METACOGNITIVE AWARENESS OF READING STRATEGIES AMONG EFL HIGH SCHOOL STUDENTS IN CHINA

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ABSTRACT

Readers' metacognitive awareness of reading strategies has always been the interest of L2 reading research (Zhang, 2001). This study reported an investigation of 118 Chinese EFL students' metacognitive awareness of reading strategies and the relationship between metacognitive awareness and actual reading performance. Data was collected through the Survey of Reading Strategies (SORS) and one internal reading exam. The findings showed that students' overall metacognitive awareness of reading strategies was at a moderate level with the highest level on problem-solving strategies, followed by global strategies and support strategies. Students from high English proficiency group reported considerably higher metacognitive awareness in global and problem-solving strategies compared with the students from intermediate and low proficiency groups, which provided the evidence that readers' metacognitive awareness of reading strategies was related to their English language proficiency. Further investigation revealed that the metacognitive awareness of reading strategies as measured by SORS was positively associated with students' actual reading performance, accounting for 23% of the variance in English reading performance. Analysis of individual factors showed that global strategy was a significant predictor of reading performance. The findings of this study also showed a possible way for English reading instructors to assess readers' metacognitive awareness of reading strategies, so that they can better interpret readers' learning needs and design suitable strategy-based reading curriculum.

Keywords: metacognitive awareness, L2 reading, reading strategies, EFL readers

ABSTRAK

Kesedaran metakognitif pembaca terhadap strategi membaca sentiasa menjadi fokus penyelidikan tentang pembacaan dalam bahasa kedua (Zhang, 2001). Kertas penyelidikan ini melaporkan siasatan tentang kesedaran metakognitif 118 pelajar Cina yang belajar Bahasa Inggeris sebagai bahasa asing terhadap strategi membaca dan hubungan antara kesedaran metakognisi dan prestasi pembacaan yang sebenar. Data dikumpulkan melalui Penyiasatan Strategi Membaca (SORS) dan satu peperiksaan membaca dalaman. Dapatan kajian menunjukkan bahawa kesedaran metakognitif keseluruhan pelajar terhadap strategi membaca adalah pada tahap sederhana dengan tahap tertinggi jatuh kepada strategi penyelesaian masalah, diikuti dengan strategi global dan strategi sokongan. Pelajar dari kumpulan penguasaan bahasa Inggeris yang tinggi dilaporkan mempunyai kesedaran metakognitif yang lebih tinggi dalam strategi global dan penyelesaian masalah berbanding dengan pelajar-pelajar dari kumpulan penguasaan pertengahan dan rendah. Dapatan kajian ini membuktikan bahawa kesedaran metakognitif pembaca terhadap strategi membaca adalah berkaitan dengan penguasaan bahasa Inggeris mereka. Siasatan yang lanjut mendapati bahawa kesedaran metakognitif terhadap strategi membaca seperti yang diukur dengan SORS mempunyai korelasi yang positif dengan prestasi membaca sebenar pelajar, dengan 23% varians dalam prestasi membaca Bahasa Inggeris. Analisis faktor-faktor individu menunjukkan bahawa strategi global adalah peramal yang signifikan bagi prestasi membaca. Dapatan kajian ini juga menunjukkan cara-cara yang boleh diguna oleh pengajar pembacaan Bahasa Inggeris untuk menilai kesedaran metakognitif pembaca terhadap strategi membaca. Selain itu, dapatan juga membantu

pengajar dalam pentafsiran keperluan pembelajaran pembaca dan membantu mereka dalam membentuk kurikulum pembacaan yang berasaskan strategi yang sesuai.

Kata kunci: kesedaran metakognitif, pembacaan untuk pelajar bahasa kedua, strategi membaca, pembaca yang belajar bahasa Inggeris sebagai bahasa asing

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INTRODUCTION

1.1 Background

In this section, the important role of English language learning, the current situation of the learning of English reading and the current issues relating to the teaching of English reading in China are presented. Besides, the description of Qiqihar High School, Heilongjiang, China, where the research is conducted, is provided to give a brief idea of the school's English learning environment and the role of English language played in students' daily life.

1.1.1 The Learning of English Reading in China

English is becoming increasingly important in the education system of China (Bao, 2004). It is suggested by the Chinese Ministry of Education (MOE) that Chinese public schools should begin to teach English at least in Grade 3 in order to improve Chinese people's English proficiency level to participate in the international competition. For the Chinese high school students, English language is more important since the English exam plays a vital role in China's college entrance examination (Jeng, 2001). The teaching of English language has always been the focus in the high school classrooms of China and

both teachers and students make great efforts to improve it (Hu & Baumann, 2014).

Among the four skills (listening, speaking, reading and writing) of English, reading has received more and more attention in the English teaching of China (Bao, 2006). Reading is considered an important skill since learners can obtain language input during reading comprehension (Ediger, 2001). Besides, reading is a complicated process which involves various aspects like rapidly recognizing words, processing from words to sentences in order to help reading comprehension, and utilizing strategies and cognitive skills (e.g., planning reading, evaluating results, monitoring reading process and etc.) to facilitate reading (Grabe, 2004). All of these aspects require second language (L2) learners to rapidly and efficiently apply their knowledge to cope with the reading process which involves many exercises in the classroom.

Regarding the learning context of China, English serves as a foreign language (EFL). Chinese EFL learners are situated in an "input-poor context" (Zhang, 2001: 268), which means that Chinese students only learn English in the classroom and seldom use it outside the classroom. Among the four skills of English, English language reading is considered the most crucial part of English teaching and learning (Bao, 2004, 2006) and is taught in all high schools' classrooms in China (Bao, 2006). However, as observed by Zhang and Wu (2009), most of the teaching of English reading in the high schools of China still focus on the traditional comprehension-testing model, in which students are asked to do numerous reading tests with only a slight emphasis on reading strategies instruction. Besides, students always complain that this comprehension-testing model in that their

English reading proficiency has not been improved and they are not familiar with how to apply strategies during reading (Zhang & Wu, 2009). Meanwhile, teachers also report that students do not apply the strategies which are taught in the classroom to facilitate reading (Zhang & Wu, 2009).

According to Shang and Zhang (2015), the teaching of English reading is facing great difficulties and problems in the English classroom of Chinese high school: These challenges include the outdated teaching method (teacher-centered method), the lack of cultivating students' reading interest, limited reading materials, too much reliance on the teaching references, too much focus on teaching grammar instead of explaining the cultural background knowledge and text structure. The teaching method of English reading requires improvement in order to attract students' interests.

For Chinese EFL high school learners, most of them are facing the reading difficulties such as the lack of vocabulary, the poor English reading habits (rereading, finger reading and reading aloud), the lack of reading strategies and reading interest, and the cultural background differences (Jin & Cortazzi, 2002). Because of the "input-poor" learning environment, Chinese EFL students need to make great efforts to improve their English reading skills to meet the requirement of fluent and accurate reading expected in the English exams. However, it is not an easy task to solve all the difficulties and problems. Both the teachers and the students must discover their own teaching and learning strategies through classroom practices. More studies, especially empirical research is called for to investigate Chinese' high school students' English reading learning situation

and special learning needs.

1.1.2 Description of Qiqihar High School, Heilongjiang, China

Qiqihaer High school is located in Qiqihaer, Heilongjiang province, in the northeast part of China (see Figure 1.1). Qiqihaer High School was established in 1949 and was one of the first-rated key high schools in Heilongjaing province. The school has over 216 faculty members and over 2,560 students (http://www.qqhrzx.net/Item/list.asp?id=1234). Most of the students in Qiqihaer High School come from Qiqihaer city and other counties in Heilongjiang province. They use Dong Bei dialect, which is similar to Chinese Mandarin, to communicate with people in the school and in their daily life. The medium of instruction is Chinese Mandarin in Qiqihaer High School, while English serves as a foreign language; the student only learn and use English in the English language classroom.

During the recent years, in order to provide good English language learning environment, Qiqihaer High School is committed to establish cooperation with outstanding schools and institutions at home and abroad. In 2004, the school cooperated with Beijing Normal University (BNU) and became the foreign language experimental school of BNU. In 2007, the school established the "Friendly Education Class" together with the Ministry of Education of New Zealand in order to provide more English classes and better English learning environment for the students.

Figure 1.1: The map of China

1.2 Statement of the Problem

In the field of L1 and L2 reading research, English reading strategies utilized by learners as a tool to enhance reading comprehension has been widely investigated; a number of reading strategies have been identified in both L1 (Cohen, 1996; Oxford, 1996) and FL (e.g., Arabic, China and Iran) contexts. Recently, metacognitive aspect of reading strategies has been developed as a new research endeavor in the field of L2 reading (Zhang & Wu, 2009), since studies have found its important role in helping L2 readers achieve effective reading (Carrell, Gajdusek, & Wise, 1998; Kraayenoord, 2010; Ouellette, 2006).

As stated in Auerbach and Paxton (1997: 241), the definition of metacognitive awareness of reading refers to learners' "knowledge of strategies for processing texts, the

ability to monitor comprehension, and the ability to adjust strategies as needed". As Macaro (2001) and Zhang and Wu (2009) point out, if teachers know what kind of reading strategies students tend to apply, how they apply different strategies to reading comprehension and what students think about during reading, teachers can better understand students' problems with reading strategies thereby fully understand students' reading learning needs, and design suitable strategy-based reading instructions.

Therefore, the first gap this study intends to fill is to examine the metacognitive awareness of reading strategies of high school students in the EFL context of China in order to better understand students' own perceptional use of reading strategies. Additionally, recent work of Hou (2013) which examines the EFL context of Taiwan has found that the three aspects (global, problem-solving and support strategies) of metacognitive awareness of reading strategies are positively related to students' actual reading performance. Nevertheless, this finding needs to be further investigated with different data set from other EFL learning contexts in order to verify the results and identify significance and generalizability (Mackey & Gass, 2005). Thus, the second gap that the study intends to fill is to explore the relationship between the various sub-components of metacognitive awareness and English reading performance with Chinese high school EFL students as the target participants.

1.3 Research Objectives

There are mainly two objectives of the present study; the first purpose is to investigate the level of metacognitive awareness of English reading strategies among Chinese EFL high school students in general and within different English proficiency groups. The second aim is to further investigate the relationship between metacognitive awareness of reading strategies and reading performance to explore to what extent metacognitive awareness predicts the variance in reading performance.

1.4 Research Questions

Based on the two objectives stated above, there are four research questions to be solved in this present study:

1. What are the levels of metacognitive awareness of reading strategies of Chinese EFL high school students?

2. What are the differences among low-, intermediate-, and high-proficiency students' levels of metacognitive awareness of reading strategies?

3. What is the relationship between students' metacognitive awareness of reading strategies and their actual reading performance?

4. How do the three aspects (global, problem-solving and support strategies) of the students' metacognitive awareness of reading strategies relate to their reading performance?

1.5 Significance of the Study

Firstly, this study is significant for Chinese English teachers to assess Chinese EFL high school students' levels of metacognitive awareness of reading strategies and their own perceptional use of reading strategies during actual reading.

Secondly, the investigation on the relationship between metacognitive awareness of reading strategies and actual reading performance expands the existing scope of research on metacognitive awareness and L2 reading applied in an EFL context. It shows the important role of metacognitive awareness played on students' reading performance.

Thirdly, the instrument, especially the SORS questionnaire used in this study is an efficient method for English reading teachers to assess readers' metacognitive awareness of reading strategies, and it can also be guidance for future empirical studies in investigating L2 learners' metacognitive awareness of reading strategies and its relationship with reading performance.

1.6 Limitations of the Study

Inevitably, there are several limitations of the present study. First of all, the subjects of this study are limited to Chinese high school students from one high school in China. The results might not be generalized to the entire high school context in China or other

foreign contexts.

Secondly, since the study mainly focuses on metacognitive awareness and English reading comprehension, other variables such as motivation, sex, psychological types, stored vocabulary knowledge, cognitive styles, learning preferences, and intelligence which might influence the actual reading performance are not examined. In this aspect, more studies are called for to widen the scope of the research by incorporating the above factors with metacognitive awareness of reading strategies.

Thirdly, since the main instrument of the study was the SORS questionnaire, the individual differences might not be accurately captured. Besides, due to time constraint, the classroom observation of actual reading activities was not conducted and teachers' feedback on the research findings were not collected. Moreover, since the participants answered the questionnaire mainly through self-reporting, there was a possibility that they failed to report what they did in the actual reading performance.

1.7 Summary

In this chapter, the current situation and difficulties of the learning and teaching of English reading in Chinese EFL high school are introduced. A brief introduction of Qiqihaer High School is provided to give a picture of the English learning environment of the students who participate in this study.

The statement of the research problem is illustrated and two research objectives and four research questions are raised accordingly. The significance and limitations of the study are stated briefly. The following chapters are illustrated and expanded based on these two research objectives and four research questions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Metacognition or metacognitive awareness plays a vital role in readers' processing of L2 reading. In favor of understanding the relation between L2 reading and metacognitive awareness, related literature on the process of reading and metacognition are presented in this chapter.

