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The Use of Cognitive and Metacognitive Reading Strategies in Secondary School Contexts*

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This study explores to what extent cognitive and metacognitive reading strategies are employed by two different learner groups in secondary school contexts: general high school students and vocational high school students. Data were collected using a reading strategy questionnaire. Results showed that there was a similarity between the two learner groups: Memory strategies were the most preferred type, whereas planning strategies were the least frequently used one. Both groups also employed cognitive strategies more frequently than metacognitive strategies. A noticeable difference between the two groups was that the general high school group employed cognitive and metacognitive strategies more frequently than the vocational high school counterpart. Interestingly, the former group exhibited a statistically greater inclination to employ comprehending, memory, retrieval, planning, monitoring, and evaluating strategies than the latter group. Correlation analyses indicated a strong positive correlation between cognitive and metacognitive strategies. A similar trend was evident in the relationship between the six subtypes of reading strategies since comprehending, memory, retrieval, planning, monitoring, and evaluating strategy types were positively correlated with each other. On the basis of the results, pedagogical implications and helpful suggestions were provided to help L2 readers foster their strategic competence.

[reading skills/reading strategies/cognitive/metacognitive/high school]

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I. INTRODUCTION

In second/foreign language classrooms, the importance of reading strategies cannot be overemphasized mainly because their use has been argued to contribute to successful reading comprehension (Alderson, 1984; Hudson, 2007; Zhang & Wu, 2009). Indeed, the common thread running through most studies is that successful readers are those who make effective and active use of different varieties of reading strategies (Phakiti, 2003a, 2006; Purpura, 1997). When readers encounter problems in comprehending reading texts, they tend to employ a myriad of reading strategies to cope adequately with the reading problems. Reading strategies deserve particular attention in Korean secondary school contexts since reading skills occupy a pivotal place in English language teaching and learning, especially in high school classrooms.

The significance of reading strategies has created an explosion of research in ESL and EFL contexts. L2 reading research has divided reading strategies into two major categories – cognitive and metacognitive strategies. The former type involves the test-takers' ongoing mental activities to use their language and world knowledge to solve the given tasks, whereas the latter involves the test-takers' deliberate mental behavior for directing and controling their cognitive strategy processing for successful performance (Phakiti, 2003a). These two types of strategies were reported to have a positive relationship to students' reading comprehension performance (Phakiti, 2003a, 2006; Purpura, 1997, 1998).

While the effectiveness of reading strategies has been borne out by many studies, there are still several important limitations of prior research. First of all, researchers have placed heavy reliance on an investigation into metacognitive strategies (Takallou, 2011), which has left them less interested in probing into cognitive strategies. Even fewer studies have been conducted on the relationship between cognitive and metacognitive strategies, especially in Korean EFL contexts, though considerable attention was drawn to the relationship between reading strategy use and reading test performance (Phakiti, 2003a). More seriously, to date, little or no research has documented a comparison between general high school and vocational high school students in the use of cognitive and metacognitive reading strategies. These shortfalls need to be addressed so that Korean high school students can be well equipped with reading strategies.

The present study, therefore, delves into Korean high school students' use of cognitive and metacognitive strategies. The main focus of the research is to explore to what extent the general high school and vocational high school students employ cognitive and metacognitive reading strategies. There are important reasons for the comparison between the two learner groups. In essence, the two groups were studying in different language learning environments. Specifically, the general high schools aimed to prepare students for

the university entrance exam, whereas the vocational high schools aimed to prepare students to enter the workforce of different sectors such as technical and commercial sectors. To attain the different goals, the general high schools and the vocational high schools offer different English curricula, the former focusing on general English courses, while the latter concentrating on ESP (English for Specific Purposes) courses such as 'Technical English' or 'Commercial English'. Furthermore, the general high school students and vocational high school counterparts varied in their linguistic and educational backgrounds and orientation, the former having a wider range of linguistic knowledge than the latter (Jung, 2018). These different language learning environments merit an investigation with particular attention to how the two different groups of students employ cognitive and metacognitive reading strategies. For this purpose, this study addresses the following specific research questions:

(a) Which type of reading strategies do the general high school group and the vocational high school group prefer to use?
(b) Is there any difference between the two learner groups in their use of two overall types of strategies (cognitive and metacognitive)?
(c) Is there any difference between the two learner groups in their use of six subtypes of strategies (comprehending, memory, retrieval, planning, monitoring, and evaluating)?
(d) Is there any relationship between the two overall types of strategies (cognitive and metacognitive)?
(e) Is there any relationship between the six subtypes of strategies (comprehending, memory, retrieval, planning, monitoring, and evaluating)?

