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Metacognitive Awareness of Reading Strategies among EFL High School Students in China

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Abstract: The teaching of English in China is increasingly focussing on reading (Bao, 2006) and in recent research, metacognitive aspect of reading strategies has been gaining interest in the field of L2 reading (Zhang & Wu, 2009). This study investigates Chinese EFL high school students' metacognitive awareness of reading strategies and its relationship with students' actual reading performance. 118 Chinese high school students were involved in the study. Data were collected through the *Survey of Reading Strategies* (SORS) and one internal school-based reading exam. One bivariate regression test and one multiple regression test through SPSS were applied to examine the relationship between metacognitive awareness of reading strategies and students' actual reading performance. The results revealed that the metacognitive awareness of reading strategies as measured by SORS was positively associated with students' actual reading performance. Further individual factor analysis showed that Global strategy was a significant predictor of reading performance. This study proved the significant role of metacognitive awareness of reading strategies in EFL high school students' reading performance.

Keywords: Metacognitive awareness, EFL readers, reading strategies, reading performance.

INTRODUCTION

Among the four skills of English language (listening, speaking, reading and writing), reading has received increasing attention in the teaching of English in China (Bao, 2006)

because it is considered an important skill since learners can obtain language input during reading comprehension (Ediger, 2001). However, as we well know, reading is a complicated process which involves various sub-skills such as the ability to rapidly recognize words, to process from words to sentences in order to help reading comprehension, and to utilize strategies and cognitive skills (e.g. planning reading, evaluating results, monitoring reading process and etc.) to facilitate reading (Grabe, 2004). In order to realize reading, learners have to utilize specific reading strategies and cognitive skills to aid reading comprehension; this leads to the important role of reading strategies in the field of second language learning.

METACOGNITIVE AWARENESS OF READING STRATEGIES

Recently, the metacognitive aspect of reading strategies has been developed as a new research endeavour in the field of L2 reading (Zhang & Wu, 2009). To put it simply, metacognitive awareness, also called metacognition, is the way learners think about their own thinking; it is also the ability to consciously control their mental process, in other words, it is a positive control and regulation of one's cognitive process (Vandergrift, Goh, Mareschal, and Tafaghodtari, 2006). Besides, it is a very common phenomenon and happens in one's daily life. Whatever activities one undertakes in a day such as making a plan before doing something, setting a specific goal of achieving a given task, monitoring the activity, and evaluating the completion of a given task, they are considered metacognitive activities (Livingston, 1997).

The important role of metacognitive awareness of reading strategies in helping L2 readers to achieve effective reading has been discussed in recent studies (e.g. Bai, 2014; Hou, 2013; Huang, 2004; Malcolm, 2009; Paris, 2002; Sheorey and Mokhtari, 2001; Zhang & Wu, 2009). According to their findings, reading is not considered a superficial process in which readers just decode the texts word by word to make meaning. Instead, readers combine metacognitive awareness with reading, such as visualizing, questioning, synthesizing, using background knowledge, drawing inference, monitoring, summarizing, responding emotionally and others, to make a positive relationship with reading. It is believed that there is more effective reading during the reading process when readers combine reading of the text with their metacognitive awareness of reading strategies (Zhang & Wu, 2009). However, only a few studies have been carried out to further test with empirical data the relationship between students' metacognitive awareness of reading strategies and their actual reading performance. Thus, the present study aims to examine if Chinese EFL high school students' metacognitive awareness has an impact on their actual reading performance. It also attempts to explore to what extent metacognitive awareness predicts the variance in their reading performance.

METHODOLOGY

This quantitative study was conducted in a high school of Heilongjiang Province, China. The purposive sampling method was adopted and the sample consisted of 118 third-year high school students selected from a population of 700 students. The samples were selected based on their proficiency levels: 38 students were from the low English proficiency level, 44 from the intermediate level and 36 from the high level. The three English proficiency levels were identified according to the classification standard provided by the school where students who scored lower than 72 marks (the total marks were 120) in the English exams were considered at a low proficiency level; students who scored between 72 marks and 96 marks were considered at an intermediate proficiency level and students who scored higher than 96 marks should be in the high proficiency level. The categorization of the students' English proficiency level was based on the students' average scores of three internal English exams taken by the participants before participating in this study.

