantly higher than that of the low level students, p<.05, whereas there was no significant difference between the

high and the intermediate level students.

According to ANOVA results, significant differences were observed in Sri Lankan students' awareness of global strategies amongst students in the high text comprehension level (M=3.64, SD=.58), the intermediate level (M=3.48, SD=.61) and the lower level (M=2.98, SD=.54), $F(2,166) = 18.27$, $p =.000$ with a large effect size (eta squared=.183). According to the post hoc comparisons, there was a significant difference between the high level students and the low level students in their awareness of global strategies, $p<.05$, whereas the high and the intermediate level students did not differ significantly in this area.

Similarly, significant differences were shown in problem solving strategies amongst the students in the high level, (M=3.88, SD=.67), in the intermediate level, (M=3.77, SD=.61), and in the lower level, (M=3.09, SD=.66), $F(2,166)=20.47$, $p=.000$ with a large effect size (eta squared = .201). Post hoc tests indicated that the higher level students were more aware of problem solving strategies than the low level students, and the difference was significant whereas there were not any statistically significant differences among the students in high and intermediate levels.

With regard to the support strategies, there were also significant differences among the students in the high level (M= 3.23, SD=.68), the intermediate level (M=3.16, SD=.59), and the lower level (M=2.79, SD.70), $F(2,166)=6.37$, $p=.000$ with a small effect size (eta squared=.072). Post hoc comparisons showed that in a similar way to other two strategy categories, the higher level students were more aware of support strategies than the lower level students (p<.05); however, the higher level students' awareness of support strategies did not differ significantly with that of the intermediate level students.

Table 2: ANOVA Results

Variable	Low (N= 44)	Intermediate (N=88)	High (N=34)	F(2, 166)	Effect size[3]
Text comprehension	10.14(2.51)	19.86(3.33)	29.21(3.00)	*374.68****	*.821*
Total metacognitive strategies[2]	2.95(.56)	3.46(.50)	3.58(.52)	*14.87****	*.154*
Global strategies	2.98(.54)	3.48(.61)	3.64(.58)	*18.27****	*.183*
Problem solving strategies	3.09(.66)	3.77(.61)	3.88(.67)	*20.47****	*.201*
Support strategies	2.79(.70)	3.16(.59)	3.23(.68)	6.37**	.072

***p<, 001, ***p<, 000.
[2] The total mean scores of global, problem solving and support strategies
[3] Eta squared.

According to the individual strategy item analysis, the only metacognitve strategy which was statistically significant between the intermediate and the high level students was guessing the meaning of unknown words/phrases. No significant differences were observed in the use of other strategy items among the students in the intermediate and the high levels. However, it should be emphasized that the high level text comprehenders reported using most of the strategies much more frequently than those in the intermediate level, except for a few strategies which were used more frequently by students in the intermediate level. For example, the intermediate level students were metacognitively aware of reading strategies such as using prior knowledge (M=3.82, SD=.94), reading slowly and carefully to understand texts (M=3.99, SD=.97) reading aloud when the text becomes difficult (M=3.08, SD=1.21), and discussing with others to check understanding (M=2.88, SD=.98). This indicates a curvilinear relationship between metacognitive awareness of these few reading strategies and the text comprehension level of Sri Lankan university

students with the intermediate level students employing some metacognitive strategies more often than the high and the low level students. On the other hand, significant differences were found in the use of most global and problem solving strategies between the high and the low comprehenders. However, in the use of some support strategies, no significant differences were found among the three groups. For example, in the use of strategies such as making notes while reading, reading aloud when the text becomes difficult, summarizing, discussing with others to check understanding, paraphrasing, no significant differences were found across the three groups. It was also observed that some strategies such as summarizing to reflect on important information in the text, discussing with others to check comprehension, questioning were rarely used by the low level comprehenders and not often used by the intermediate and the high level comprehenders.

Based on the interpretation schemes used in published instruments with 5 Likert scale items (eg. Oxford, 1990) three levels of usage were identified: high (mean of 3.5 or higher), medium (means of 2.5 to 3.4) and low (2.4 or lower). According to these standards, the metacognitive awareness of reading strategy use was in the lower end of the higher use range (M=3.58, SD=.52) for high level text comprehenders, whereas it was at the higher end of the medium use range for intermediate level students (M=3.46, SD=.51), and at the lower end of the medium use range for the low level students (M=2.95, SD=.56).