II. LITERATURE REVIEW

1. Reading Strategy Use and Reading Test Performance

A huge body of research (e.g. Phakiti, 2003a; Purpura, 1997) has examined the effects of reading strategy use on reading test performance. Some studies have reported a positive effect. For example, Phakiti (2003a) found that the use of cognitive and metacognitive strategies had a positive relationship to the reading test performance. His later study (Phakiti, 2006) confirmed that memory and retrieval strategies facilitated EFL reading test performance via comprehending strategies. Other studies have, however, shown just the opposite. For instance, Purpura (1997) revealed that metacognitive processing had no direct effect on test performance nor did cognitive processing have a significant effect on reading ability.

In Korean EFL contexts, Park (2010) indicated that the Korean college students' reading comprehension ability was to some degree related to their reading strategy use, showing that the higher their reading comprehension ability, the more they used sophisticated reading strategies. In another line of research, Joh (2013) found that there was considerable variation in the relationships between reading strategy use and reading performance depending on the elicitation method. These findings substantiated Purpura's (1997) claim that strategy use affects reading test performance directly in some circumstances but not in others.

2. Reading Strategy Use and English Proficiency

Numerous studies on the role of proficiency in the use of reading strategies have yielded fruitful results. A common finding in this line of research was that more skillful readers tend to use reading strategies more frequently than less skillful counterparts. A similar finding was evident in Phakiti's (2003a) study, which showed that highly successful test-takers reported significantly higher metacognitive strategy use than the moderately successful ones who in turn reported higher use of these strategies than the unsuccessful test-takers. The same held true for Korean EFL high school classrooms where the highly successful group used the cognitive and metacognitive reading strategies more than the lower proficient group, as shown in Yong's (2009) study.

Although these two studies dealt with the use of both cognitive and metacognitive reading strategies, many other studies focused solely on the use of metacognitive awareness of reading strategies. In ESL settings, Mokhtari and Reichard (2002) showed that high-ability readers have a significantly higher use of global and problem-solving reading strategies than low-ability readers. A similar trend was apparent in Zhang's (2001) research in Chinese EFL contexts where the strategic resources reported by the low-proficiency group were particularly limited. This finding was also backed up by many, though not all, of the studies in Korean EFL contexts (e.g. Hong-Nam & Page, 2014; Maeng, 2006) where the more skillful group employed more strategies than the less skillful group. These findings clearly indicate that good readers are more strategic when reading (Hong-Nam & Page, 2014).

However, other studies yielded different results, For example, Purpura (1998) revealed that with the low-ability group, the metacognitive strategies seemed to have a stronger total effect on the cognitive strategy and the test performance variables than with the high-ability test takers. Unlike this study, Anderson (1991) reported that high scorers and low scorers use the same kinds of strategies while taking a standardized reading comprehension test or during academic reading tasks. In Korean EFL classrooms, Jung's (2016) study yielded complex results, showing that the high-level group used global and problem-

solving strategies more than the intermediate and low groups, but the low group used support strategies more than the other two proficiency groups. Park (2013) went so far as to report that L2 proficiency exerted a limited effect. Considering these findings, it seems reasonable to conclude that the use of reading strategies varies depending upon learners' proficiency levels.

3. Reading Strategy Use and Cultural Background

A plethora of research results indicated that cultural background or language background affects second language learning strategy selection and use (Abbott, 2006). Parry (1996), for example, explored how different cultural groups employ bottom-up or top-down reading strategies and reported that Chinese students preferred bottom-up strategies as opposed to Nigerian students who had a strong preference for top-down strategies. Mandarin speakers' preference for bottom-up strategies was evidenced in Abbott's (2006) research, which further revealed that Arabic speakers prefer to choose skimming, connecting, and inferring.

Sheorey and Mokhtari (2001) examined differences in the metacognitive awareness of reading strategies between native and non-native readers and found that the differences between the two groups existed only in the use of support strategies with the non-native readers using them significantly more than the native readers. Attention was also paid to a comparison between ESL and EFL students in their use of reading strategies. In this connection, Anderson (2004) showed that the EFL learners reported a higher use of problem-solving strategies than did the ESL learners. These results taken together suggest that different cultural backgrounds or different language learning environments influence the choice of reading strategies in one way or another.

4. Reading Strategy Use and Gender

Differences in strategy use by gender have been presented with mixed findings (Hong-Nam & Page, 2014). Many researchers reported female students using more strategies in general than male students (Sheorey & Baboczky, 2008). This was analogous to the finding reported by another set of studies in Korean EFL contexts, which found that female students used a wider range of reading strategies than male counterparts (Hong-Nam & Page, 2014; Jung, 2016). In Maeng's (2006) study, the results of gender effect on using reading strategies varied depending on the three different reading stages: pre-reading, during-reading, and post-reading stages.

Unlike these studies, there have been a handful of studies which revealed no significant differences in the use of reading strategies between males and females. This was evidenced

in Sheorey and Mokhtari's (2001) research, which indicated that the ESL sample did not reflect gender effects. Similarly, Young and Oxford (1997) showed that males and females used similar strategies. On the other hand, Phakiti's (2003b) study yielded mixed results, revealing that gender differences exist in the use of metacognitive strategies with males reporting significantly higher use of them than females, but no differences in their use of cognitive strategies. These findings will help teachers to be aware of how gender can affect development and achievement in L2 reading (Phakiti, 2003b).