Research Instruments

Two research instruments were used in this study: a school-based reading performance exam and the "Survey of Reading Strategies (SORS)". The aim of the reading performance exam is to assess participants' reading scores in English. In order to gain permission to conduct the research, and minimize disruption to the existing system of assessment for the school, the existing school-based reading exam was used. The reading exam was developed internally by the English teachers and administered to the whole third-year population of 700 students in the high school. There are mainly two parts to the reading exam. Part one consists of four short passages with 15 multiple-choice questions. Part two is a short passage with five missing blanks to be filled according to the meaning of the context. The total score of the exam is 40 marks. According to the standard provided by the school, 30 marks and above was the reference point which separated successful readers from unsuccessful readers. Each participant's reading score was recorded in the software Statistic Package for Social Science (SPSS) after the exam.

The second instrument in the study is the "Survey of Reading Strategies (SORS)" questionnaire developed by Mokhtari and Sheorey (2002). The aim of SORS is to assess EFL or ESL participants' metacognitive awareness and perceived use of reading strategies when they are reading. SORS is developed from the "Metacognitive Awareness of Reading Inventory (MARSI)", which is first carried out by Mokhtari and Reichard (2002). However, as Mokhtari and Sheorey (2002) pointed out, MARSI is designed to elicit native English speakers' metacognitive awareness towards reading and some of the items in the instrument might not be suitable for second or foreign English learners. Thus, SORS is used in the present study since the participants are EFL high school students from China.

In addition, in order to reduce the language barrier and interference, a Chinese version of SORS adopted from Zhang and Wu (2009) was used to ensure clarity and readability of the SORS items. The revised version of SORS (Zhang & Wu, 2009) displayed in Table 1 has 28 items. The initial version of SORS had 30 items. One ambiguous and repetitive item was deleted (item 14 of MARSI) and two items were combined as one (items 4 and 8 of MARSI). The 28 items are categorized into three broad components of reading strategies: "Global Strategies (GS)" (12 items), "Problem-Solving Strategies (PS)" (7 items) and "Support Strategies (SS)" (9 items). Each item is measured by a "five-point Likert scale" indicating the frequency of strategy use ranging from 1 (*never do or almost never do this*) to 5 (*always do or almost always do this*). A higher number represents more frequent use of the certain strategy. In this revised version of SORS, the internal consistency reliability measured by Cronbach's alpha for "Global Strategies (GS)" is α= .780, "Problem-Solving Strategies (PS)" is α= .790 and "Support Strategies (SS)" is α= .85, which was proven to be acceptable. The levels of metacognitive awareness were identified based on Oxford and Burry-Stock's (1995) categorization of general learning strategy use: a mean of 3.5 or higher represents "High" level, a mean of 2.5 to 3.4 represents a "Moderate" level, and a mean of 2.4 or lower is considered at a "Low" level.

Table 1: The SORS Items (Zhang & Wu, 2009)

Name	Strategy
GS1	Setting purpose for reading
GS2	Checking how text content fits purpose
GS3	Previewing text before reading
GS4	Determining what to read and what to ignore
GS5	Using prior knowledge to help reading
GS6	Using text features (e.g. figures) to facilitate reading
GS7	Using context clues
GS8	Using typographical aids (e.g. boldface)
GS9	Checking understanding when come across new information
GS10	Guessing text meanings
GS11	Checking guessing or predictions
GS12	Analysing and evaluating the information presented in the text
PS1	Reading slowly and carefully
PS2	Adjusting reading speed
PS3	Pausing and thinking about reading
PS4	Picturing or visualizing information read
PS5	Re-reading for better understanding
PS6	Guessing meaning of unknown words
PS7	Trying to concentrate on reading
SS1	Taking notes while reading
SS2	Underlining information in text
SS3	Reading aloud when text becomes hard

SS4	Using reference materials
SS5	Paraphrasing for better understanding
SS6	Going back and forth in text
SS7	Asking oneself questions
SS8	Translating from English to native language while reading
SS9	Thinking in both English and native language while reading

Legend: GS - Global Skills, PS - Problem Solving Skills, SS - Support Skills

Data Collection Procedures

Firstly, the reading performance exam was administered to the whole population of the third-year high school students including the 118 participants involved in this study. The exam took 40 minutes. The students had enough time to review their answers before submission. After the English reading exam, the 118 participants were gathered immediately in one classroom to answer the SORS questionnaire administered by the researcher. Before answering the questionnaire, the researcher informed the participants of the objectives of SORS and the study. All the participants were asked to provide honest answers and they were free to ask questions or stop participating in the research at any time during the session. The researcher was in charge of answering questions that students posed during this session. It took about 10 minutes for all the participants to finish the questionnaires. After the session, small tokens were distributed to all the respondents after their participation. All the 118 questionnaires were examined and deemed valid for data analysis.