The findings of the individual strategy use item analysis showed that similar kinds of reading strategies were used by all three groups with more frequent use by the high level text comprehenders. Almost all Sri Lankan students used tables, figures and pictures in the text to increase understanding (M=3.81, SD=.98), used their prior knowledge in comprehending texts (M=3.70, SD=.94), and guessed what the material was about when reading (M=3.76, SD=.94), with higher level students using these strategies more often than the students in the lower levels.

What are the strategies that the high comprehenders most frequently use? Guessing the meaning of unknown words (M=4.24, SD=.78), re-reading to increase understanding (M=4.00, SD=.82), adjusting the reading speed according to text types (M=4.00, SD=1.10), getting back on track when loosing concentration (M=3.97, SD=.94), visualizing information (M=3.76, SD=.99), reading slowly and carefully to comprehend texts (M=3.74, SD=1.14) were some of problem solving strategies the higher level students reported. Among the global strategy items, the high level students reported high frequent use in using tables, figures and pictures to increase comprehension (M=3.97, SD=.1.06), guessing what the material is about when reading (M=3.97, SD=.90), checking their understanding when coming across conflicting information (M=3.79, SD=.91), previewing the English text to see what it is about before reading it (M=3.79, SD=1.01.), using prior knowledge (M=3.74, SD=.1.08), setting a purpose for reading (M=3.68 SD=.91) and using context clues and typographical aids to identify key information (M=3.56, SD=.96). With regard to support strategies, using reference materials such as dictionaries (M=4.03, SD=.97), underlining or circling important information (M=3.88, SD=1.09), paraphrasing to better understand the text (M=3.38, SD=1.10), taking notes while reading (M=3.26, SD=1.08) were some of the strategies the good comprehenders often used.

Among the intermediate level comprehenders, the same patterns of metacognitive awareness of reading strategies were observed similar to that of the higher level students. The only difference was that they reported using the same strategies less frequently than the higher levels students and more frequently than lower level students. However, some differences were observed in the use of problem solving strategies: The most frequently used problem solving strategy items for the intermediate level students were reading slowly and carefully to understand the text (M=3.99, SD=.97), paying closer attention to what they were reading when comprehension becomes difficult (M=3.88, SD=1.03), getting back on track when losing concentration (M=3.86, SD=.95), adjusting their reading speed according to the text type (M=3.83, SD=.91), re-reading for better comprehension (M=3.77, SD=1.07) and guessing the meanings of unknown words/ phrases (M=3.76, SD=1.09). With regard to global strategy items, the intermediate students reported using strategies such as using tables, figures and pictures to increase their understanding (M=3.91, SD=.1.02), guessing what

the material is about (M=3.85, SD=.98), using prior knowledge (M=3.82, SD=.94) and previewing texts to see what it is about before reading (M=3.69, SD=1.08). Among the support strategy category, the intermediate students reported using dictionaries more often (M=4.10, SD=.96) and underlining or circling important information (M=3.74, SD=1.11).

Similarly, the same pattern of metacognitive awareness of reading strategies could be observed among the low comprehenders with less frequent use of strategies than intermediate and high level learners. The least used strategy items reported by all Sri Lankan students were critically analyzing and evaluating the information presented in the text (M=2.86, SD=1.12), self-questioning (M=2.64, SD=1.03), summarizing (M=2.70, SD=1.15) and discussing with others to check understanding (M=2.83, SD=.95).