2.1.1 The Psycholinguistic Model of Reading

The understanding of reading has undergone great changes during the last decades. As Clarke and Silberstein (1977) and Silberstein (1987) pointed out, in the early stage of reading research, reading was simply seen as a strengthening for speaking a language, and the reading process was considered in a rigid fashion that readers simply interpreted the reading materials word-by-word.

However, people's perspective of reading was changed by the early studies and observations of the scholars (e.g. Goodman, 1970; Grabe, 1991; Miller, 1967; Smith, 1971). Under their efforts, a psycholinguistic model of reading has been established. Primarily, Miller (1967) noticed a restriction that is, readers have limited ability in receiving, processing and interpreting large amount of information in a rapid speed. One possible reason underlying the reading process was that readers did not utilize all the

information in the material but selected the most useful contextual cues in order to understand texts. Goodman (1970) concurred with Miller's conclusion and perceived reading as "a psycholinguistic guessing game" and a selective and active process that good readers read by applying various actions to maintain effective reading. Goodman (1970: 260) explained the psycholinguistic model of reading as follows:

> "Reading is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed, tentative decisions are made to be confirmed, rejected or refined as reading progresses."

He considered readers' construction of meaning from the texts as a cyclical process, that readers started by sampling information from the texts, making prediction, testing or adjusting prediction, and sampling further. Goodman's views were widely accepted by other researchers and accepted in the field of language study (Carrell & Eisterhold, 1983). Smith (1971: 68) agreed with Goodman's arguments and further extended the definition of reading process as that "reading was an imprecise and hypothesis-driven process", a natural activity that people tried to make sense of print and tried to discover their relationship with it.

Later on, through synthesizing the previous literature, Grabe (1991: 378) came up with a description of reading as a "rapid, purposeful, interactive, comprehending, flexible, and gradually developing process". Reading is rapid because readers need to synthesize all the useful information, make predictions and inferences, maintain the flow of reading in a high speed and a limited time. Reading is purposeful because readers read for

different purposes whether it is for information, academic tasks, entertainment or research. Reading is interactive since readers make a connection between what they already know in their prior knowledge and the reading texts. Besides, the application of various skills or strategies by readers to facilitate reading comprehension can also be seen as readers' interaction with the reading texts. Reading is comprehending because every reader, especially for ESL/EFL readers, make efforts to understand what they are reading. Reading is flexible because readers tend to utilize various kinds of strategies such as skimming, underlining or circling important information, adjusting reading speed accordingly and so on during reading. Lastly, reading is developed gradually; the process from reading slowly to reading fluently is not built in a day, a lot of trainings are required to become successful readers.

Based on the establishment of the psycholinguistic model of reading, investigations on L2 reading has been fostered during the last decades (Grabe, 1991). Initially, the study of L2 reading was shaped by first language (English) reading research since the stable and large first language populations and the developed research on cognitive psychology and education contributed to the prosperity of first language reading research (Grabe, 1991; Mokhtari & Reichard, 2002). Some researchers (Weber, 1991; Bernhardt, 2000) even considered that research on L2 reading studies simply served as an extension of the research scope of first language reading. However, during the last 30 years, as the number of international students enrolling in the United States and British tertiary institutions increased, ESL teachers began to emphasis the importance of reading skills so that international students can be better prepared for various academic tasks; since then the

research of reading in L2 has been fostered (Grabe, 1991).

According to Bernhardt (1991) and Sheorey and Mokhtari (2001), most of the investigations on L2 reading imported the theoretical framework from the existing scope of first language research (e.g. Goodman, 1970, 1985; Smith, 1979). In the late 1970s to the present, the psycholinguistic model of reading process has been translated to the ESL contexts (Grabe, 1991). Clarke and Silberstein (1977) proposed a psycholinguistic model, originated from Goodman and Smith, of L2 reading. According to their proposal, similar to reading in the first language, L2 reading was considered an effective reading process, in which readers utilize the most productive contextual cues to process information, apply their prior knowledge (linguistic knowledge and knowledge of the real world) to facilitate reading, make tentative decisions, reject or confirm decisions, and require instructions on reading strategy to read effectively.

Clarke and Silberstein (1977) also emphasized the role of teacher on reading instruction to ESL students; teachers were not only responsible for solving a language problem but also responsible to help the students to clarify reading goals, to organize activities before reading in order to provide the "conceptual readiness" of the students, and to introduce different strategies for students to deal with syntax and vocabulary difficulties. All of these implications remained a vital reference for today's learning and teaching of L2 reading.

Coady (1979) further elaborated Goodman's psycholinguistic model and developed Clarke and Silberstein (1977)'s proposal into a more specific model that fit into L2 readers. According to Coady (1979), there are three elements of the reading process; namely, "process strategies, background knowledge, and conceptual abilities" (see Figure 2.1: 16). All of the three components interact with each other to produce comprehension. Process strategies refer to the basic components of reading abilities such as grapheme-phoneme, grapheme-morphophoneme, syllable-morphem, syntax, lexical meaning, and contextual meaning. Conceptual abilities refer to the general intellectual capacity to understand the text. Background knowledge refers to readers' cultural background or prior knowledge, which enable them to overcome the syntactic difficulties raised in the texts and to read more effectively.

According to this model, a novice L2 reader tended to concentrate more on "process strategies", referring to the rigid recognition of the words in the text. When the reading proficiency of L2 readers improve, they develop the ability to interpret more abstract concept and phrases, and they prefer to utilize contextual clues and the background knowledge to help them make or reject predictions. Among the three components of the reading process, Coady (1979) emphasized more on the role of background knowledge, based on the evidence that readers with a western cultural background can learn English reading faster than readers with non-western cultural background.

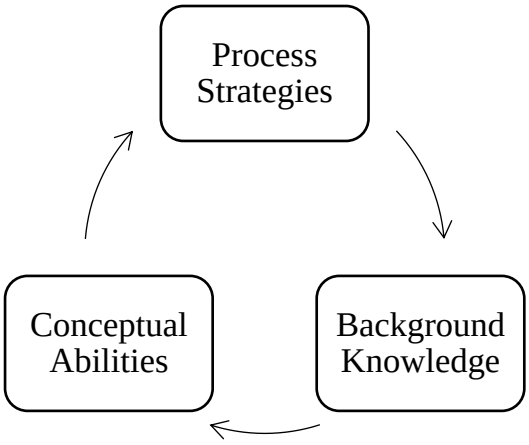

Figure 2.1: A psycholinguistic model of the EFL/ESL reader

Source: Adopted from Coady (1979:7)

However, as observed by Carrel and Eisterhold (1983), sufficient emphasis was not given to the background knowledge despite the important role it played in the reading process. As stated in Clarke and Silberstein (1977: 137), the background knowledge which readers took into the reading process was the most powerful one:

> "The reader brings to the task a formidable amount of information and ideas, attitudes and beliefs. This knowledge, coupled with the ability to make linguistic predictions, determines the expectations the reader will develop as he reads. Skill in reading depends on the efficient interaction between linguistic knowledge and knowledge of the world."

Later on, Field (1984) adopted Coady's psycholinguistic model and applied it into the Chinese context. Based on her study, she concluded that Chinese EFL students failed to switch to more abstract strategies in the progression of becoming a fluent reader. She further concluded that Chinese students seemed to be tied to using process strategies and revealed difficulties in using abstract strategies to obtain high-level of reading proficiency. This is because of the "social factors" and the adjustment owing to "switching from reading an ideographic language to reading an alphabetic one". Through her later

discussion with the Chinese ESL teachers, she noticed that Chinese EFL teachers considered techniques like reading aloud and reciting the texts as the best way to learn reading, and they also argued that the reading strategies they used in their native language cannot be transferred to English reading because the limited vocabulary stopped them from reading rapidly. At the end, she suggested that in order to help Chinese ESL students become fluent and successful readers, teachers should make the process strategies explicit and concrete. To put it differently, teachers should help the students to notice the process strategies when reading in L1 and then help them to transfer the process strategies to read in L2 (English). When they are familiar with using the process strategies, they would be ready to step into the next level (the use of abstract strategies) to become fluent readers.

2.1.2 The Schema Theory Model of Reading

As stated in the above literature review, L2 reading researchers such as Clarke and Silberstein (1977), Carrel and Eisterhold (1983), Coady (1979) and Field (1984) have recognized the important role of background knowledge. They characterized this theory as *schema theory* (Carrell & Eisterhold, 1983). The basic idea of schema theory is that "any text does not include any meaning by itself", and "a text only provides directions for readers to construct meaning through their own acquired knowledge" (Carrell *&* Eisterhold, 1983: 554). As reported by Rumelhart (1980), the acquired knowledge which readers learned previously was called the readers' *background knowledge*, and the structures of the learned knowledge were called *schemata*.

In the traditional way of teaching EFL/ESL reading, the focuses are on the reading materials, not on the readers, and readers are considered independent from the texts. Additionally, it is the readers' lack of lexical and grammatical knowledge that makes them fail to comprehend the texts. However, the schema theory challenges the traditional viewpoint of EFL/ESL reading and proposes that the process of reading comprehension is "an interactive process" which takes place between the "readers' background knowledge and the text" (Carrell & Eisterhold, 1983: 556). Thus, efficient reading comprehension takes place when readers are able to relate what they read from the text to their own prior knowledge.

According to the schema theory illustrated in Carrell and Eisterhold (1983: 557), the processing of information can be categorized into two modes, namely "bottom-up" and "top-down" processing. The bottom-up processing, also known as "data-driven" processing, occurs when readers tried to focus on the most basic units of the texts such as words, individual meanings and grammatical structures, and based on these they tried to obtain contextual cues and to understand the whole text. According to the organization of the schemata, the bottom-level deals with the specific incoming data, which made the processing from bottom to the top inefficient. As stated in Carrell and Eisterhold (1983: 557), "bottom up processing is evoked by the incoming data; the features of the data enter the system through the best fitting, bottom-level schemata".

Some studies have been conducted to investigate the importance of bottom-up and top-down processing (Macaro & Erler, 2008). With regard to the role of bottom-up

processing, similar findings were found. Chamot and El-Dinary (1999) carried out a case study of 8 year old children in an immersion program in Canada and the results showed that less successful readers depended much on the phonetic decoding and were always trapped by details, however the more successful readers were more efficient in bottom-up processing. This finding was also in line with some other studies. In the study of Nassaji and Geva (1999), they investigated the role of two types of bottom-up processing, namely, phonological and orthographic processing skills, in adult second language reading. They investigated 60 ESL graduate students' (with Farsi as their native language) report on three types of ESL reading: reading comprehension, silent reading rate, and the ability to recognize individual words. Their findings showed that the efficiency of phonological and orthographic processing distinguished the successful readers from their less successful counterparts, and that less successful readers should be given more training in terms of bottom-up processing. Other scholars also suggested the positive role of bottom-up processing skills in successful L2 reading (Khatib & Fat'hi, 2012; Nation & Snowling, 2004) and of bottom-up processing instruction in efficient L2 reading (Ng, 2006). In the study of Ng (2006), she carried out an experimental study on the effectiveness of phonological skills instruction, in which one group of Chinese EFL students received phonological skills instruction in the class and another group without. The results showed that students with phonological skills instruction reported more effective L2 reading development than the other students. She further conducted this research between the students from two education levels (one primary school and one secondary school in Hong Kong). Interesting findings were found that phonological training at primary level was effective in improving the students' reading performance,

while the same instruction at secondary level showed no significant effect. It indicated that efficient bottom-up instruction should be taken at the early age of L2 reading.

In contrast, the top-down processing, also called *conceptually-driven*, is a more efficient way of information processing. It happens when readers try to predict and integrate the text with their prior background knowledge to help understanding, rather than rely on specific words or grammatical characteristics. As described in Carrel and Eisterhold (1983: 557), "top-down processing occurs as the system makes general predictions based on higher level, general schemata and then searches the input for information to fit into these partially satisfied, higher order schemata". Therefore, this processing of reading shows the interaction between the readers and the text, and is considered a higher level of information processing. Some studies also argued that the top-down processing, especially the application of background knowledge, was in strong relation to L2 comprehension (Floyd & Carrell, 1987; Hudson, 1982b). For instance, Hudson (1982b) found that L2 readers with a high degree of background knowledge can facilitate them to overcome the reading difficulties while reading. The major implication drawn from the top-down processing theory was that the background knowledge of L2 readers should be activated before reading certain materials (Barnett, 1989; Dubin & Bycina, 1991).

According to Rumelhart (1980) and Carrel and Eisterhold (1983), these two processes should be occurring at all levels at the same time. The bottom-up processing will facilitate readers to justify whether the incoming data fits or does not fit their

prediction of the contents or structures of the texts. And then the top-down processing will assure the readers when they come across uncertainty or adjust possible interpretation of the incoming information. To put it differently, the bottom-up processing deals with the incoming data and the conceptual prediction is generated by the top-down processing. According to the study of Macaro (2001) on 14 year-old L2 readers, the more successful readers tended to integrate both the bottom-up and top-down processing, while seldom sticking to one of them for a long time. One of the interesting findings was that less-successful readers sometimes overused their schemata (prior knowledge), which led to the over prediction of the text and inefficient reading.