5. The Effects of Strategy Training

There have been several attempts to provide some guidelines on effective instructions on reading strategy use. Many researchers (e.g. Carrell, Gajdusek & Wise, 1998; Lawrence, 2007; Mokhtari & Sheorey, 2002) argued that effective metacognitive strategy training should include information on what the strategy is, why the strategy should be learned, and how to use the strategy plus when and where the strategy should be used.

On the basis of these guidelines, many studies examined the instructional effects of strategies and found that strategy training produced positive effects on learners' strategic awareness. Carrell, Pharis, and Liberto (1989) reported that metacognitive strategy training is effective in enhancing second language reading, and that the effectiveness of one type of training versus another may depend upon the way reading is measured. The positive effects of strategy training were also evidenced in Korean EFL classrooms. Kweon (2009), for instance, revealed that explicit instruction does affect metacognitive awareness, showing that students reported higher frequency of usage of reading strategies in the post-survey than in the pre-survey. Likewise, Kim and Cha (2014) reported that strategy training was effective in promoting learners' reading proficiency. Along the same line, Chang (2012) confirmed that strategy-based instructions led to a statistically significant increase not only in the use of metacognitive reading strategies but also in the intercultural sensitivity level.

Some research, however, has reported marginal and limited effects of strategy-based instruction on improving EFL reading comprehension. Nairn and Im (2016) revealed that the Korean middle school students possessed a general understanding of EFL strategy use, but overall practice of strategy use was limited due to the restricted opportunities to learn applicable strategies.

To sum up, the previous studies clearly indicate that the type of reading strategies chosen by L2 readers may vary depending upon such variables as proficiency, cultural background, and gender, among others.

III. METHOD

1. Participants

The study was conducted with a total of 266 students. They were divided into two different learner groups: general high school students (123; 46.3%) enrolled in general English courses and vocational high school students (143; 53.7%) enrolled in ESP courses. These students were from four different high schools in the Gyongsang area of Korea, half of them involving general high schools (one boys' and one girls' general high schools) and the other half involving vocational high schools (one commercial and one technical high schools). Detailed distribution of the participants is summarized in Table 1.

TABLE 1

Information of the Participants

Variable		General school	Vocational school	Total
Gender	Male	58 (21.8)	56 (21.1)	114 (42.9)
	Female	65 (24.4)	87 (32.7)	152 (57.1)
Year of study	10th grade	92 (34.6)	36 (13.5)	128 (48.1)
	11th grade	31 (11.7)	107 (40.2)	138 (51.9)
Total		123 (46.3)	143 (53.7)	266 (100)

In terms of gender, the number of females (152: 57.1%) were greater than the number of males (114; 42.9%). The participants were 10th graders (128; 48.1%) and 11th graders (138; 51.9%), the former covering a similar proportion to the latter. However, 12th grade students were excluded in the study because they were busy applying for a university in the case of the general high school students and applying for a job in the case of the vocational high school students.

Their age ranged from 17 for the 10th grade students to 18 for the 11th grade students. These students had been studying English for 10 to 11 years since they started to learn English in their 1st year of elementary school. Only a handful of students had experience in staying in English speaking countries: 6 students in the general high schools and none in the vocational high schools. Their lengths of stay in English speaking countries averaged 2.5 months.

It was hard to measure the students' English proficiency mainly because both groups were taking different types of English tests for different educational purposes. Nonetheless, it is generally acknowledged that the general high school students are more proficient in English than the vocational high school students (Jung, 2018). From an affective perspective, the former group has a higher level of motivation for learning than the latter

(Kim, 2000). As Kim (2000) indicated, the vocational school students' lower level of motivation seems to negatively influence their language proficiency, leading to a limited range of linguistic knowledge. Moreover, the number of class hours devoted to English in the general high schools was greater than that of the vocational high schools in that the former group was taking four English classes per week, while the latter group, three classes in the case of 10th grade students and two classes in the case of 11th grade students per week at the time of the survey. These different learning environments may influence the learners' choice of reading strategies in one way or another.

2. Instrument

While there have been different models of reading strategies (Anderson, 1991; Phakiti, 2006; Purpura, 1998) and there is no agreed-upon taxonomy of reading strategies among researchers (Anderson, 2004), the present study employed a modified version of the questionnaire developed by Phakiti (2006). The main reason for this choice was that it was a recent version of the reading strategy questionnaire and that it included both cognitive and metacognitive strategies, which suited the purpose of the present study. This questionnaire was validated by Phakiti (2006) and employed in a dozen studies in ESL contexts, but rarely used in Korean EFL contexts, which was why the present study employed it.