Data Analysis

All the data were coded and double-checked using SPSS Statistics version 22.0. Firstly, a bivariate regression analysis was conducted to test the relationship between the students' metacognitive awareness of reading as measured by SORS and reading performance as measured by the reading exam, and to investigate the extent to which metacognitive awareness of reading strategies predicted students' actual reading performance. Secondly, a multiple regression test was conducted subsequently to explore the relationship between the individual factors i.e. the three aspects of metacognitive awareness of reading strategies, and students' reading performance. The correlations between individual factor and reading performance were calculated and compared. Furthermore, the differences between successful readers and unsuccessful readers were investigated in terms of the levels of the three aspects of metacognitive awareness of reading strategies.

RESULTS AND DISCUSSION

The Relationship between Metacognitive Awareness of Reading Strategies and Reading Performance

In order to investigate the relationship between students' metacognitive awareness of reading strategies and their actual reading performance, the students' general levels of metacognitive awareness as measured by SORS items and their scores for their reading performance are calculated first. The descriptive statistics of students' reading performance scores and metacognitive awareness levels are presented in Table 2 and Table 3 respectively. Students' mean reading performance shows 28.10 (Table 2). This indicates that the students are at an intermediate level of reading proficiency for English. The standard deviation is 6.39 indicating relative variability in student's reading scores. The mean score of students' metacognitive awareness of reading strategies is 3.14 on a five-point scale (Table 3), revealing a moderate level. The standard deviation is 0.62, indicating relatively less variation in overall metacognitive awareness level among the students.

Table 2: Descriptive Statistics of Students' Reading Performance Scores (N=118)

	Minimum	**Maximum**	**Mean**		**Std. Deviation**
Reading	Statistic	Statistic	Statistic	Std. Error	Statistic
Scores	4.00	36.00	28.10	.59	6.39

Table 3: Students' Metacognitive Awareness of Reading Strategies as Measured by SORS

	Minimum	**Maximum**	**Mean**		**Std. Deviation**
	Statistic	Statistic	Statistic	Std. Error	Statistic
GS	1.75	4.83	3.23	.06	.63
PS	1.71	4.86	3.44	.06	.65
SS	1.44	4.22	2.76	.05	.59
Overall	1.18	4.29	3.14	.05	.62

A bivariate regression test was conducted to examine the relationship between students' metacognitive awareness of reading strategies and their actual reading performance. The aim of the bivariate regression test was to see if the independent variable was predictive of a certain outcome of the dependent variable. Thus, in the present study, students' overall means of SORS were set up as the independent or predicted variable, while the students' reading performance scores were set up as the dependent or outcome variable. The results are presented in Table 4.

Table 4: Results of the Bivariate Regression Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.48[a]	.23	.225	5.63

a. Predictors: (Constant), Average

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1106.46	1	1106.46	34.91	.000
	Residual	3676.32	116	31.69		
	Total	4782.78	117			

Note: *. Correlation is significant at the 0.05 level

a. Dependent Variable: reading scores

b. Predictors: (Constant), Average

The results show that the students' overall metacognitive awareness of reading strategies as measured by SORS significantly predicted the students' English reading performance, F (1, 117) = 34.91, $p< 0.05$. To be more precise, the higher the students marked on the SORS scale, the higher they scored on their English reading exam. Besides, the metacognitive awareness of reading strategies as measured by SORS accounted for 23% of the variance in English reading performance which was estimated by the reading exam (R=0.48, R^2=0.23). As proposed by Cohen (1988) and suggested in Goh and Hu (2014), the medium effect size is R=0.30 and the big effect size is R=0.50. In this case, the effect size of the above analysis is R=0.48, approaching the value for a big effect. Therefore, the students' perception of their own levels of metacognitive awareness of reading strategies as measured by SORS was able to have a huge significant effect in predicting their English reading performance. These results are consistent with Huang's (2004) and more recently, Shang and Zhang's (2015) studies in which Chinese university students' reading performance has been proven to have a positive relationship with the explicit instruction on metacognitive awareness of reading strategies.

The Relationship between Three Aspects of Metacognitive Awareness of Reading Strategies and Students' Reading Performance

To explore further, a multiple regression test was conducted to investigate the relationship between the three aspects of metacognitive awareness of reading strategies measured by SORS and the students' reading performance measured by the internal reading examination. The aim of the multiple regression test was to predict the values on an unknown outcome variable by using several other variables, also called the predictors. In the present analysis, students' scores of reading performance were set as outcome variables or dependent variables, and scores of metacognitive awareness of the three SORS categories, Global, Problem-solving and Support strategies, were set as predicted variables or independent variables. The results shown in Table 5 included R, R^2, adjusted R^2, standard error of the estimate, and the unstandardized regression coefficients (B).