In the recent decades, the implications of schema theory have received great success in improving reading instructions, and the theory has become the main focus of L2 reading research since 1980s (Grabe, 1991). The studies of Carrell (1983, 1987) and Carrell and Eisterhold (1983) have proved the importance of schema theory for EFL/ESL reading that students' comprehension of reading can be improved if the background knowledge were activated of the text before reading the whole text. Carrell (1989) also pointed out that the major reason of processing difficulty for L2 readers was the lack of schema activation.

Hudson (1982a) argued that the linguistic deficiencies can be conquered by a higher-level of background knowledge. Pritchard (1990) further verified the important role of cultural background on readers' reading comprehension. Besides, Shang and Zhang (2015) verified that the lack of appropriate schemata was the main cause of Chinese college

students' English reading difficulties. They carried out an experimental research on 90 non-English major college students. 45 participants were in the control group and the rest of them belonged to the experimental group. The reading test which was about the American Homestead Act (1862) was selected from the TOEFL reading passages, and most of the Chinese students were unfamiliar with it. In the experiment, the control group just read the passage without any aids, while the experimental group received the teachers' instruction about the background knowledge of Homestead Act of 1862 before taking the test. The results showed that the reading scores of the experimental group were higher than the control group, which indicated the important role of schemata on EFL students' reading performance. To sum up, all of these previous studies prove the important role of schema theory in the teaching and learning of L2 reading.

Besides the investigations on the two models of reading process above, recent scholars were more interested in understanding what skilled or successful readers do when reading, what strategies they tend to apply and in what way they use different strategies of reading in another language (Sheorey & Mokhtari, 2001). Thus, in the next section, the recent research trend of reading strategies and related studies will be illustrated.

2.1.3 The Strategies of Reading

In the last decades, research on language learning strategies was established and the

typical strategies used by successful language learners were identified so that less successful readers can learn these strategies and improve their reading skill (Uhrig, 2015). As stated in O'Malley and Chamot (1990: 1), "language learning strategies are special thoughts and behaviors that individuals use to help them comprehend, learn, or retain new information". Meanwhile, Oxford (1990:8) described them as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferrable to new situations". Later on, Dörnyei (2005) argued that the concept of learning strategies was more complex and it should be considered as a combination of "learning styles, motivation, and task", and these characteristics kept changing as the learners' experiences increased. Although the definition of learning strategies is still under discussion, it is agreed that the strategies of language learning are complex cognitive procedures that learners are conscious in using them to resolve incoming information and acquire new knowledge.

According to O'Malley and Chamot (1990), the language learning strategies can be classified into three broad categories, namely, cognitive, metacognitive, and social/affective strategies. Cognitive strategies relate to the strategies that learners utilize to organize, summarize, infer, and elaborate the language input. Metacognitive strategies include the conscious actions like "monitoring or elaborating" which help the learners to evaluate their own learning process. Social or affective strategies involve the interactive actions that learners take to make learning more active, such as practicing with peers, asking questions of others and self-questioning.

The early studies on language learning strategies established a strong foundation for later research on learning strategies of individual language skills such as listening, speaking, reading and writing. Following these studies, research on reading strategies was fostered in recent years (Manoli, Papadopoulou, & Metallidou, 2016).

According to Grabe (2009), reading comprehension is a complicated intellectual activity which involves the integration of various knowledge, strategies and readers' prior knowledge to understand the texts. Erler and Finkbeiner (2007: 189) pointed out that "reading strategies are intentional actions chosen to facilitate reading at any level of processing". The use of reading strategies indicate that readers have enough sources for understanding (Anderson, 1991). The traditional well-known reading strategies included skimming the text, scanning for useful information, inferring the text according to context clues (Anderson, 1991; Carrell, 1989; Cohen, 1990). The more recent recognized reading strategies included activating schemata to guide understanding, recognizing text structure, visualizing, monitoring or adjusting one's own thought while reading, evaluating certain strategy use and so on (Pressley, 2002; Zhang et al., 2008). In order to understand how L2 readers read and comprehend, it is crucial to investigate what reading strategies they apply and in what circumstance that they apply certain strategies.

Initially, the L2 reading research focused on the differences among the individuals in reading strategy use to distinguish the proficient and less proficient readers. The main findings of this line of research showed that high-achieving readers applied more types of reading strategies depending on the nature of the task as compared to the low-achieving

readers (Manoli et al, 2016). For example, in the study by Anderson (1991), he investigated the individual differences in strategy use among adult L2 readers by using think-aloud protocols. One of his findings suggested that although poorer readers were aware of the correct reading strategies, they did not know how to apply them in the right place to assist reading. In contrast, proficient readers were more confident to apply a given strategy and were more successful in L2 reading. He also proposed that the poorer readers' weakness in vocabulary control and lack of general background knowledge were two potential reasons which might explain their failure in applying different reading strategies.

The results were also in line with the study by Kletzien (1991). Kletzien examined 48 (24 good readers and 24 poor readers) high school students' application of reading strategies. After comparing directly between the two groups of readers, the findings showed that although the two groups applied the same amount and types of reading strategies when reading easy texts, when the texts become harder, good readers used more strategies than the poor readers. Saricoban (2002) further proved that differences in the use of reading strategies between successful and less successful readers occurred when reading advanced level of materials. Poole (2005) also pointed out that high-achieving readers reported more use of various types of reading strategies, such as "evaluation/integration and regulation strategies", which means to evaluate reading strategies used while reading and regulate and adjust strategies, in Denton et al (2015), and post-reading strategies like "recalling contents", "finding other sources", and "approaching lecturers for further explanation" in Nordin, Rashid, Zubir, and Sadjirin

(2013). It was believed that skilled readers apply a range of strategies that vary in form and function and change in line with the requirements of text (Pressley & Afflerbach, 1995).

Besides, the factor of gender has also been investigated in studies of Poole (2005) and Denton et al (2015), in order to find out individual differences in the use of reading strategies. After investigating 248 (138 male; 110 female) ESL students, Poole concluded that few differences in using reading strategies were found between male and female ESL readers. However, in the study by Denton et al (2015), significant differences were found between male and female ESL readers. After investigating a larger sample of 1134 students, they concluded, which was in contrast with Poole (2005), that females reported higher application of all the reading strategies (integration, note-taking and regulation) than males.

Another trend of L2 reading strategies research concentrates on reading strategies instructions among EFL/ESL readers, especially how to improve poor readers' reading achievement through reading strategy instruction (Koda, 2005; Manoli et al, 2016). In the early days of 1990s, scholars suggested that reading strategy instruction should be introduced into the regular class (Numrich, 1989; Oxford, 1990). They further advocated that the emphasis of reading class should be shifted from test comprehension to the teaching of reading strategies and techniques.

Zhang (1992) carried out an empirical study investigating the effect of reading strategies instruction on ESL readers. In his study, 29 students were separated into two groups, in which the experimental group received pre-reading assistance on suggested reading strategies, key words explanation and background knowledge instruction, and the control group knew nothing before reading. The results indicated that the introduction of reading strategies especially memory strategy, cognitive strategy and compensation strategy did improve the experimental group students' reading achievement compared to the control group students. Later, in the study of Song (1998), the results were in line with Zhang (1992) that the instruction of reading strategy was necessary in building up EFL/ESL reading comprehension. Then the explicit and direct reading strategies training pedagogy were suggested in teaching adult students in academic settings. Further studies (Gaskins, 1998; Shen, 2003; Torgesen & Burgess, 1998) also showed that EFL/ESL learners were able to become better readers if they received appropriate reading strategies instruction.

More recent trend in L2 reading strategies instruction research concentrates on investigating multiple-strategy instruction rather than individual strategy instruction (Dole, Nokes, & Drits, 2009; Grabe, 2009). The multiple strategy instruction perceives reading as a dynamic process, and teaches the readers to deploy a repertoire of strategies and to orchestrate the appropriate strategies according to different reading problems and purposes (Davis, 2012; Grabe, 2009). For instance, while reading, a successful reader will apply multiple strategies to make a prediction of the incoming material, applying their prior knowledge when reading, searching main points actively, and evaluating whether

the text has been understood or not.

The effectiveness of reading strategies instruction was investigated in some studies. Zhang (2008) applied a two-month multiple reading strategies instruction among 99 Chinese EFL students and the result showed that students' general reading performance was improved after the instruction. Aghaie and Zhang (2012) also confirmed the efficiency of multiple reading strategies training on Iranian EFL students, and Akkakoson (2013) verified on Thai EFL students. Dabarera, Renandya, and Zhang (2014) indicated that multiple reading strategies instruction not only improved L2 readers' reading performance but also increased their metacognitive awareness of using reading strategies.

Other studies of reading strategies are also interested in investigating readers' application of reading strategies in different cultural backgrounds. A number of differences in using reading strategies are found among students from different cultural groups. For instance, Parry (1996) conducted a comparative study between Nigerian and Chinese students' utilization of reading strategies while reading and the findings showed that Nigerian students preferred to use top-down reading strategies while the Chinese students reported a marked tendency to apply bottom-up strategies to solve comprehension problems.

Later on, Mokhtari and Reichard (2004) compared the application of reading strategies between native U.S. students and ESL Moroccan students. The findings revealed that Moroccan students recorded more usage of certain types of reading

strategies compared to the U.S. students. In a series of studies (Akamatsu, 2003; Bang & Zhao, 2007; Koda, 1988, 1989, 1998, 2000), differences were found between readers from orthographic background (Chinese and Japanese) and readers from phonologic backgrounds (Korean and Persian); the latter group of readers were more efficient in the processing of reading as they relied more on phonological strategies like sounding out the words and recognizing rhythm, in order to facilitate reading comprehension. Whereas Chinese and Japanese readers depended more on orthographic strategies like using visual system to form, store or recall words and trying to write out certain words while reading, which took more effort when reading in English. The above cross cultural investigations on readers' use of reading strategies indicate that the reading strategies used by L2 readers differ in various cultural contexts, and that the readers' first language (L1) does have an impact on their processing of reading in L2. Therefore, it is necessary to discuss the effect of L1 on L2 when reading in L2 and transferring reading skills from L1 to L2 in the next section.

2.1.4 The Effects of L1 on L2 Reading

Generally, reading in a L2 involves the interplay of two language systems, namely, the first language (readers' native language) and the L2 system. According to Upton and Lee-Thompson (2001), one factor that has an effect on L2 readers' reading comprehension is "mental translation" described by Kern (1994: 442) as "the mental reprocessing of L2 words, phrases, or sentences in L1 forms while reading L2 texts".

Cook (1996) argued that mental translation is a common cognitive strategy that all L2 readers apply when reading in L2, and high school learners and adult learners rely heavily on this strategy (Kern, 1994). Akamatsu (2003) agreed that readers' mother tongue play a significant role in L2 reading acquisition.

During the last decades, a large number of studies have been conducted to testify the influences of readers' L1 on the L2 reading comprehension. For example, Cohen (1995) conducted a research on bilingual and multilingual college students to examine the causes that affected their reading process. His findings showed that both bilingual and multilingual students shifted between languages in a frequent way. He found two forms of language shifting, one was "unintentional", referring to students' comfort and frequent shifting between languages and the brains' automatically shifting; the other one was "intentional", referring to students' use of their mother tongue or additional native languages to help understand the grammars or vocabulary of the target language.

Kern (1994) investigated L2 readers' use of mental translation as a cognitive strategy to facilitate reading. He found that the participants frequently used mental translation to help L2 reading, especially when they encountered some reading obstacles, such as unfamiliar vocabulary and grammar structures. Hawras (1996) also found that the advanced readers benefited more from the mental translation than the less advanced readers. In a later study of Upton (1997) and Upton and Lee-Thompson (2001), the findings revealed that as the L2 readers' language proficiency increased, their reliance on L1 reduced. These studies revealed the significant role of L1 on L2 reading

comprehension in that L2 readers used L1 to help them understand unfamiliar words and sentences, predict context, confirm prediction and comprehension and monitor reading behavior, which displayed the sociocultural aspect of L2 reading comprehension (Upton & Lee-Thompson, 2001).

In the above section, various aspects (the psycholinguistic model of reading, the schema theory model of reading, the strategies of reading and the effects of L1 on L2 reading) relating to L2 reading are introduced. In the next section, the definition of metacognition and the related studies on metacognitive awareness and L2 reading are explained.

2.2 Metacognition

In the 1980 - 1990s, research in learning strategies and self-directed learning had recognized the role of metacognition or metacognitive knowledge in language learning (Wenden, 1998). According to Ouellette (2006), the goal of reading is to construct meaning and understanding of the text. The reading process is considered effective when readers execute metacognitive actions during reading, such as making plans before reading, monitoring reading process during reading, and self-evaluating reading experience after reading (Carrell, Gajdusek, & Wise, 1998; Kraayenoord, 2010). Therefore, in this section, the definition of metacognition, and the previous studies regarding metacognitive awareness of reading strategies are reviewed and discussed.

2.2.1 Definition of Metacognition

In the last decades, a number of researchers have defined metacognition in many ways (e.g. Flavell, 1979; Livingston, 1979; Schraw, 1998; Wenden, 1998). The notion of metacognition was first introduced by a psychologist, John Flavell. Flavell (1979) described metacognition as below:

> "Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them…For example, I am engaging in metacognition…if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as a fact…Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes…usually in the service of some concrete goal or objectives."