The questionnaire consisted of two major sections. The first section was designed to collect demographic information about the participants including their type of school, gender, grade, and experience in staying in English speaking communities. The second section was composed of a total of 30 reading strategy items adapted from Phakiti's (2006) questionnaire. The components of the questionnaire are detailed in Table 2.

TABLE 2

The Components of the Strategy Questionnaire

Processing	Subscale	No. of items	Items
Cognitive strategies	Comprehending	5	2, 3, 6, 7, 14
	Memory	4	1, 5, 8, 22
	Retrieval	4	4, 9, 26, 29
Metacognitive strategies	Planning	6	10, 11, 19, 20, 23, 27
	Monitoring	6	12, 16, 17, 21, 24, 25
	Evaluating	5	13, 15, 18, 28, 30

It is important to note at this point that different researchers had their own ways of categorizing strategies, this study followed Phakiti's (2006) categorization, which had been

validated by many other researchers (e.g. Yong, 2009). As shown in the table, cognitive strategies consist of comprehending, memory, and retrieval strategies. Comprehending strategies are those used to hold information in working memory long enough for a person to understand (*e.g. I translated the reading texts into Korean*.). Memory strategies involve making association to store information (*e.g. I made short notes or underlined main ideas during the test*.). Retrieval strategies involve drawing information from memory for use (*e.g. I used my own English structure knowledge to comprehend the text*.) (Phakiti, 2003a; Purpura, 1997). On the other hand, metacognitive strategies cover planning, monitoring, and evaluating. Planning strategies refer to the readers' action of previewing or overviewing (*e.g. I tried to identify easy and difficult tests*.). Monitoring strategies are readers' deliberate action to check their thinking and performance (*e.g. I corrected mistakes immediately when found*.). Evaluating strategies involve evaluating reading progress (*e.g. I carefully checked the answers before submitting the test*.) (Phakiti, 2003a). In the questionnaire, cognitive strategies totaled 13 items (5 comprehending items, 4 memory items, and 4 retrieval items), while metacognitive strategies totaling 17 items covered 6 planning items, 6 monitoring items, and 5 evaluating items.

While Phakiti's (2006) original version was written in English, the adapted version used in the current study was given in Korean in order to avoid misunderstanding and confusion by preventing language problems in measuring their cognitive and metacognitive strategy use (Phakiti, 2006). Unlike Phakiti's (2006) original version, which was written using the simple past tense, the questionnaire used here was written using the simple present tense as it intended to ask students about their general perceived strategy use (Yong, 2009) rather than about their use of strategies specific to a particular reading test.

Prior to administering the questionnaire survey, the questionnaire items were piloted with four high school students, half of them from the general high schools and the other half from the vocational high schools. This pilot study helped to confirm the feasibility of the questionnaire items by changing inadequately worded items more naturally and clearly.

In order to verify the reliability of each strategy type in the questionnaire, internal consistency was measured using Cronbach's alpha. Its results are presented in Table 3.

TABLE 3

Reliability of Reading Strategy Types

Type	Cronbach's α	Type	Cronbach's α
Cognitive	0.879	Metacognitive	0.913
Comprehending	0.702	Planning	0.774
Memory	0.722	Monitoring	0.805
Retrieval	0.756	Evaluating	0.767

As indicated in the table, all of the subcategories produced Cronbach's alpha value over 0.7, which is indicative of desirable internal consistency, which in turn suggests that the questionnaire items were valid.

3. Procedure and Data Analysis

The questionnaire survey was administered during the spring semester of 2019 academic year with cooperation from four high school English teachers, half of them teaching in the general high schools and the other half in the vocational high schools. The teachers explained to their students the purpose of the survey and conducted it in class. The participants were guided to read reading strategies in the questionnaire and indicate how often they use each item when taking reading comprehension tests. Specifically, they were instructed to choose one of the five options on a 5-point Likert scale: 1. *Never use it;* 2. *Rarely use it;* 3. *Sometimes use it;* 4. *Often use it;* 5. *Very often use it*. This scale was used to gauge to what extent the readers use each strategy.

A multitude of copies of the questionnaire (280 copies) were distributed to the students, but only 274 copies were returned. Out of them, 8 copies were found to be incomplete and thus they were excluded from the data analysis. Finally, 266 copies were analyzed to address the research questions. While there was no time limit on completing the survey, it took between 15 and 20 minutes to do so.

Data analysis was carried out using IBM SPSS Statistics 25 package. Since the main focus of this research was on the comparison between the two learner groups (the general high school group and the vocational high school group) in their use of reading strategies, an independent samples *t*-test was used in large part to determine whether there is any difference between the two groups. In addition, correlation analyses were used to test the potential relationship between cognitive and metacognitive reading strategies.

IV. RESULTS

1. Learners' Preference for Reading Strategies

It is vital to present descriptive statistics on the learners' use of cognitive and metacognitive strategies to identify which type of strategies is most frequently used and which one is least frequently used out of the six subtypes of strategies. This is shown in Table 4.