Table 5: Results of the Multiple Regression Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.484[a]	.234	.214	5.66908

a. Predictors: (Constant), support strategies, problem-solving strategies, global strategies

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.517	3.246		2.932	.004
	GS	3.166	.996	.315	3.177	.002
	PS	1.117	1.043	.115	1.071	.286
	SS	1.640	1.081	.151	1.517	.132

Note: *. Correlation is significant at the 0.05 level

a. Dependent Variable: scores of reading exam

The results of the relationship between individual factors and reading performance scores reveal that among the three categories of metacognitive awareness of reading strategies, Global strategy is a significant predictor (p=0.002) of the scores of reading performance compared with the other two categories. The unstandardized coefficient of Global strategy (B=3.166) predicts that for one score increase in the metacognitive awareness of Global strategy, students' scores of reading exam will increase by 3.12 scores holding Problem-solving and Support strategies as fixed. In contrast, Problem-solving and Support strategies fail to show a significant relationship with students' scores of reading exam with a p value of 0.29 and 0.23 respectively. Compared with Problem-solving strategy, the unstandardized coefficient value of Support strategy is B=1.64, which is slightly bigger than the unstandardized coefficient value of Problem-solving strategy (B=1.12), indicating that Support strategy has a slightly better predictive ability for students' reading performance than Problem-solving strategy.

It can then be concluded that among the three categories of SORS, the Global strategy is considered the most important predictor of students' actual reading performance, and this is followed by Support strategy and Problem-solving strategy consecutively. Further inference can be made that students who performed better or scored higher in the English reading examination in this study show a higher metacognitive awareness of using Global strategies compared with other students. They were more aware of applying different abstract strategies such as setting purpose, planning, using context clues and evaluating while reading English text.

In order to explore further the differences in the levels of the three aspects of metacognitive awareness of reading strategies for successful and unsuccessful readers,

the researcher divided the 118 participants into two groups based on their reading scores. Students who scored higher than 30 marks were considered as successful readers while those who scored lower than 30 marks were grouped as unsuccessful readers.

Table 6: Successful and Unsuccessful Readers' Metacognitive Awareness of Reading Strategies

Name	Strategy	Successful readers (*n*=70)		Unsuccessful readers (*n*=48)	
		M	S.D.	*M*	S.D.
GS1	Setting purpose for reading	3.3	1.4	2.7	1.1
GS2	Checking how text content fits purpose	2.9	1.2	2.3	1.0
GS3	Previewing text before reading	3.3	1.3	2.9	1.2
GS4	Determining what to read and what to ignore	3.2	1.2	2.6	.98
GS5	Using prior knowledge to help reading	4.1	.95	3.4	1.0
GS6	Using text features (e.g. figures) to facilitate reading	3.8	1.2	3.4	1.2
GS7	Using context clues	4.1	.85	3.3	1.1
GS8	Using typographical aids (e.g. bold face)	3.6	1.3	3.3	1.2
GS9	Checking understanding when come across new information	3.2	1.1	2.9	1.2
GS10	Guessing text meanings	3.9	1.0	3.4	1.2
GS11	Checking guessing or predictions	3.4	1.1	2.8	1.2
GS12	Analysing and evaluating the information presented in the text	2.5	1.1	2.2	1.1
PS1	Reading slowly and carefully	3.5	1.0	3.2	1.2
PS2	Adjusting reading speed	3.7	.92	3.4	1.0
PS3	Pausing and thinking about reading	3.3	1.1	3.3	1.2
PS4	Picturing or visualizing information read	3.1	1.2	2.9	1.2
PS5	Re-reading for better understanding	3.7	1.1	3.1	1.3
PS6	Guessing meaning of unknown words	3.8	.87	3.5	.95
PS7	Trying to concentrate on reading	3.9	.92	3.4	1.1
SS1	Taking notes while reading	2.8	1.3	2.5	1.2
SS2	Underlining information in text	3.4	1.2	3.0	1.1
SS3	Reading aloud when text becomes hard	2.5	1.3	2.1	1.2
SS4	Using reference materials	2.7	1.1	2.8	1.0
SS5	Paraphrasing for better understanding	2.9	1.2	2.4	1.0
SS6	Going back and forth in text	3.6	1.0	3.2	1.2
SS7	Asking oneself questions	1.9	1.0	1.9	.95
SS8	Translating from English to native language while reading	2.6	1.2	2.4	1.0
SS9	Thinking in both English and native language while reading	3.5	1.1	3.1	1.1
GS	**Global Strategies**	**3.4**	**1.1**	**2.9**	**1.1**
PS	**Problem-solving Strategies**	**3.6**	**1.0**	**3.3**	**1.1**
SS	**Support Strategies**	**2.9**	**1.1**	**2.6**	**1.1**
ORS	**Overall Reading Strategies**	**3.3**	**1.1**	**2.9**	**1.1**