Flavell (1979) argued that metacognition is a specialized portion of learners' knowledge base, which is learned formally or informally by learners. Brown, Bransford, Ferrara, and Campione (1983) pointed out that one characteristic of metacognition is that it is statable, in other words, learners are aware of their own thoughts and are able to articulate what they are thinking and what they know. Livingston (1997) explained that metacognition is common and it happens in our daily life. Whatever activities such as making a plan before doing something, setting a specific goal to achieve a given task, monitoring the activity, and evaluating the completion of the given task, were metacognitive activities. Schraw (1998: 113) proposed that "metacognition is a multidimensional phenomenon", and the skill of "metacognitive knowledge and regulation can be improved using a variety of instructional strategies".

Applied to language learning process, Wenden (1998) defined metacognition as positive control and regulation of one's cognitive process. Wenden believed that the investigation of L2 learners' metacognition can provide the researcher with significant information about how they perceived the process of language learning. Vandergrift, Goh, Mareschal, and Tafaghodtari (2006) stated that metacognition involved learners' thinking about their own thinking and the ability to consciously control their mental process. Veenman, Van Hout-Wolters, and Afflerbach (2006) argued that the concept of metacognition is complex. They defined metacognition as a higher-order cognition about cognition, that it was part of cognition and simultaneously examining and regulating the cognitive system.

2.2.1.1 Components of Metacognition

In the recent years, many studies have been carried out to discuss the components of metacognition (see Flavell, 1979; Sheorey & Mokhtari, 2001; Wenden, 1998; Zhang, 2001; Zhang & Wu, 2009). According to Flavell (1979), there are two components of metacognition, namely, metacognitive knowledge and metacognitive regulation. Metacognitive knowledge indicates the stable information that learners' know about the learning process (Wenden, 1998). It includes reader's knowledge about their "own cognitive resources", and "the compatibility between the reader and the reading situation" (Carrell, 1989:122). As an example, if the readers are aware of what they need to complete the reading task more effectively, then they will be easier to fulfill the request of a reading

demand. However, if they are not conscious of their own limitations or difficulty of the reading, they can hardly make predictions of the reading task or be ready for any reading difficulties.

Flavell (1979) categorized three components of metacognition as "person, task and strategy knowledge", and was further applied to language learning by Wenden (1991). The same kinds of metacognitive knowledge among language learners were identified. Person knowledge is general knowledge about human factors, such as age, motivation, language aptitude and learning styles, which learners have acquired that may facilitate or restrain learning. It also includes learners' specific knowledge about how the above factors weave into their language learning experience. For example, a L2 learner may believe that he/she does not have the personal ability to complete a task. Besides, person knowledge contains learners' beliefs about how effective they are regarding learning, which means that learners acquired self-efficacy beliefs about their ability to manage important learning resources and to maintain beliefs and efforts. Finally, person knowledge refers to learners' beliefs about their ability to achieve certain learning goals. For example, learners anticipate their ability of the knowledge or skills they needed in L2 listening tasks.

In the taxonomy, the task knowledge of metacognitive knowledge involves three aspects. First, it represents what learners know about the aim of learning a task and what impact it will play on their language learning needs, such as expanding vocabulary, improving listening and communication skills. Second, it includes learners' knowledge

about the purpose and nature of a particular learning task. For example, learners may find out that the nature of learning to read is different from the nature of learning to write through their experience. Or, they are able to differentiate a problem solving task from a critical thinking task. The third component of task knowledge includes knowing about the demands of a task. For example, a task may require learners to learn in general or to learn a particular task or skills in detail. Finally, strategic knowledge refers to learners' general knowledge about what strategies to use, in what way they are useful and how and when to apply them in order to obtain specific learning goals.

The second component of metacognition is metacognitive regulation, researchers like Nelson (1996) also defined it as metacognitive experiences. Metacognitive regulation is "executive in nature" (Zhang & Wu, 2009). It refers to learners' consciously using of their metacognitive knowledge or certain learning strategies to meet a cognitive goal. This process involves metacognitive strategies such as planning, monitoring, evaluating, and problem-solving to achieve learning goals (Zhang & Wu, 2009).

2.2.2 Definition of Metacognitive Awareness

Metacognitive awareness is another name for metacognition and basically refers to the same thing as metacognition (Zhang, 2001). In the literature, the terms metacognition, metacognitive knowledge and metacognitive awareness refer to the same concept, and the term metacognitive awareness is generally applied in educational psychology,

cognitive psychology and language learning study to mean readers' awareness of metacognition, thinking about one's own thinking and active control or regulation over the cognition (Hacker, 1998; Zhang, 2001). Therefore, in the following sections, the term metacognitive awareness was used in this study instead of metacognition and metacognitive knowledge.

The concept of metacognitive awareness has successfully help L2 researchers to better analyze L2 learners' use of learning strategies (Zhang, 2001). Metacognitive awareness is defined in similar ways when applied to L2 reading research, especially the research on reading strategies. As stated in Sheorey and Mokhtari (2001: 433), it was broadly defined as "the deliberate, conscious procedures used by readers to enhance text comprehension – indicates the need to increase our understanding of readers' meta-cognitive knowledge about reading and reading strategies to develop them into active, constructively responsive readers".

2.2.3 Related Studies on Metacognitive Awareness and L2 Reading

In the above section, the definition of metacognition, components of metacognition and the important role of metacognitive awareness in L2 reading are discussed. The following section will introduce previous studies relating to metacognitive awareness and L2 reading.

The investigations on the relationship between metacognitive awareness and reading comprehension were initiated by Myers and Paris (1978). They first examined the role of metacognition in their study, aiming to understand children's metacognitive knowledge and awareness of reading strategies. Later on, the focus of the research has shifted to investigate the differences of metacognitive awareness among readers with different language proficiency levels. For example, the study of Pressley and Afflerbach (1995) revealed that readers with high proficiency level of reading reported higher level of metacognitive awareness towards reading compared with readers with low proficiency level. The findings were in line with other studies which examined readers' metacognitive awareness and their actual application of reading strategies (Paris, 2002; Sheorey & Mokhtari, 2001), that there was a link between metacognitive awareness and level of reading proficiency. For instance, Sheorey and Mokhtari (2001) carried out a comparative research on the variations in the metacognitive awareness of reading strategies between native English speakers and non-native (ESL) speakers. The findings of their study indicated that firstly both the native speaker's group and the ESL group reported the metacognitive awareness of most of the reading strategies listed in the questionnaire; secondly, the students with the high-reading-proficiency level in both groups showed higher metacognitive awareness in global strategies and problem-solving strategies, compared with their low-reading-proficiency counterparts.

Later on, the focus shifted to L2 and EFL contexts. As Dabarera et al (2014) pointed out, metacognition was featured when readers were conscious of the gap between their understanding and the reading text. In order to fill the gap, the readers will utilize

appropriate reading strategies to cope with the reading difficulties. In this aspect, metacognition functioned as a mechanism to stimulate readers' awareness to interact with the reading text. Therefore, many studies began to investigate readers' metacognitive awareness of reading strategies in the L2 and EFL contexts, such as Malcolm (2009) investigating the Arabic-speaking context, Magogwe (2013) in Botswana context, and Bai (2014), Huang (2004), Huang (2008), Wu (2007) and Zhang & Wu (2009) in the Chinese EFL context.

In an experimental study by Huang (2004), the author testified the efficiency of metacognitive awareness training in reading comprehension. 100 non-English major freshmen from two intact classes were selected. Class one was designed as control class and the other was designed as the experimental class. Huang adopted the model of Carrell et al. (1989) in training the metacognitive awareness of reading. The experimental class received the training for 14 weeks (28 hours). Whereas, the control class only received the normal reading training on difficult words, sentence structures, and important language points in the reading materials. Pre- and post-test of reading comprehension were taken to examine the change of reading achievement between the two groups. After 14 weeks, the results proved that firstly the training of metacognitive awareness of reading strategies was more effective than the traditional teaching model. Secondly, students' metacognitive awareness could not develop automatically, but should be taught explicitly through appropriate instruction. Thirdly, students' metacognitive awareness was significantly related to their English proficiency and reading proficiency.

Later on, Zhang and Wu (2009) investigated 249 second-year high school students from China. Three different English proficiency groups (low, intermediate and high) were identified based on students' mean scores of three English exams. The results based on the Survey of Reading Strategies (SORS) questionnaire showed that students' overall metacognitive awareness was at a high-frequency level. Besides, students' levels of metacognitive awareness were found significantly related to the English proficiency level. However, the study did not investigate how students' metacognitive awareness is related to their actual reading performance.

In another study, Wu (2007) investigated 230 second-year senior high school students' metacognitive awareness of reading strategies by using the Metacognitive Awareness of Reading Strategies Inventory (MARSI) questionnaire. The results indicated students' moderate level of metacognitive awareness and their preference of using problem solving strategies, followed by global and support strategies when reading in English.

The results in Wu (2007)'s study were in line with another study by Huang (2008) which examined 196 third-year middle school students' metacognitive awareness of reading strategies. In both the studies, positive relationship was found between students' metacognitive awareness level and their English and reading proficiency level, that was higher ability students reported higher level of metacognitive awareness when applying different reading strategies to cope with reading difficulties. Bai (2014) further verified that high reading ability students went first to apply problem-solving strategies, and then

global strategies, and significant difference was found between intermediate reading ability students and low reading ability students.

Besides examining Chinese students' metacognitive awareness of reading strategies among different reading proficiency levels, Shang and Zhang (2015) conducted an empirical research on the effectiveness of the increase of students' metacognitive awareness of reading strategies on their reading scores. In their study, 90 Chinese EFL college students were divided into two groups, in which the students in the control group were asked to self-report what reading strategies they were using when reading the tests, while the experimental group received both the teachers' instruction on reading strategies and the reading strategies identified by the control group. The results showed that students in the experimental group scored slightly higher than the students in the control group. Shang and Zhang (2015) further proposed that both the teachers and the students should not depend too much on reading strategies since the reading strategies came into play when the students were in an advanced level of English language. Besides, they concluded that it needed long-term training for the students' metacognitive awareness of reading strategies to be raised, and the effect of metacognitive awareness training cannot be obtained with only one class.

The above empirical studies afford a picture of Chinese students' metacognitive awareness of reading strategies when reading in English. However, a few studies investigate how students' metacognitive awareness is related to their actual reading performance; in other words, only a few studies examine students' awareness of reading

strategies which can predict their actual reading performance.

Recently, Hou (2013) expanded the scope of the existing research by exploring the relationship between metacognitive awareness of reading strategies and learners' actual reading performance in an EFL context of Taiwan. In his study, a Metacognitive Awareness of Reading Inventory (MARSI) questionnaire and a General English Proficiency Test (GEPT) were distributed to 454 college students to investigate this relationship. The results indicated that both the overall metacognitive awareness of reading strategies and problem-solving subscales have a significant relationship with students' reading comprehension, which means that students who used more problem-solving strategies scored higher in reading test than those who used fewer. However, research on the relationship between learners' metacognitive awareness and the actual reading performance is still limited.

2.3 Summary

In this chapter, literature on the process of reading, the psycholinguistic mode of reading, the schema theory of reading, related studies on reading strategies, the effects of L1 on L2, definitions of metacognition, components of metacognition, and previous studies on metacognitive awareness of L2 reading are presented and discussed.

In addition, this study intends to consolidate the findings of previous studies (Bai, 2014; Huang, 2004; Huang, 2008; Wu; 2007 and Zhang & Wu, 2009) by investigating

the overall metacognitive awareness of reading strategies among Chinese EFL high school students. Besides, influenced by Hou (2013), this study intends to extend the scope of research by examining the relationship between students' metacognitive awareness and English reading performance.

Moreover, this study is based on three understanding illustrated below. Firstly, reading is an interactive and active process in which readers utilize their acquired knowledge to anticipate and extract meaning from the print text. Secondly, reading strategies are readers' "conscious, active, and self-directed" strategies for making meaning from the text (Zhang, 2001: 271). Thirdly, it is believed that L2 reader's metacognitive awareness plays a role in their reading process that readers who have clear metacognitive awareness of what strategies to use and of the reading tasks are different from the readers who do not have clear metacognitive awareness towards the reading process.

CHAPTER 3

METHODOLOGY

In this chapter, the key elements of research methodology are elaborated. The key elements include sampling, research instruments (reading performance exam and survey of reading strategies questionnaire), procedures and data analysis. The whole picture of research methodology is shown in Figure 3.1. The details are expanded in the following sections.