6. Discussion

The aim of the study was to investigate the metacognitive strategy use of Sri Lankan university students in three proficiency levels. Results show a positive linear relationship between Sri Lankan university students' text comprehension levels and their metacognitive awareness of reading strategies. It indicates that the higher the level of text comprehension among the students, the greater their awareness of metacognitive reading strategy use while reading academic/general texts. It is interesting to find that Sri Lankan university students in all text comprehension levels used problem solving strategies mostly followed by global and support strategies respectively. Similarly, the higher level students used all metacognitive strategies more often than the students in the intermediate and the low levels although no statistical differences in use of all metacognitive strategies except one between the intermediate and the high level students were found. Furthermore, the intermediate students used metacognitive strategies more often than those in the lower level. The findings of this study support those of the previous studies done in L1, L2 and EFL contexts (Li & Munby, 1996; Mokhtari & Reichard, 2002), that advanced or higher reading proficiency level students employ metacognitive strategies more frequently than those in the intermediate or lower levels. The results showed that a positive linear relationship appeared between the individual strategy use and the students' text comprehension level. However, we could infer that Sri Lankan advanced university readers use a repertoire of metacognitive strategies in order to comprehend text whereas the low level readers find it difficult to effectively use those strategies. Almost all strategies used by the low level readers were in the lower use range except a few reading strategies which were at the lower end of the medium use range while most of the high and the intermediate level students were aware of problem solving strategies which help them establish an action plan that allows them to utilize effective use of strategies for comprehension. The strategies the more advanced group used were considered as focused specific problem solving strategies or repair strategies when problems develop in understanding textual information. Therefore, in order to repair their comprehension difficulty, they use repair strategies such as reading slowly and carefully to understand the reading materials, checking understanding when encountering conflicting information, re-reading for better understanding, adjusting their reading speed according to the difficulty of the text, guessing meaning of unknown words and phrases and visualizing information to increase their understanding. In contrast, the low level students appeared to lack their ability in using these strategies appropriately and effectively when comprehension failure occurs. The findings of this study are similar to most of the studies done in L1 and L2 contexts with regard to good and poor readers in that better readers use problem solving strategies to enhance their comprehension (Baker & Brown, 1984; McNamara, 2007), draw valid inferences from texts, and possess a set of strategies for handling potential problems and monitoring their comprehension of textual information (Pressley & Afflerbach (1995); in contrast, unskilled readers lack metacognitive knowledge about their reading processes (Paris & Winograd, 1990) and are unsuccessful in exercising control of their reading processes (Wagner & Sternberg, 1987).

The next strategy category Sri Lankan students most frequently used was global strategies. All Sri Lankan

students are aware of these strategies and most of the intermediate and the high level text comprehenders used these global strategies more frequently such as predicting, setting a purpose in reading, using prior knowledge, previewing the texts before reading, deciding what to read closely and what to ignore, checking to see if their guesses about the text are right or wrong. On the other hand, though the lower levels comprehenders were aware of these strategies, they still need proper guidance in using these strategies effectively. This finding also supports the findings of the previous studies in that better readers were reported using more global strategies (Carrell, 1989; Zhang, 2000) such as skimming, guessing through inferences, and anticipating. Moreover, monitoring and checking one's own cognitive activities to verify whether comprehension is taking place is one of metacognitive strategies skilled readers employ to enhance their text comprehension (Baker & Brown, 1984, Palinscar & Brown, 1984, Theid & Anderson, 2003). This is true with Sri Lankan advanced text comprehenders who reported using this strategy much more frequently than the intermediate and the low level groups. On the other hand, the fact that the low level Sri Lankan students used these strategies less frequently appears to be true with Yang's (2002) and Ono et al., (2001) claim that if readers possess higher language knowledge, his/her comprehension monitoring operates at a higher level leading to higher level text comprehension. Therefore, sufficient knowledge of vocabulary and grammar is a pre-condition for any reader to monitor their comprehension and enhance their text comprehension.

The least used strategy category for all Sri Lankan students were support strategies. In spite of the fact that the higher level text comprehenders use more top-down strategies in comprehending L2 texts, they mostly rely on the use of dictionaries to better understand L2 texts. They also used support strategies such as underlining or circling important information in the text, reading aloud when the text become difficult, paraphrasing to better understand texts and going back and forth to find relationships among ideas in the text. On the other hand, the low level readers seemed weak in employing these strategies to enhance their text comprehension. These findings of this study also support the findings of the previous studies (Saricoban, 2002; Ono et al., 2001).