TABLE 4

Descriptive Statistics on Reading Strategies

Group	Type	Subtype	*N*	*Min*	*Max*	*M*	*SD*
General high school	Cognitive	Comprehending	123	2.25	4.75	3.63	0.61
		Memory	123	2.50	5.00	3.82	0.58
		Retrieval	123	2.00	5.00	3.68	0.61
		Sub-total	123	2.50	4.83	3.71	0.50
	Metacognitive	Planning	123	2.00	4.67	3.42	0.59
		Monitoring	123	2.33	5.00	3.52	0.61
		Evaluating	123	2.20	5.00	3.69	0.58
		Sub-total	123	2.47	4.71	3.54	0.52
	Total		123	2.62	4.62	3.61	0.48
Vocational high school	Cognitive	Comprehending	143	1.00	4.50	3.03	0.76
		Memory	143	1.00	5.00	3.16	0.88
		Retrieval	143	1.00	4.75	2.94	0.83
		Sub-total	143	1.33	4.25	3.05	0.74
	Metacognitive	Planning	143	1.17	4.17	2.86	0.67
		Monitoring	143	1.00	4.67	2.93	0.77
		Evaluating	143	1.00	4.80	3.11	0.82
		Sub-total	143	1.24	4.18	2.96	0.69
	Total		143	1.31	4.21	3.00	0.67

As shown in the table, the most sought-after type of strategies was exactly the same for both the general high school and vocational high school groups, that is, memory strategies ($M = 3.82$ for the former group and $M = 3.16$ for the latter). This indicates that the two high school groups tend to rely heavily on highlighting important parts, underlining main ideas, and re-reading information as they read.

Interestingly enough, the least common type was also the same for the two learner groups, who reported employing planning strategies least frequently ($M = 3.42$ for the general high school group; $M = 2.86$ for the vocational high school group). This suggests that the two learner groups paid the least attention to such strategies as planning how to complete a reading test, identifying easy and difficult test items, being aware of the need to plan a course of action, and clarifying the goal and knowing how to complete it, among others.

2. Differences Between the General and Vocational School Groups

In order to measure whether there are any differences between cognitive and metacognitive strategies used by each learner group, a paired samples *t*-test was performed, as indicated in Table 5.

TABLE 5

Cognitive and Metacognitive Strategies Used by Each Learner Group

Group	Type	*N*	*M*	*SD*	*MD*	*t*	*p*
General	Cognitive	123	3.71	0.50	.18	5.844 ***	.000
	Metacognitive	123	3.54	0.52			
Vocational	Cognitive	143	3.05	0.74	.09	2.378 *	.019
	Metacognitive	143	2.96	0.69			
Total	Cognitive	266	3.35	0.72	.13	5.320 ***	.000
	Metacognitive	266	3.23	0.68			

***$p < .001$, *$p < .05$

There were statistically significant differences between cognitive and metacognitive strategies for the general high school group ($t = 5.844$; $p < .001$) and for the vocational high school group ($t = 2.378$; $p < .05$). In other words, the general high school group reported using cognitive strategies ($M = 3.71$) more often than metacognitive strategies ($M = 3.54$). By the same token, the vocational high school group gave significantly higher preference rating for the use of cognitive strategies ($M = 3.05$) than for the use of metacognitive strategies ($M = 2.96$). When the number of the two learner groups was combined, the learners' use showed a similar tendency in that statistically significant differences existed between cognitive and metacognitive strategies ($t = 5.320$; $p < .001$), which indicates that cognitive strategies ($M = 3.35$) were used more frequently than metacognitive strategies ($M = 3.23$).

Another inquiry in this study is whether there are any differences between the two groups in the use of cognitive ad metacognitive strategies, respectively. This was examined by running an independent samples *t*-test. The outcome of the *t*-test is encapsulated in Table 6.

TABLE 6

The Use of Cognitive and Metacognitive Strategies by Learner Group

Type	Group	*N*	*M*	*SD*	*t*	*p*
Cognitive	General	123	3.71	0.50	8.775 ***	.000
	Vocational	143	3.05	0.74		
Metacognitive	General	123	3.54	0.52	7.794 ***	.000
	Vocational	143	2.96	0.69		

***$p < .001$

As illustrated in the table, statistically significant differences were evident between the two learner groups in the use of cognitive ($t = 8.775$) and metacognitive ($t = 7.794$) strategies, respectively, at the significance level of .001. Cognitive strategies were favored

by the general high school group (M = 3.71) more greatly than by the vocational high school group (M = 3.05). The same held true for the use of metacognitive strategies in the sense that the general high school group (M = 3.54) showed a stronger preference for metacognitive strategies than the vocational high school counterpart (M = 2.96).

A t-test was also calculated to answer another research question as to whether there are any differences between the two learner groups in the use of six subtypes of reading strategies, Table 7 displays the results of an independent samples t-test on this issue.