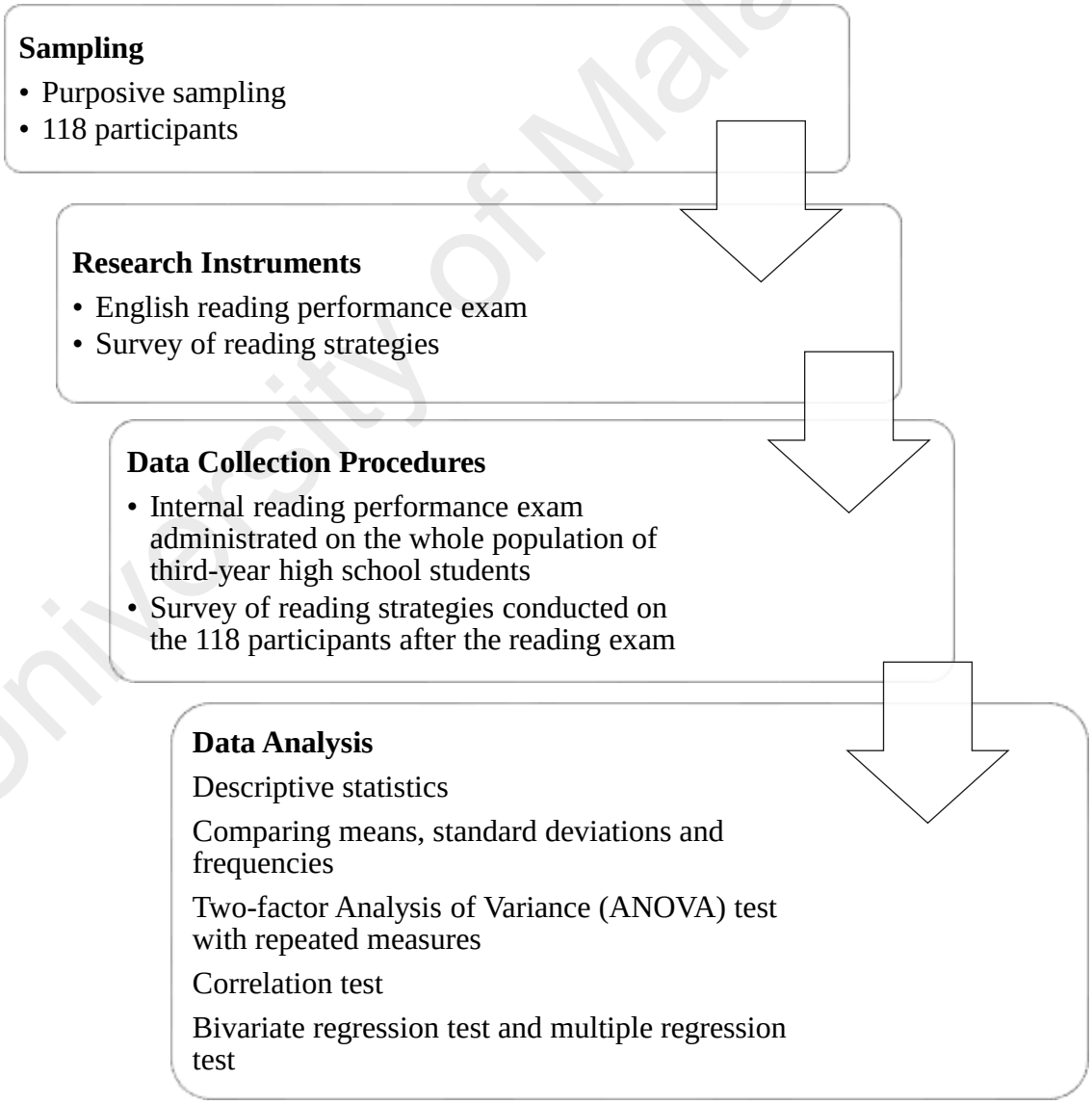

Figure 3.1: Description of research methodology

3.1 Sampling

With regard to the sampling, the study employed the purposive sampling method. The aim of the purposive sampling method is to ensure the equal distribution of the sample. Firstly, three different English proficiency levels were identified according to the classification standard provided by the school. 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 scored higher than 96 marks should be in the high proficiency level (see Table 3.1).

After determining the range of each proficiency group, the researcher employed the purposive sampling method and selected 120 students from a total number of about 700 third-year students. The aim of purpose sampling is to ensure that there is equal distribution of each proficiency group. Therefore, among the 120 students, 40 in the low proficiency level, 44 in the intermediate level and 36 in the high level. However, two students in the high proficiency group refused to participate in the research. So the total number of participants was 118 excluding 2 students from the high proficiency group. The background information of the participants and the description of the three proficiency groups are shown in Table 3.2 and Table 3.3.

Table 3.1: Description of three proficiency groups

Low proficiency group	Intermediate proficiency group	High proficiency group
0-72	72-96	96-120

Table 3.2: Background information of the participants (*N*=118)

		Frequency	Percent (%)
Gender	Male	37	31.4
	Female	81	68.6
	Total	118	100.0
Years of learning English	5 years	26	22
	6 years	67	56.8
	7 years	16	13.6
	8 years	7	5.9
	9 years	2	1.7
	Total	118	100
	Means	6	
Reading in English outside the classroom	Never	62	52.5
	Only Occasionally	33	28.0
	Sometimes	18	15.3
	Usually	3	2.5
	Always	2	1.7
	Total	118	100

Table 3.3: Description of three proficiency groups

		Frequency	Percent (%)
Valid	Low	40	33.9
	Intermediate	44	37.3
	High	34	28.8
	Total	118	100.0

As shown in Table 3.2, 68.6% of the participants are female and the male participants only account for 31.4%. Since the gender differences are not considered in this research, the uneven distribution of female and male participants will not affect the

research findings and are not considered the mediating variable in this study. About 78% of the participants report that they have been learning English language for more than 6 years, indicating a relatively long time of English language learning and experience. Besides, the differences among participants in the time of learning English will not affect the research since above 50% (78%) of the students reported the same period of time in learning English. In the next question – "How often do you read in English outside the classroom" – only 4.2% of the participants reported "usually" and "always", 28% of the participant read in English outside the classroom only occasionally, 15.3% of the participants sometimes chose to read English, and 52.5% of the students report that they never read English outside the classroom. The influence of "reading in English outside the classroom" will be further discussed in the results and discussion section to see whether it has an effect on the participants' metacognitive awareness of reading strategies.

3.2 Research Instruments

Research instrument is one of the important components of research methodology. In this section, two research instruments – reading performance exam and survey of reading strategies (SORS) – are explained in detail. Each instrument plays a vital role in realizing the present study. Additionally, the procedure of applying the two research instruments is provided in the later section.

3.2.1 Reading Performance Exam

The aim of the reading exam is to assess participants' English reading scores. In order to gain permission to conduct the research, and minimize disruption to the existing system of assessment for the school, the existing reading exam which is available in the school was used in this study.

The reading exam was a monthly English reading examination which was developed internally by the English teachers and administered on the whole population in the high school. There are mainly two parts of the reading exam. Part one includes four short passages with 15 multiple-choice questions. Part two is one 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.

3.2.2 The Survey of Reading Strategies (SORS)

The next instrument in the study is the *Survey of Reading Strategies* (SORS) questionnaire developed by Mokhtari and Sheorey (2002) (see Table 3.4). The aim of SORS is to assess EFL or ESL participants' metacognitive awareness and perceived use

of reading strategies while reading. SORS is developed from the *Metacognitive Awareness of Reading Inventory* (MARSI), which is first created 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, the items in it might not be suitable for second or foreign English learners. Thus, SORS is used in this study since the participants are Chinese EFL high school students.

Besides, in order to reduce the language barrier caused by the English version, a Chinese version of SORS adopted from Zhang and Wu (2009) was used to ensure the clarity and readability of the SORS items (see Appendix I**)**. Zhang and Wu (2009) revised the previous version of SORS from 30 items to 28 items by deleting one ambiguous and repetitive item (item 14 of MARSI) and combining two items (item 4 and 8 of MARSI) into one according to the results of a pilot test. The 28 items categorized three broad components of reading strategies as "Global Strategies (GLOB)" (12 items), "Problem-solving Strategies (PROB)" (7 items) and "Support Strategies (SUP)" (9 items) (see Appendix II). 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 certain strategy. In this revised version of SORS, the internal consistency reliability measured by Cronbach's alpha for "Global reading strategies (GLOB)" is $\alpha = .780$, "Problem-solving strategies (PROB)" is $\alpha = .790$ and "Support strategies (SUP)" is $\alpha = .85$, which was proven to be acceptable. The levels of metacognitive awareness were identified based on Oxford and Burry-Stock (1995)'s 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.

In addition, the participants were required to give their personal information such as gender, age and class information for further analysis. Besides, questions like “When you start to learn English?” “Do you read in English outside the classroom (reading in English for the purposes of exams and assignments were not considered extra English reading practices)”, were asked to complement for further data analysis and interpretation. All of the instructions were written clearly in Chinese, and were clearly explained to the participants by the researcher.

Table 3.4: The SORS items

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. bold face)
GS9	Checking understanding when come across new information
GS10	Guessing text meanings
GS11	Checking guessing or predictions
GS12	Analyzing and evaluating the information resented 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

3.3 Data Collection Procedures

Firstly, the reading performance exam was administrated among the whole population of the third-year high students including the 118 participants involved in this study. The whole exam section 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 administrated by the researcher. Before answering the questionnaire, participants were informed of the objectives of SORS and the requirements of filling in the questionnaire by the researcher. 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 section. The researcher was in charge of answering the questions that students posed during this section. 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 examined by the researcher were valid for data analysis.

3.4 Data Analysis

In general, this study is an empirical study using quantitative analyzing methods. The aim was to measure participants' overall level of metacognitive awareness of reading strategies, variances of strategy use within different proficiency groups and the relationship between metacognitive awareness of reading strategies and the participants' actual English reading performance. The data analysis procedure involved presenting descriptive statistics, comparing means, standard deviations and frequencies, a two-factor Analysis of Variance (ANOVA) test with repeated measures, correlation test, bivariate regression test, and multiple regression test.

In order to answer research question one, "What are the levels of metacognitive awareness of reading strategies among Chinese EFL high school students?", the means, standard deviations and per item averages on SORS and its subscales were calculated to display the general pattern of students' metacognitive awareness of reading strategies.

The measurement of distinguishing students' levels of metacognitive awareness of reading strategies was based on three levels, namely, *high* (mean of 3.5 or higher), *moderate* (mean of 2.5 to 3.4), and *low* (mean of 2.4 or lower), which were suggested by Oxford and Burry-Stock (1995) for assessing strategy use in language learning and were also applied by Zhang and Wu (2009) in assessing Chinese high school students' metacognitive awareness of reading strategies.

Additionally, in terms of research question two, "What are the differences among low-, intermediate-, and high-proficiency students' levels of metacognitive awareness of reading strategies?", firstly, the data of means and standard deviations for the low, intermediate and high proficiency students' levels of metacognitive awareness of reading strategies were displayed to compare the results within the three different proficiency groups.

Secondly, after simply solving the basic idea of research question two, further investigation was conducted to find out if the categorizing of metacognitive awareness of reading strategies (SORS) and the grouping of three proficiency levels have a significant impact on the students' report of metacognitive awareness levels. Thus, a two-factor ANOVA with repeated measures was applied aiming to compare the mean differences between the groups that have been split on two within-subjects factors (also known as independent variables), meaning that each individual variables (IV) has two or more groups, or undergone two or more conditions. Each group or condition affects the dependent variables (DV), and the interaction (repeated measures) between each group

or condition of the two IVs also impact on DV. The conceptual framework of this study has the DV at the level of metacognitive awareness of reading strategies from 1 to 5. The two IVs were: the frequency use of the three categories of reading strategies (GLOB, PROB and SUP) set as the within-subject and the between-subject factor was the learners' proficiency levels (low, intermediate, high). The aim of the two-factor ANOVA with repeated measures was to test both the two IVs' effect on the DV and the interaction between the three conditions of each IV's effect on the DV.

Thirdly, after the two-way factor ANOVA, a correlation analysis test was conducted to examine the relationship between students' metacognitive awareness reflected by individual item of SORS questionnaire and their English proficiency levels. The DV is the means of individual item of SORS questionnaire reported by each participant and the IV is the level of their English proficiency. A Pearson correlation test was conducted to better test the strength of the linear association between the DV and IV. The value of a correlation coefficient (*r*) ranges between -1 and 1.The strongest linear relationship is indicated by a correlation coefficient of -1 or 1. A positive correlation means that if one variable gets bigger or stronger, the other variable tends to get bigger or stronger, whereas a negative correlation means that if one variable gets bigger or stronger, the other variable tends to get smaller or weaker.

Regarding research question three, "What is the relationship between students' metacognitive awareness of reading strategies and their actual reading performance?", descriptive statistics of students' English reading performance were analyzed. And the

correlation analysis between the students' English proficiency and their reading performance was conducted. Additionally, a bivariate regression analysis was conducted to evaluate the relationship between the students' metacognitive awareness of reading (IV) as measured by SORS and reading performance (DV) as measured by the reading exam, and to investigate the extent to which that metacognitive awareness of reading strategies (IV) predicted actual reading performance (DV).

In order to answer research question four, "How do the three aspects (global, problem-solving and support strategies) of metacognitive awareness of reading strategies relate to their reading performance?" Descriptive statistics of students' English reading performance were analyzed. A multiple regression test was further conducted to explore the relationship between the individual factors – three aspects of metacognitive awareness of reading strategies (IV), and students' reading performance (DV). The correlations between individual factor and reading performance were calculated and compared. Furthermore, the differences were investigated in terms of the levels of the three aspects of metacognitive awareness of reading strategies between successful readers and unsuccessful readers. The coding of the above data took three weeks. All the data were coded prudently by the researcher by using SPSS Statistics version 22.0.