As shown in Table 6, successful readers reported higher metacognitive awareness levels on Global strategies (*M*=3.4) compared with the unsuccessful readers (*M*=2.9). They reported the highest metacognitive awareness level in GS5 "using prior knowledge to help reading", which was also consistent with Zhang (2002)'s finding that students who considered "relating text to what is already known of the subject/topic" tended to be successful readers. Students who like to "anticipate content" (GS11), "guess… text meanings" (GS10), and "question the author" (GS12) were considered successful readers for English. As the successful readers possessed higher metacognitive awareness of Global reading strategies, they tended to deal with the reading materials in a positive way. They were confident in setting goals when reading and in evaluating whether the reading content matched their purpose. They tended to determine what to read or not to read based on their own perceptions. When reading, they utilized the content clues in the reading materials to help them with their understanding. In their minds, the reading contents were not something to be avoided instead were useful information that can be absorbed. Moreover, they considered themselves as readers and not students being assessed by the reading examination. Therefore, successful readers in this study were better at critically interacting with the reading passage and were not daunted by the authority of the texts given in the reading examination.

The application of the second group of strategies, Problem-solving strategies, is noteworthy, although it failed to act as a significant predictor of reading performance in the multiple regression test. It is pertinent to note in Table 6 that successful readers' average mean of Problem-solving strategy (*M*=3.6) is higher than unsuccessful readers' average mean (*M*=3.3), indicating that successful readers are better at applying Problem-solving skills to cope with reading difficulties. The third group of strategies, Support strategies, also failed to show a significant relationship with the students' actual reading performance in the multiple regression test. Both the successful readers (*M*=2.9) and unsuccessful readers (*M*=2.6) reported lower metacognitive awareness level of Support strategies. Although not a significant predictor, the Support strategy which is highly utilised by both successful and unsuccessful readers is the strategy of "going back and forth in text" (SS6 in Table 6). Both the groups of readers seemed to take this support mechanism as an important aid to facilitate reading more effectively and to gain a more accurate understanding of the reading contents.

CONCLUSION AND IMPLICATIONS

This study examines the relationship between Chinese EFL high school students' self-perceived metacognitive awareness of reading strategies and their actual reading performance scores. Data collected through the Survey of Reading Strategies (SORS) and one internal reading examination show that the metacognitive awareness of reading strategies as measured by SORS is positively related to students' actual reading performance, accounting for 23% of the variance in English reading performance.

Analysis of individual factors shows that Global strategy is a significant predictor of reading performance, while Problem-solving and Support strategies fail to demonstrate a significant relationship with reading performance. Besides, successful readers reported higher levels of metacognitive awareness of Global reading strategies compared with the unsuccessful readers, which also verify the results of the multiple regression test.

Methodically, this study proves that L2 readers' metacognitive awareness can be investigated through a valid questionnaire. The SORS questionnaire is a useful and reliable tool to assess EFL students' metacognitive awareness of reading strategies. As pointed out by Matsumoto (1993), a questionnaire can be used as a sound method to facilitate learners introspection of their own learning process.

Since it is indeed necessary and desirable to incorporate metacognitive awareness instruction in the teaching of reading in the EFL classrooms, the traditional reading comprehension-testing model taught in China needs to be updated. SORS can be applied in the language classroom as an efficient instrument to interpret students' real reading needs. This comprehensive questionnaire which provides details of each aspect of metacognitive awareness can be used as an instrument to guide and elicit students' metacognitive awareness of reading strategies gradually. Students can begin to develop their knowledge of such reading strategies when they get to read and understand what these strategies are and learn in class how to adopt them as they gain milestones in their reading skills in English. More specifically, as the results show that Global strategy is the most significant predictor of students' reading performance, teachers can emphasize this group of strategies more than others (all 12 items of Global strategies). In class, an activity that can trigger application of Global strategies is to set a time limit for reading. This, in turn, will force students to read quickly which activates the reading globally, guessing and making predictions strategies rather than the habitual strategy of reading line by line for specific content. Moreover, teachers can trigger background knowledge of the reading texts in class prior to the reading activity. In this way, self-regulation of reading performance can be developed as a habit.

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