TABLE 7

The Use of Six Subtypes of Reading Strategies by Learner Group

Type	Group	*N*	*M*	*SD*	*t*	*p*
Comprehending	General	123	3.63	0.61	7.098	.000
	Vocational	143	3.03	0.76	***	
Memory	General	123	3.82	0.58	7.320	.000
	Vocational	143	3.16	0.88	***	
Retrieval	General	123	3.68	0.61	8.382	.000
	Vocational	143	2.94	0.83	***	
Planning	General	123	3.42	0.59	7.124	.000
	Vocational	143	2.86	0.67	***	
Monitoring	General	123	3.52	0.61	7.065	.000
	Vocational	143	2.93	0.77	***	
Evaluating	General	123	3.69	0.58	6.747	.000
	Vocational	143	3.11	0.82	***	

***p < .001

Upon closer analysis of each strategy type, it was shown that statistically significant differences occurred between the two learner groups in all six subtypes of strategies at the significance level of .001 (t = 7.098 for comprehending strategies; t = 7.320 for memory; t = 8.382 for retrieval; t = 7.124 for planning; t = 7.065 for monitoring; t = 6.747 for evaluating). Specifically, the general high school students exhibited a statistically greater inclination to employ all six subtypes of reading strategies than the vocational high school group: (a) the former group (M = 3.63) vs. the latter (M = 3.03) for comprehending; (b) the former (M = 3.82) vs. the latter (M = 3.16) for memory; (c) the former (M = 3.68) vs. the latter (M = 2.94) for retrieval; (d) the former (M = 3.42) vs. the latter (M = 2.86) for planning; (e) the former (M = 3.52) vs. the latter (M = 2.93) for monitoring; and (f) the former (M = 3.69) vs. the latter (M = 3.11) for evaluating. These results clearly indicate that the general high school students are distinguished from the vocational high school students in strategic knowledge, showing that the former group's use of strategies outstrips the latter group's not only in planning, monitoring, and evaluating but also in comprehending, memory, and retrieval strategies.

3. The Relationship Between Cognitive and Metacognitive Strategies

Another area of concern in this study is a potential relationship between cognitive and metacognitive strategies for each learner group. A positive correlation between the two overall types of strategies is evidenced by the Pearson's correlation coefficients, as revealed in Table 8.

TABLE 8

The Relationship Between Cognitive and Metacognitive Strategies for Each Learner Group

	General		Vocational	
	Cognitive	Metacognitive	Cognitive	Metacognitive
Cognitive	1		1	
Metacognitive	.782***	1	.818***	1

***$p < .001$

Cognitive strategies were highly correlated with metacognitive strategies for the general high school group ($r = .782$; $p < .001$) and more highly correlated with them for the vocational high school group ($r = .818$; $p < .001$). This implies that an increase or decrease in the use of cognitive reading strategies might influence the extent of the use of metacognitive strategies or vice versa. This lends support to Phakiti's (2006) position that cognitive and metacognitive strategies are closely related.

Correlation coefficients were further computed to test whether the six subtypes of strategies are associated with each other for each learner group. First consider correlation analyses for the general high school group, which are listed in Table 9.

TABLE 9

The Relationship Between Six Strategy Types for the General High School Group

	COM	MEM	RET	PLA	MON	EVA
COM	1					
MEM	.425***	1				
RET	.571***	.575***	1			
PLA	.519***	.588***	.705***	1		
MON	.542***	.558***	.595***	.772***	1	
EVA	.432***	.531***	.591***	.549***	.578***	1

***$p < .001$

As the table illustrates, all the six parings of strategy types employed by the general high school students, whether cognitive or metacognitive, were positively correlated with each

other ($p < .001$). In particular, the correlation coefficient value between planning and monitoring ($r = .772$) was the highest among all the pairs, which was followed by that between retrieval and planning ($r = .705$). This implies that the frequent user of planning strategies tends to employ a high proportion of monitoring strategies, or vice versa. The other correlation coefficient values were below 0.6. In particular, the correlation coefficient value between comprehending and memory ($r = .425$) and that between comprehending and evaluating ($r = .432$) were among the low coefficient values. Nevertheless, it seems clear that all the sets of strategies showed statistically significant correlations in all positive directions. This indicates that the more often the general high school students use one particular strategy type, the more often they employ another type.

It is also worth considering Pearson's correlation coefficients of the six subtypes of strategies employed by the vocational high school students, which are provided in Table 10.

TABLE 10

The Relationship Between Six Strategy Types for the Vocational High School Group

	COM	MEM	RET	PLA	MON	EVA
COM	1					
MEM	.740***	1				
RET	.640***	.696***	1			
PLA	.604***	.646***	.653***	1		
MON	.590***	.638***	.713***	.750***	1	
EVA	.714***	.743***	.730***	.737***	.808***	1

***$p < .001$

Here again, all pairings of the measured strategy types were significantly correlated with each other for the vocational high school group ($p < .001$). The set which marked the highest correlation was that between monitoring and evaluating ($r = .808$), which was followed by that between planning and monitoring ($r = .750$). All the sets of metacognitive strategies produced coefficient values over 0.7, which is indicative of a very strong correlation. Interestingly, a high correlation was evident between the evaluating strategy type and each of the other types, each set producing values over 0.7. As for cognitive strategies, comprehending strategies were highly correlated to memory strategies ($r = .740$). These findings suggest that the vocational high school students who made frequent use of a particular strategy type also tended to choose another type with great frequency. The discussion in this section has shown that there was a positive correlation between all the six subtypes of strategies not only for the general high school students but also for the vocational high school counterparts.