3.5 Summary

In the above sections, the research methodology was presented. In general, this research is a quantitative and empirical study. The justification of sampling and two major

research instruments were demonstrated. The procedure of data collection was provided. The explanation of using two-factor ANOVA with repeated measures test, Pearson correlation test, bivariate and multiple regression test for data analysis were illustrated. In the next chapter, the results and discussions following the research methodology will be presented.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, the results regarding the four research questions raised in Chapter 1 are presented and discussed. The data were collected through purpose sampling of 118 third-year high school students in Qiqihar high school, China. The students were asked to first attend an English reading exam followed immediately by answering the questionnaire – SORS. All the data were coded through the software SPSS. The data analysis procedure involved presenting descriptive statistics, comparing means, standard deviations and frequencies, two-factor ANOVA with repeated measures test, correlation test, bivariate regression test, and multiple regression test.

4.2 Levels of Metacognitive Awareness of Reading Strategies

In this section, the results regarding the first research question raised in Chapter 1 are presented and discussed. The research question is "What are the levels of metacognitive awareness of reading strategies among Chinese EFL high school students?" To answer the first research question, the levels of metacognitive awareness of reading strategies among Chinese EFL high school students in general are presented first.

In respect of solving the first research question, Table 4.1 presents the descriptive statistics on the students' mean frequency of metacognitive awareness of reading strategies in individual strategies (items 1 to 28) and overall mean frequency of metacognitive awareness of the three categories (global strategies, problem solving strategies and support strategies) respectively.

The results showed that students' metacognitive awareness of reading strategies were at a moderate level (M=3.14, SD=0.62). As shown in Table 4.2, 8 strategies (28%) of the 28 reading strategies reported by the students went to high-awareness level ($M \geqslant 3.5$), 17 strategies (61%) were at medium-awareness level ($2.5 \leq M < 3.5$), and 3 strategies (11%) fell into low-awareness level ($M < 2.5$). Among the 28 strategies, students reported higher levels of metacognitive awareness on five strategies arranged in descending order by their means. The five top strategies were under Global strategies and Problem-solving strategies respectively as presented in Table 4.3, indicating which strategies were most favored or most aware of by the students involved in this study.

Table 4.1: Students' metacognitive awareness of reading strategies (N=118)

Items	Name	Strategy	*M*	S.D.
1	GS1	Setting purpose for reading	3.09	1.27
2	GS2	Checking how text content fits purpose	2.63	1.18
3	GS3	Previewing text before reading	3.14	1.27
4	GS4	Determining what to read and what to ignore	2.94	1.13
5	GS5	Using prior knowledge to help reading	3.81	1.03
6	GS6	Using text features (e.g. figures) to facilitate reading	3.61	1.18
7	GS7	Using context clues	3.74	1.05
8	GS8	Using typographical aids (e.g. bold face)	3.51	1.26
9	GS9	Checking understanding when come across new information	3.07	1.12

10	GS10	Guessing text meanings	3.67	1.09
11	GS11	Checking guessing or predictions	3.16	1.18
12	GS12	Critically analyzing the information resented in the text	2.39	1.09
13	PS1	Reading slowly and carefully	3.36	1.08
14	PS2	Adjusting reading speed	3.57	.99
15	PS3	Pausing and thinking about reading	3.33	1.13
16	PS4	Picturing or visualizing information read	3.02	1.21
17	PS5	Re-reading for better understanding	3.47	1.22
18	PS6	Guessing meaning of unknown words	3.65	.91
19	PS7	Trying to concentrate on reading	3.68	1.03
20	SS1	Taking notes while reading	2.68	1.27
21	SS2	Underlining information in text	3.22	1.18
22	SS3	Reading aloud when text becomes hard	2.31	1.26
23	SS4	Using reference materials	2.73	1.04
24	SS5	Paraphrasing for better understanding	2.69	1.13
25	SS6	Going back and forth in text	3.42	1.07
26	SS7	Asking oneself questions	1.91	.98
27	SS8	Translating from English to native language while reading	2.53	1.14
28	SS9	Thinking in both English and native language while reading	3.36	1.10
	GLOB	**Global Strategies**	**3.23**	**0.63**
	PROB	**Problem-solving Strategies**	**3.44**	**0.65**
	SUP	**Support Strategies**	**2.76**	**0.58**
	ORS	**Overall Reading Strategies**	**3.14**	**0.62**

Table 4.2: Three levels of students' metacognitive awareness of reading strategies

Levels	Items	Percentage (%)
High-awareness level	5, 6, 7, 8, 10, 14, 18, 19	28%
Medium-awareness level	1, 2, 3, 4, 8, 9, 11, 13, 15, 16, 20, 21, 23, 24, 25, 27, 28	61%
Low-awareness level	12, 22, 26	11%

Among the three categories, global, problem-solving and support strategies of SORS, students reported the highest metacognitive awareness level on problem-solving strategies (*M*=3.44), followed by global strategies (*M*=3.23) and lastly support strategies

(*M*=2.76). Within the problem-solving category, 4 out of 7 strategies (57%) were reported as high-awareness level, which revealed that students were aware of using problem-solving strategies during reading comprehension process and were conscious of applying strategies to deal with reading difficulties. For instance, students tried to "get back on track when losing concentration" (item 19, *M*=3.68, *SD*=1.03). When they encountered some unknown words while reading, they managed to "guess the meaning of unknown words or phrases" (item 18, *M*=3.65, *SD*=0.91). They were able to "adjust reading speed according to what I am reading" during reading comprehension (item 14, *M*=3.57, *SD*=0.99). When the reading material became difficult, they also tried to "re-read it to increase understanding" (item 17, *M*=3.47, *SD*=1.22).

Table 4.3: Reported reading strategies used most and least by Chinese EFL high school students

Name	Strategy	*M*
GS5	**Using prior knowledge to help reading**	**3.81**
GS7	**Using context clues**	**3.74**
PS7	**Trying to concentrate on reading**	**3.68**
GS10	**Guessing text meanings**	**3.67**
PS6	**Guessing meaning of unknown words**	**3.65**
GS6	Using text features (e.g. figures) to facilitate reading	3.61
PS2	Adjusting reading speed	3.57
GS8	Using typographical aids (e.g. bold face)	3.48
PS5	Re-reading for better understanding	3.47
SS6	Going back and forth in text	3.42
PS1	Reading slowly and carefully	3.36
SS9	Thinking in both English and native language while reading	3.36
PS3	Pausing and thinking about reading	3.33
SS2	Underlining information in text	3.22

GS11	Checking guessing or predictions	3.16
GS3	Previewing text before reading	3.14
GS1	Setting purpose for reading	3.09
GS9	Checking understanding when come across new information	3.07
PS4	Picturing or visualizing information read	3.02
GS4	Determining what to read and what to ignore	2.94
SS4	Using reference materials	2.73
SS5	Paraphrasing for better understanding	2.69
SS1	Taking notes while reading	2.68
GS2	**Checking how text content fits purpose**	**2.63**
SS8	**Translating from English to native language while reading**	**2.53**
GS12	**Critically analyzing the information resented in the text**	**2.39**
SS3	**Reading aloud when text becomes hard**	**2.31**
SS7	**Asking oneself questions**	**1.91**

In addition to being aware of applying different problem-solving strategies to cope with reading difficulties, students also possessed the ability to apply global strategies to predict the reading content by "using prior knowledge (e.g., knowledge about the theme of the text, or grammar knowledge) to help reading comprehension" (item 5, *M*=3.81, *SD*=1.03), "using context clues to help better understand reading" (item 7, *M*=3.74, *SD*=1.05), and "guessing what the content of the text is about when reading" (item 10, *M*=3.67, *SD*=1.09). Besides, students also reported to be highly aware of using "tables, figures, and pictures in text to increase understanding" (item 6, *M*=3.61, *SD*=1.18), and of detecting key information by "identifying typographical features like bold face and italics" (item 8, *M*=3.48, *SD*=1.26). However, students reported moderate metacognitive awareness level in some strategies like "having a purpose in mind and setting goals for reading" (item 1, *M*=3.09, *SD*=1.27), "thinking about whether the content of the text fits

my reading purpose" (item 2, *M*=2.63, *SD*=1.18), "reviewing the text to know about its length, organization and main idea" (item 3, *M*=3.14, *SD*=1.27), and "deciding what to read or ignore" (item 4, *M*=2.94, *SD*=1.13). These may indicate the students' lack of awareness of making plans and setting goals before reading, and their lack of ability of adjusting the reading strategies according to their reading purposes. The lowest awareness level went to item 12 (*M*=2.39, *SD*=1.09) "critically analyzing and evaluating the information presented in the text rather than passively accept everything", which revealed that students were in a passive relationship with the reading content, and they were not used to critically analyzing what they were reading because of the massive and rigid reading practices they received in the classroom.

With regard to the support strategies category, students reported moderate awareness level in general. The top three items reported by the students were "going back and forth in the text to find relationships among ideas in it" (item 25, *M*=3.42, *SD*=1.07), "thinking about information in both English and my mother tongue" (item 28, *M*=3.36, *SD*=1.10), and "underlining or circling information in the text to help remember it" (item 21, *M*=3.22, *SD*=1.18), indicating their ability to combine different aids to facilitate understanding and enhance memorizing. Besides, other support strategies like "using reference materials (e.g., a dictionary)" (item 23), "paraphrasing" (item 24), "note-taking" (item 20), and "translating from English into Chinese" (item 27) were also espoused by the students to be strategies which were less favored compared with previous items. The lowest awareness level were reported to be item 26 "I ask myself questions I like to have answered in the text" (*M*=1.91, *SD*=0.98), which again revealed that students were in a

passive position during the reading process. In general, the results suggested that students were aware of the different types of strategies while reading; in addition, it also suggested that students can apply and to a lesser degree, adjust their strategies for the various reading purposes.

The above results showed that students' metacognitive awareness of reading strategies as measured by SORS was at a moderate level, which was in line with Wu (2007) and Huang (2008). However, the results contradicted the conclusion of Zhang and Wu (2009) that Chinese EFL high school students reported a high level of metacognitive awareness of English reading and were thus considered active reading strategies users.

One possible reason suggested by Zhang and Wu (2009) was that the comprehension-testing model which was applied widely in the EFL English reading classroom played a vital role in getting students engaged in acquiring reading strategies without being conscious of it. The results that students have a moderate level of metacognitive awareness of reading strategies indicated, however, that comprehension-testing model may have a negative effect on students' metacognitive awareness of using multiple reading strategies; more importantly, this strengthen the idea that the benefits or limitations of comprehension-testing model needed to be further investigated.

The second reason suggested by Zhang and Wu (2009) was that the learning of English in the Chinese context had an impact on students' metacognitive awareness of reading strategies. Compared with Zhang and Wu (2009)'s study, which involved high

school students in Hainan province of China, the present study was conducted in Heilongjiang province which was a relatively remote region of China and English was not needed in daily life. Although the participants in the present study had learned English for an average of six years, they reported limited exposure to English reading except for reading in English in the classroom and English exams. Thus, it can be assumed that the considerably poor English learning environment accounted for the students' moderate level of metacognitive awareness of English reading strategies to some extent.

According to the overall moderate level results, students reported the highest level of metacognitive awareness on problem-solving strategies in an overall moderate level. This results were in line with Field (1984)'s observation that Chinese EFL students preferred to apply "process strategies" rather than "abstract strategies". Based on the psycholinguistic model of the EFL/ESL reader proposed by Coady (1979), the students in the present study were considered novice L2 readers since they concentrated more on "process strategies" and rigid recognition of the words in the text.

Besides, as suggested by Grabe and Stoller (2002) and Zhang, Gu, and Hu (2008), L2 readers tended to utilize the strategies they know in L1 reading to facilitate L2 reading since some of the reading strategies were interchangeable between native language and second/foreign language. For example, the top three problem-solving strategies reported by the students involving adjusting reading speed, guessing unknown words or phrases and keeping concentration on reading were also applicable in reading Chinese. Therefore, it can be assumed that transferring the strategies of reading Chinese (L1) to reading

English (L2) was a possible factor that contributed to students' high metacognitive awareness of using problem-solving strategies.

Moreover, some evidence revealed that students in the present study lack the metacognitive awareness of global strategies like making plans and setting goals before reading and having a purpose in mind while reading. The students reported relatively lower levels of metacognitive awareness (*M*=3.23, *N*=118) on global strategies compared with Zhang and Wu (2009)'s study on global strategies (*M*=3.63, *N*=249); students from the two studies demonstrated similar metacognitive awareness of problem-solving strategies, *M*=3.68 and *M*=3.78.

The reasons underlying this phenomenon were worthy of discussion. One possible assumption may be the difference in teaching practice/strategies in the two studies. In this study, teachers may introduce or practice certain global strategies without introducing them to the class, thus the students were not clear about applying global strategies in actual reading comprehension. However, in the study of Zhang and Wu (2009), some global strategies items may be instructed explicitly in the classroom so that students have a higher metacognitive awareness of global strategies than the students in the present study.