However, we can infer that the higher level text comprehenders seemed to lack effective use of some metacognitive strategies such as self-questioning, critically analyzing and evaluating the information presented in the text, understanding through discussion, summarizing and so forth since their use of these strategies was low. It appears that Sri Lankan higher level students are more aware of some of the effective metacognitive strategies but lack the knowledge of how and when to use some other effective strategies in understanding texts. Similarly, we could assume that some skilled readers tend to use specific strategies effectively for better comprehension rather than concentrating on strategies such as summarizing, discussing with others and so forth. In spite of this, the general findings of this study were similar to most of the studies done in L1 and L2 contexts in that better readers use a set of problem solving strategies such as drawing valid inferences, using prior knowledge, monitoring comprehension of textual information, re-reading to increase their understanding, going back and forth to find relationships among the ideas in the text to handle potential problems and monitoring their comprehension of textual information (Baker & Brown, 1984, McNamara, 2007). The findings of this study also support the claim raised by some of the previous researchers (Wong, Chang and Hong, 2004, cited in Vianty, 2007) that both skilled and unskilled ESL readers did not use metacognitive strategies differently though they differed in terms of their awareness and knowledge of metacognition in reading L2 texts.

7. Pedagogical implications and further research

The findings of the study have a number of implications for classroom pedagogy. If higher level readers tend to have more metacognitive knowledge than the lower level students, then it is important to consider how the lower level students might be encouraged to use these strategies. In a variety of empirical studies, researchers have produced

evidence to support interventions on explicit multiple strategy instruction rather than concentrating on single strategy instruction, including comprehension monitoring (Boulware-Gooden et al., 2007; Cubukcu, 2008; Dehieb-Heina, 2003; Shen & Huang, 2007). Such interventions have included the teaching of multiple strategies explicitly promoting metacognitive awareness for flexible strategy use when comprehension fails. In Sri Lankan case, students could be taught with teaching modeling with consistent guided practice based on discussion on how, when and why to use effective strategies so that students could learn how to regulate their comprehension once failure of comprehension occurs. However, according to Baker (2002), the teaching of metacognition may be integrated with comprehension instruction rather than teaching it in isolation or promoting it as a goal in itself. Even the intermediate level students could be instructed to use a set of fix-up strategies that skilled readers use such as re-reading, taking notes, using prior knowledge, self-questioning and so forth for better comprehension. Similarly, explicit multiple strategy instruction could be integrated with vocabulary development and complex grammar activities with other collaborative activities using interesting and level appropriate L2 materials. Collaborative teaching and cooperative learning activities are better ways of strategy instruction especially for the students with varying degrees of individual differences. The target group for comprehension instruction may be students with sufficient knowledge of grammar and vocabulary since they are capable of using top-down strategies when guided properly. The low level comprehenders should first acquire a higher level of bottom-up processing by acquiring sufficient knowledge of vocabulary and grammar as Ono et al., (2001) have suggested; then only they will be able to utilize top-down strategies for enhanced comprehension of L2 texts.

Another way of fostering metacognitive awareness among students is to assist them to develop their own abilities to assess and evaluate their own progress in reading: students could be encouraged to keep a journal of the metacognitive strategies (Baker, 2002) they use when they engage in extensive reading outside the classroom and use the strategies taught in the class and to keep a record of what they do when the failure of comprehension occurs, or how they resolve the problems in comprehension. Similarly, they could seek help from their instructors in the classroom when a difficulty in comprehension occurs so that they will also improve their confidence in themselves in requesting clarifications for their problems encountered.

8. Conclusion

The study investigated the relationship between Sri Lankan students' text comprehension levels and their metacognitive awareness of reading strategies. The results showed a positive linear relationship between these two variables indicating that high level text comprehenders were more metacognitively aware of reading strategies than those in the lower level while attempting to comprehend L2 texts. However, this study used only a questionnaire to measure students' metacognitive awareness of reading strategies. Therefore, future research need to include data triangulation using different methods such as use of interviews, students' journals, think aloud protocols in order to have more valid and reliable data. Future research also should use more equal number of males and females representing the sample population in different disciplines, different universities and different ethnic groups to generalize the findings of the results to the target population.

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