V. PEDAGOGICAL IMPLICATIONS AND CONCLUSION

The analysis thus far has demonstrated that there were similarities and differences between the general and vocational high school groups in their choice of reading strategies. One common feature shared by the two learner groups was that memory strategies were the most popular type of reading strategies with the two groups. This finding is understandable given that Korean students have had many opportunities to store information in their memory such as making notes, underlining main points, and reading repeatedly. This finding clearly indicates that the Korean EFL high school students tended to have a habit of reading by repetition. On the other hand, the least frequent use of planning strategies by the two learner groups indicates that they paid the least attention to a preview and an overview of reading tasks or tests. This suggests that the Korean EFL high school students should be encouraged to capitalize on planning strategies since these strategies help to allocate resources to the current task, determine the order of steps to be taken to complete the task, and set the intensity or the speed at which one should work on the task (Phakiti, 2003a).

With respect to the two overall types, cognitive and metacognitive strategies, both the general high school and vocational high school groups showed a stronger preference for cognitive strategies than for metacognitive strategies. This suggests that the two learner groups failed to strike a good balance between the two types of reading strategies. They had a heavier reliance on the strategies which involve direct interaction with the main reading tasks (Phakiti, 2003a) in the processing of information, with much less awareness of metacognitive strategies. These results may be due to their conception that cognitive strategies are primary with metacognitive awareness secondary in reading comprehension. This is, however, a misconception, weakening the significant role of metacognitive strategies, because many of the previous studies have already appreciated the importance of metacognitive awareness in reading comprehension (Mokhtari & Reichard, 2002; Sheorey & Mokhtari, 2001) and because greater metacognition awareness has been found to lead to more effective and successful reading (Hong-Nam & Page, 2014; Mokhtari & Sheorey, 2002; Sheorey & Mokhtari, 2001). This finding indicates a need to increase readers' metacognitive awareness of reading strategies to gain insights into effective reading instruction (Zhang & Wu, 2009). The metacognitive awareness can be raised if the learners are aware of self-directing and self-regulating their reading processes (Phakiti, 2003a).

A noticeable difference between the general high school and the vocational high school groups was that the former group employed cognitive and metacognitive strategies more frequently than the latter group. This finding might be influenced in part by the difference between the two learner groups in the size or amount of English instructions they received

in the sense that the general high school group was taking four English classes per week, while the vocational high school group, two or three classes per week at the time of the survey. The vocational high school students' less exposure to English language input might lead to less frequent use of reading strategies, either cognitive or metacognitive.

Interestingly enough, the general high school students exhibited a statistically greater inclination to employ all six subtypes of reading strategies (planning, monitoring, evaluating, comprehending, memory, and retrieval) than the vocational high school group. This demonstrates that learners' different language learning environments are an important consideration for the choice of reading strategies. More specifically, the general high school students in general have a higher level of English proficiency than the vocational school counterparts. The former group tends to capitalize on any available reading strategies in their extensive reading to get high scores on the academic tests and thereby enter a good university, whereas the vocational high school students focus attention on building skills specific to an occupation or career field, with less exposure to English language input. Considering Kim's (2000) report that vocational school students had only limited interest in English, motivational factors may also influence their lower inclination to employ all six types of reading strategies. Such being the case, the vocational high school teachers should pay due heed to how to promote their students' reading motivation in the classroom. They also need to help their students activate the use of different types of reading strategies in order to ensure that reading strategies can bridge the gaps the learners cannot fill by linguistic knowledge when they encounter comprehension problems. There is a strong need for reading strategy training for the vocational high school students, which is in line with many researchers' claims (Anderson, 1991; Purpura, 1997).

In this connection, Chamot and O'Malley's (1994) model of learning strategy training can be tailored to suit the purpose of the vocational school classrooms. In the training sessions, the learners need to be provided with explicit instructions on different types of reading strategies: how to comprehend information, how to store information in memory, how to activate background knowledge related to a given topic, how to plan a given task, how to monitor reading process, and how well readers complete reading tasks. This training program, when managed effectively, will help the learners become better prepared to cope with reading problems by developing an extensive repertoire of reading strategies.