Additionally, teachers' instruction on teaching grammar, vocabulary, sentence structures and contexts clues regarding English reading were also believed to have an impact on students' metacognitive awareness of using strategies (Zhang & Wu, 2009).

However, without explicit and systematic training on reading strategies, students cannot acquire the strategies automatically. The students from the two studies both demonstrated high metacognitive awareness on problem-solving strategies possibly indicating that high school students were familiar with taking actions when encountering reading difficulties through frequent reading practices. However, it was the global strategies that needed to be taught explicitly by the teachers in the classroom so that students will be more aware of applying global strategies to facilitate English reading comprehension.

4.3 Findings in Three English Proficiency Groups

The previous analysis demonstrated the overall levels of metacognitive awareness of reading strategies among the students in Qiqihaer high school, China, and the results reveal a moderate metacognitive awareness level. In this section, the analysis will continue to examine the students' level of metacognitive awareness of reading strategies according to their English proficiency level.

In terms of the second research question, "What are the differences among low-, intermediate-, and high-proficiency students' levels of metacognitive awareness of reading strategies?", Table 4.4 presents the means and standard deviations of the low, intermediate and high proficiency students' levels of metacognitive awareness of reading strategies.

Evidently, the results showed that students from high English proficiency group

reported considerably higher metacognitive awareness in global (*M*=3.6) and problem-solving strategies (*M*=3.7) compared with the students from low and intermediate proficiency group. All of the three groups demonstrated the highest metacognitive awareness in problem-solving strategies, followed by global and support strategies. Slight differences were found in terms of the standard deviation of the three groups, which indicated that the scores given by all the students clustered closely around the mean. In this case, the means of the three proficiency groups were all representative of the scores given by the students.

Table 4.4: Means (*M*) and standard deviations (SD) of the three groups (*N*=118)

Name	Strategy	Low (*n*=34)		Intermediate(*n*=49)		High (*n*=35)	
		M	S.D.	*M*	S.D.	*M*	S.D.
GS1	Setting purpose for reading	2.4	1.1	3.1	1.2	3.7	1.1
GS2	Checking how text content fits purpose	2.3	1.0	2.7	1.2	2.9	1.3
GS3	Previewing text before reading	2.8	1.2	3.0	1.1	3.7	1.3
GS4	Determining what to read and what to ignore	2.5	.99	2.9	1.1	3.4	1.2
GS5	Using prior knowledge to help reading	3.3	.94	3.9	1.1	4.2	.90
GS6	Using text features (e.g. figures) to facilitate reading	3.3	1.1	3.7	1.2	3.8	1.1
GS7	Using context clues	3.0	1.2	3.9	.92	4.2	.63
GS8	Using typographical aids (e.g. bold face)	2.9	1.3	3.6	1.3	3.8	1.1
GS9	Checking understanding when come across new information	2.9	1.2	2.9	1.0	3.5	1.1
GS10	Guessing text meanings	3.4	1.1	3.8	1.0	3.9	1.1
GS11	Checking guessing or predictions	2.5	1.1	3.3	1.1	3.6	1.2
GS12	Critically analyzing the information resented in the text	2.3	1.2	2.3	.97	2.5	1.1
PS1	Reading slowly and carefully	3.2	1.2	3.4	1.0	3.5	1.0
PS2	Adjusting reading speed	3.3	.99	3.5	.96	3.9	.95
PS3	Pausing and thinking about reading	3.2	1.3	3.2	.98	3.6	1.1
PS4	Picturing or visualizing information read	2.8	1.2	3.2	1.1	3.0	1.3
PS5	Re-reading for better understanding	2.9	1.1	3.5	1.1	3.9	1.3
PS6	Guessing meaning of unknown words	3.3	1.1	3.7	.74	3.9	.87
PS7	Trying to concentrate on reading	3.4	1.2	3.6	.97	3.9	1.0

SS1	Taking notes while reading	2.5	1.0	2.7	1.4	3.0	1.3
SS2	Underlining information in text	2.9	1.1	3.4	1.2	3.1	1.3
SS3	Reading aloud when text becomes hard	2.0	1.2	2.3	1.2	2.6	1.4
SS4	Using reference materials	2.6	.95	2.9	1.0	2.6	1.1
SS5	Paraphrasing for better understanding	2.3	1.1	2.8	1.1	3.1	1.2
SS6	Going back and forth in text	3.2	1.2	3.4	.91	3.6	1.2
SS7	Asking oneself questions	1.7	.94	2.0	1.0	2.0	.98
SS8	Translating from English to native language while reading	2.6	1.3	2.6	1.0	2.4	1.2
SS9	Thinking in both English and native language while reading	3.1	1.1	3.3	1.0	3.7	1.2
GLOB	**Global Strategies**	**2.8**	**1.1**	**3.3**	**1.1**	**3.6**	**1.1**
PROB	**Problem-solving Strategies**	**3.2**	**1.2**	**3.4**	**1.0**	**3.7**	**1.1**
SUP	**Support Strategies**	**2.5**	**1.1**	**2.8**	**1.1**	**2.9**	**1.2**
ORS	**Overall Reading Strategies**	**2.8**	**1.1**	**3.2**	**1.1**	**3.4**	**1.1**

After comparing the means of metacognitive awareness of reading strategies among the three proficiency groups, in order to replenish the results, further investigation was conducted to see whether or not the categorizing of metacognitive awareness of reading strategies and the grouping of three proficiency levels have a significant impact on the students' report of metacognitive awareness levels. Therefore, a two-factor ANOVA with repeated measures test was applied. The dependent variable (DV) was the level of metacognitive awareness of reading strategies from 1 to 5. The two independent variables (IV) are: the frequency use of the three categories of reading strategies (GLOB, PROB and SUP) is set as the within-subject and the between-subject factor is the learners' proficiency level (low, intermediate, high).

The ANOVA test showed that, firstly, the main effect for the frequency of the three strategy categories (IV_i) was F (2, 115) = 73.37, $p<0.05$, revealing a significant effect on the students' levels of metacognitive awareness (DV); the main effect for the three groups of English proficiency (IV_{ii}) was F (2, 115) = 12.37, $p<0.05$, also showing a significant effect

on the DV. Secondly, the main effect for the interaction between the frequency of the three strategy categories (IV_i) and the three groups of English proficiency (IV_{ii}) on the students' levels of metacognitive awareness (DV) were found to be not significant, F (4, 115) = 2.35, $p>0.05$, revealing that the interaction effect of IV_i and IV_{ii} did not present a significant on the students' report of levels of metacognitive awareness.

After the ANOVA test, a correlation analysis through SPSS was conducted to further examine the relationship between students' metacognitive awareness reflected by individual item of SORS questionnaire and their English proficiency levels. The DV is the means of individual item of SORS questionnaire reported by each participant and the IV is the level of their English proficiency.

The results showed 13 out of 28 SORS items in Table 4.5 showed a relatively positive correlation to students' English proficiency, with the correlation coefficient (r) ranging from 0.243 to 0.540, $p< 0.01$. Among the 13 items, seven (54%) belonged to the global strategy category, four (31%) from the problem-solving strategy category, and two (15%) comes from the support strategy category.

Among the seven global strategies, item 1 (GS1) "setting purpose for reading" (r=0.386, p<0.01), Item 7 (GS7) "using context clues" (r=0.540, p<0.01) and item 11 (GS11) "checking guessing or predictions" (r=0.424, p<0.01) revealed a strong positive correlation with students' English proficiency level, which corresponded the previous results that students with higher English proficiency level tended to show a higher metacognitive

awareness level of global strategies. Among the problem-solving strategies, item 17 (PS5) "re-reading for better understanding" (r=0.400, p<0.01) indicated a strong positive correlation with students' English proficiency level. In addition, item 27 (SS8) "translating from English to native language while reading" (r=-0.004. p=0.970) showed a negative correlation between students' metacognitive awareness and their English proficiency level. Besides, item 23 (SS4) "using reference materials" (r=0.091, p=0.329) and item 26 (SS7) "asking oneself questions" (r=0.080, p=0.390) showed a weak correlation with students' English proficiency level, which also met with the previous finding that students with higher English proficiency level reported lower metacognitive awareness levels on support strategies.

Table 4.5: Result of the Pearson correlation analysis

Name	Strategy	Correlation Coefficient (r)	Significance (p)
GS1	Setting purpose for reading	.386**	.000
GS2	Checking how text content fits purpose	.197*	.032
GS3	Previewing text before reading	.318**	.000
GS4	Determining what to read and what to ignore	.299**	.001
GS5	Using prior knowledge to help reading	.396**	.000
GS6	Using text features (e.g. figures) to facilitate reading	.216*	.019
GS7	Using context clues	.540**	.000
GS8	Using typographical aids (e.g. bold face)	.292**	.001
GS9	Checking understanding when come across new information	.221*	.016
GS10	Guessing text meanings	.162	.080
GS11	Checking guessing or predictions	.424**	.000
GS12	Critically analyzing the information resented in the text	.152	.099
PS1	Reading slowly and carefully	.140	.130
PS2	Adjusting reading speed	.296**	.001

PS3	Pausing and thinking about reading	.142	.125
PS4	Picturing or visualizing information read	.126	.174
PS5	Re-reading for better understanding	.400**	.000
PS6	Guessing meaning of unknown words	.279**	.002
PS7	Trying to concentrate on reading	.323**	.000
SS1	Taking notes while reading	.121	.193
SS2	Underlining information in text	.212*	.021
SS3	Reading aloud when text becomes hard	.193*	.036
SS4	Using reference materials	.091	.329
SS5	Paraphrasing for better understanding	.272**	.003
SS6	Going back and forth in text	.187*	.042
SS7	Asking oneself questions	.080	.390
SS8	Translating from English to native language while reading	-.004	.970
SS9	Thinking in both English and native language while reading	.243**	.008

**Correlation is significant at the .05 level*
***Correlation is significant at the .01 level*

In the above section, the correlation test revealed a positive relationship between 13 SORS items and the students' English proficiency levels, among which global strategies accounted for 54%. This result was consistent with the findings of the previous studies (Huang, 2004; Huang, 2008, Wu, 2007; Zhang, 2002; Zhang & Wu, 2009). In other words, students with higher English proficiency level tended to report a higher level of metacognitive awareness of reading strategies and tended to use more global strategies, which suggested that the students' English proficiency or English abilities played a role in students' metacognitive awareness of reading strategies.

In general, from the above findings and discussion, we can conclude that the important role of global strategies should be taken seriously in teaching English reading comprehension in the Chinese high school's English classroom. By grasping the global

strategies, students' decoding skills of interpreting English short essays or even more complicated reading materials can be developed, which also increased their confidence towards learning English and better prepared them for academic English reading in the future. Besides, since students with higher English proficiency level tended to report a higher level of metacognitive awareness of reading strategies and tended to use more global strategies, it was believed that high school students' general English proficiency level can be improved if they were more aware of applying global strategies and transfer this strategy to other English skills.

4.4 The Relationship between Metacognitive Awareness of Reading Strategies and Reading Performance

In this section, the results regarding the third research question raised in Chapter 1 are presented and discussed. The research question is "What is the relationship between students' metacognitive awareness of reading strategies and their actual reading performance?" To answer this research question, the descriptive statistics of students' reading scores and the relationship between students' English proficiency levels and their reading performance are presented first.

In order to find out what relationship exists between students' metacognitive awareness of reading strategies and students' reading performance, the descriptive statistics of students' English reading performance are presented in Table 4.6 and Table

4.7. As illustrated in Chapter 3, the reading performance exam includes two parts accounting for 40 marks. The results as shown in Table 4.6 and Table 4.7 revealed that the mean of students' reading scores was 28.10, which indicated an intermediate English reading proficiency level. The standard deviation was 6.39 indicating a relative variability in student's reading scores. The results as illustrated in Table 4.8 showed that the mean of students' metacognitive awareness of reading strategies was 3.14 on a five-point scale, revealing a moderate level. The standard deviation was 0.62 showing a relatively less variation in overall metacognitive awareness level among the students.

Table 4.6: Descriptive statistics of students' reading scores (*N*=118)

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

Table 4.7: Frequency of students' reading scores (*N*=118)

Reading Scores	**Frequency**	**Percent (%)**
4.00	1	.8
6.00	2	1.7
8.00	2	1.7
14.00	1	.8
18.00	1	.8
20.00	7	5.9
22.00	6	5.1
24.00	6	5.1
26.00	9	7.6
28.00	13	11.0
30.00	26	22.0
32.00	24	20.3
34.00	15	12.7
36.00	5	4.2

Total	118	100.0

Table 4.8: 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

As stated in the Statement of the Problem in Chapter 1, most of the previous studies have verified that there was a relationship between students' metacognitive awareness levels of reading strategies and their English proficiency levels, but only few of them have examined the students' metacognitive awareness levels of reading strategies with their actual reading performance, which this study explored further.