On the other hand, correlation analyses revealed a strong positive correlation between cognitive and metacognitive strategies, which implies that the learners who employed cognitive strategies more often tended to deploy metacognitive strategies more often, or vice versa. This finding is in keeping with Purpura's (1997, 1998) finding that metacognitive strategies have a significant, direct, positive relationship to cognitive strategies. A similar tendency seems evident in the relationship between the six subtypes of reading strategies. In other words, comprehending, memory, retrieval, planning,

monitoring, and evaluating strategy types were positively correlated with each other. This indicates that the learners who made more frequent use of a particular strategy type tended to deploy another type more often or that those who utilized a particular strategy type less often was likely to be less frequent users of another type. These findings suggest that teachers need to train their students to stimulate the use of one particular strategy type, which will in turn activate the use of another type. Considering Purpura's (1997) finding that metacognitive strategies exert influence significantly, directly, and positively on applying cognitive strategies, it may be a good move to provide the learners with instructions on metacognitive strategy use. In this way, the knowledge of metacognitive strategies may contribute to a better use of cognitive strategies. As Phakiti (2006) noted, comprehending strategies alone do not affect EFL reading test performance, but the simultaneous orchestration of planning, monitoring, evaluating, memory, retrieval, and comprehending strategies do.

This study has some limitations. It did not consider the learners' English proficiency, which is an important variable influencing strategy use. It merits further investigation to compare high-proficiency and low-proficiency learners in their use of reading strategies, especially in vocational school classrooms. Another research theme which issues a call for more research is how high school students differ from middle school students in their choice of reading strategies. Despite these limitations, findings of the study will help language professionals and teachers recognize the differences in the selection of cognitive and metacognitive reading strategies between the general high school and vocational high school groups and figure out what strategy type should be accentuated in the high schools of different language learning environments. In particular, the vocational school students' use of reading strategies will help to reappraise ESP reading courses and improve their reading skills by incorporating reading strategies into classroom practice in particular areas such as commerce and technology. By doing so, the learners will raise the awareness of cognitive and metacognitive strategies, which will eventually facilitate their reading comprehension.

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APPENDIX

Questionnaire

1. Type of School: _____ 2. Gender: M / F 3. School year: _____ 4. Age : ___
5. How long have been studying English? _____ year(s)
6. Have you ever stayed in English speaking countries? (Yes / No)
   If yes, how long did you stay there? ____ month(s)
7. How many hours per week do you have English classes? ___ hour(s)

Directions: A number of reading strategies which learners use when they are taking a reading test are given below. Read each statement and indicate how often you use each strategy during the test. Choose one of the five options below.

1 (Never) 2 (Sometimes) 3 (Often) 4 (Usually) 5 (Always)

1. I make short notes or underline main ideas during the test.	1 2 3 4 5
2. I translate the reading texts and tasks into Korean.	1 2 3 4 5
3. I use pictures or titles of the texts to help comprehend reading tasks.	1 2 3 4 5
4. I use my own English structure knowledge to comprehend the text.	1 2 3 4 5
5. I spend more time on difficult questions.	1 2 3 4 5
6. I try to understand the texts and questions regardless of my vocabulary knowledge.	1 2 3 4 5
7. I try to find topics and main ideas by scanning and skimming.	1 2 3 4 5
8. I read the texts and questions several times to better understand them.	1 2 3 4 5
9. I use my prior knowledge to help understand the reading test.	1 2 3 4 5
10. I try to identify easy and difficult test tasks.	1 2 3 4 5
11. When I start to complete the test, I plan how to complete it and follow the plan.	1 2 3 4 5
12. I am aware of what and how I am doing in the test.	1 2 3 4 5
13. I check my own performance and progress while completing the test.	1 2 3 4 5
14. I attempt to identify main points of the given reading texts and tasks.	1 2 3 4 5
15. I think through the meaning of the test tasks/questions before answering them.	1 2 3 4 5
16. I am aware of which strategy to use and how and when to use it.	1 2 3 4 5

17. I correct mistakes immediately when found. 1 2 3 4 5
18. I ask myself how the test questions and the given texts relate to what I already know. 1 2 3 4 5
19. I determine what the test tasks/questions require me to do. 1 2 3 4 5
20. I am aware of the need to plan a course of action. 1 2 3 4 5
21. I am aware of how much the test remains to be completed. 1 2 3 4 5
22. I try to understand the questions adequately before attempting to find the answers. 1 2 3 4 5
23. I make sure I understand what have to be done and how to do it. 1 2 3 4 5
24. I am aware of my ongoing reading and test taking. 1 2 3 4 5
25. I keep track of my own progress to complete the questions on time. 1 2 3 4 5
26. I use multiple thinking strategies to help answer the test questions. 1 2 3 4 5
27. I make sure to clarify the goal and know how to complete it. 1 2 3 4 5
28. I check my accuracy as I progress through the test. 1 2 3 4 5
29. I select relevant information to help me understand the reading texts and answer the test questions. 1 2 3 4 5
30. I carefully check the answers before submitting the test. 1 2 3 4 5

Examples in: English
Applicable Language: English
Applicable Level: Secondary

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