In the previous section 4.2 and 4.3, the important role of students' English proficiency levels on their metacognitive awareness of reading strategies was testified. In order to know the relationship between students' metacognitive awareness levels of reading strategies and their actual reading performance, we need to first investigate whether students' with higher English proficiency level also scored higher in the reading performance test. Therefore, a correlation analysis was conducted to examine the relationship between students' English proficiency and their actual reading performance, as seen in Table 4.9.

Table 4.9: Correlation analysis between reading performance and English proficiency

Correlations			
		Reading performance (reading scores)	English proficiency
Reading performance (reading scores)	Pearson Correlation	1	.690**
	Sig. (2-tailed)		.000
	N	118	118
English proficiency	Pearson Correlation	.690**	1
	Sig. (2-tailed)	.000	
	N	118	118
**. Correlation is significant at the 0.01 level (2-tailed).			

The results revealed that there was a strong positive correlation between students' English proficiency and their reading performance (r=.690, p<.01), indicating that students with higher English proficiency levels also scored higher in the reading performance test. This strong correlation revealed that there was a need to further investigate students' metacognitive awareness of reading strategies with their actual reading performance instead of their general English proficiency level.

Therefore, a bivariate regression test was run to investigate the relationship between the students' overall levels of metacognitive awareness of reading strategies and their actual English 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 independent or predicted variable, while the students' reading performance scores were set up as dependent or outcome variable.

Table 4.10: 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			
a. Dependent Variable: reading scores b. Predictors: (Constant), Average					

The results showed 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 concise, 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, students' levels of metacognitive awareness of reading strategies as measured by SORS were considered having a big effect on students' English reading performance.

The above results extended the scope of Zhang and Wu (2009)'s study by exploring the relationship between metacognitive awareness and reading performance with real and abundant empirical data. The study also further verified the role of SORS questionnaire

as a reliable and measurable instrument of eliciting data from L2 learners and of assessing their metacognitive awareness level. In addition, the results provided the evidence that metacognitive awareness is a significant factor which contributed to the variance in English reading performance. Therefore, it is not presumptuous to predict the critical role of metacognitive awareness that played in other language learning realm (Veenman et al., 2006).

Besides, the above results are found to be consistent with Hou (2013)'s study that there is a significant relationship between students' metacognitive awareness and their actual reading performance through bivariate regression analysis. However, the participants in Hou (2013)'s study involved EFL college students from Taiwan, who had different English reading experience and English proficiency level from the high school students in this study. For example, a total of 454 junior university students from different faculties were involved in Hou (2013)'s study, while 118 high school students participated in this study. Therefore, more studies investigating the similar background (Chinese high school) with the present study are called for to compare the results and discuss the generalizability.

Moreover, the results also show the possibility that Chinese high school students' reading performance can be improved if their metacognitive awareness of reading strategies can be instructed in the English reading classroom. In Huang (2004)'s empirical study, Chinese university students' reading performance has been proven to have a positive relationship with the explicit instruction on metacognitive awareness of reading

strategies. The results were also consistent with the recent study of Shang and Zhang (2015) that the increase of EFL Chinese college students' metacognitive awareness of reading strategies played a positive role on improving their reading scores, which provided the idea that English teachers should be aware of increasing students' metacognitive awareness of reading strategies and appropriate curriculum should be designed to meet this demand.

However, no studies have been carried out to investigate this aspect on Chinese EFL high school students so far. Therefore, future studies investigating Chinese high school students' metacognitive awareness of English reading strategies, especially its' relationship with students' actual reading performance are welcomed to corroborate the results of the present study.

Although the results showed that students who reported higher levels of metacognitive awareness also scored higher in reading performance, the average level of metacognitive awareness of reading strategies was 3.14 out of a total of 5 – a moderate level approaching "sometimes" or "partially agree". A clear response "Never" and "Always" labeled 1 and 5 respectively were the expected answer for students who were clear about the questionnaire and who were familiar with the reading strategies.

However, the neutral response indicated, to some extent, that students were not familiar with reading strategy knowledge. Although the researcher gave a brief introduction and explanation of the three categories of reading strategies in the

questionnaire beforehand, it was inevitable that some students failed to identify their thinking and reading process and clearly classifying their reading process into the three categories of SORS. According to the students' background information, it was their first time, however, to use a reading strategy questionnaire to evaluate and reexamine their own reading process and performance after the exam. This may explain the students' uncertainty in selecting appropriate answers to fully reflect their reading process since they were not familiar with the self-evaluating instrument.

Conclusively, the results supported the previous studies that there was a significant relationship between students' metacognitive awareness and actual reading performance. Although the average level of metacognitive awareness of reading strategies showed a moderate level, it did not counter the conclusion that metacognitive awareness of reading strategies contributed to the variance in reading performance. As suggested by Dabarera et al., (2014), metacognitive awareness of reading strategies can be increased through metacognitive instruction over a period of time, and the increases were also related to the improvement of reading performance. For the Chinese students, it will take even more time to instruct their metacognitive awareness of reading strategies because of the EFL learning environment (Zhang, 2002; Shang & Zhang, 2015).

Thus, it can be established that Chinese high school students' English reading performance can be gained either by promoting instructions on metacognitive awareness of reading strategies as a component of English reading curriculum or cultivating the students' habit in using SORS questionnaire as an efficient tool to monitor and evaluate

their own reading performance.

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

To answer – "How do the three aspects (global, problem-solving and support strategies) of the students' metacognitive awareness of reading strategies relate to their reading performance?", 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 exam.

Different from the previous bivariate regression test, 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. Thus, 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 are shown in Table 4.10 included R, R^2, adjusted R^2, standard error of the estimate, and the unstandardized regression coefficients (B).

The results of the multiple regression analysis showed that F (3,114) =11.6, $p<0.05$, which indicated that the overall multiple regression was statistically significant. To put it

differently, the three predictors combined together displayed a significant relationship with students' actual reading performance, which proved the same results with the previous bivariate regression test.

As can be seen in Table 4.11, the R^2=0.23 indicated that 23% of the total variability in reading performance was explained by global, problem-solving and support strategies of SORS. The effect size was R=0.48 which outstripped the suggested medium effect size (R=0.30) and approached the value for a big effect (R=0.50).

Table 4.11: 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
a. Dependent Variable: scores of reading exam						

The results of the relationship between individual factors and reading performance scores revealed that among the three categories of metacognitive awareness of reading strategies, global strategy was a significant predicator (p=0.002) of the scores of reading performance compared with the other two categories. The unstandardized coefficient of global strategy (B=3.166) predicted that for one score increased in the metacognitive

awareness of global strategy, students' scores of reading exam will increase by 3.12 scores holding problem-solving and support strategies fixed.

In contrast, problem-solving and support strategies failed 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 was *B*=1.64, which was slightly bigger than the unstandardized coefficient value of problem-solving strategy (*B*=1.12), indicating that support strategy had a slightly better predictive ability for students' reading performance than problem-solving strategy.

Therefore, it can be concluded that among the three categories of SORS, global strategy was considered the most important predictor of students' actual reading performance, followed by support strategy and problem-solving strategy. Further inference can be made that students who performed better or scored higher in the English reading exam in this study showed 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.

The results of the above multiple regression analysis revealed that global strategy was considered the most vital predictor of students' English reading performance, which was different from the result of Hou (2013)'s study which found that problem-solving

strategy contributed the most in explaining students' English reading performance. This may cause by the differences in the participants who are involved in the two studies. It should be mentioned that in Hou (2013)'s study, the subjects consisted of 490 tertiary students from different disciplines, thus, the reading instructions, reading requirements and the structure of the reading exam in Hou (2013)'s study were different from the present study. As a result, the participants' perception of using English reading strategies in the two studies differed in that successful readers from high school level tended to apply global strategy whereas successful readers from university level preferred to utilize problem-solving strategy. However, more studies are needed to further corroborate this finding.

In order to explore further the differences in the levels of the three aspects of metacognitive awareness of reading strategies for successful readers and unsuccessful readers, the researcher divided the 118 participants into two groups based on their reading scores. Referring to the selection standard provided in Chapter 3, students who scored higher than 30 marks were considered successful readers, students who scored lower than 30 marks belonged to the unsuccessful readers.

As shown in Table 4.12, compared with the unsuccessful readers, successful readers reported higher metacognitive awareness levels on global strategies (M=3.4). 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. And students' who would like to "anticipate content" (same as GS11), "guessing text meanings" (same as GS10), and "question the author" (same as GS12) were considered successful English readers.

Table 4.12: 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	Analyzing and evaluating the information resented 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	1.00
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

GLOB	**Global Strategies**	**3.4**	**1.1**	**2.9**	**1.1**
PROB	**Problem-solving Strategies**	**3.6**	**1.0**	**3.3**	**1.1**
SUP	**Support Strategies**	**2.9**	**1.1**	**2.6**	**1.1**
ORS	**Overall Reading Strategies**	**3.3**	**1.1**	**2.9**	**1.1**

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 not as students who are being assessed by the reading exam. Therefore, successful readers were better at criticizing the reading passage and will not be daunted by the authority of the texts in the reading exam.

The application of the second group of strategies – problem-solving strategies – was noteworthy, although it failed to act as a significant predictor of reading performance in the multiple regression test. It was pertinent to notice in Table 4.12 that successful readers' average mean of problem-solving strategy (M=3.6) was higher than unsuccessful readers' average mean (M=3.3). Moreover, successful readers reported the highest average metacognitive awareness level in problem-solving strategy among the three categories. Therefore, the positive role of problem-solving strategy in explaining the variance of students' actual reading performance is overt.

Problem-solving strategies were those executive strategies that readers utilized to directly deal with the reading materials. To put it differently, problem-solving strategies involved the specific cognitive actions that readers take when they encountered reading obstacles, such as adjusting reading speed from slow to fast or fast to slow when the reading text was easy or difficult, re-reading the text when it became difficult and guessing the meaning of unknown words or phrases during reading.

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. However, several distinct statistics were found in successful readers and unsuccessful readers that they showed the highest metacognitive awareness on "going back and forth in text" among the support strategies. Both 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 content.

Besides, successful readers also reported higher metacognitive awareness on "thinking in both English and native language while reading". It seems that students' thinking in native language did not interfere with their L2 (English) reading instead help them increase the accuracy of reading comprehension. Other support strategies such as "taking notes while reading", "asking oneself questions", "reading aloud when text becomes hard", "using reference materials" and "paraphrasing for better understanding"

fall in a moderate metacognitive awareness level in both groups. It is possible that since the reading exam had a time limit, students tended to be too focused on answering all the questions and ignored these strategies since these strategies can be time-consuming.

4.6 Summary

In this chapter, the main research findings are illustrated based on the four research questions raised in Chapter 1. The findings showed that firstly students' overall metacognitive awareness of reading strategies was at a moderate level with the highest level falling on problem-solving strategies, followed by global strategies and support strategies.

Secondly, students from high English proficiency group reported considerably higher metacognitive awareness in global and problem-solving strategies compared with the students from low and intermediate proficiency groups. Thirdly, the metacognitive awareness of reading strategies as measured by SORS was positively related to students' actual reading performance, accounting for 23% of the variance in English reading performance. Fourthly, global strategy was a significant predictor of reading performance, while problem-solving and support strategies fail to demonstrate a significant relationship with reading performance. The next chapter presents the summary of the study, the implication, limitations and future recommendation of the study.

CHPATER 5

CONCLUSION

5.1 Summary of the Study

This paper reports an investigation on 118 Chinese EFL high school students' metacognitive awareness of reading strategies. Data are collected through the Survey of Reading Strategies (SORS) and one internal reading exam.

The findings showed that students' overall metacognitive awareness of reading strategies was at a moderate level with the highest level falling on problem-solving strategies, followed by global strategies and support strategies. Students from high English proficiency group reported considerably higher metacognitive awareness in global and problem-solving strategies compared with the students from low and intermediate proficiency groups. This provided the evidence that readers' metacognitive awareness of reading strategies were related to their English language proficiency.

Further investigation revealed that the metacognitive awareness of reading strategies as measured by SORS was positively related to students' actual reading performance, accounting for 23% of the variance in English reading performance. Analysis of individual factors showed that global strategy was a significant predictor of reading performance, while problem-solving and support strategies failed to demonstrate a significant relationship with reading performance. Besides, successful readers reported

higher levels of metacognitive awareness of reading strategies compared with the unsuccessful readers, which also verified the above multiple regression test.

5.2 Implications of the Study

Basically, there are three major implications of this research. Firstly, this study shows that, methodologically, the SORS questionnaire is an efficient method for English reading instructors to assess readers' metacognitive awareness of reading strategies, so that they can better interpret readers' learning needs and design suitable strategy-based reading curriculums to help L2 readers read more effectively. As pointed out by Matsumoto (1993), questionnaire is a reasonable method to facilitate learners to introspect their own learning process. In this aspect, this study proves that L2 readers' metacognitive awareness can be investigated through a valid questionnaire.

Secondly, this study contributes to the current teaching of English reading in China. As pointed out by Dabarera, Renandya, and Zhang (2014), students' metacognitive awareness of reading strategies can be improved by metacognitive scaffolding and instruction. Therefore, Chinese high school teachers should begin to notice the important role of metacognitive awareness instruction in the teaching of English reading in the classrooms by using the SORS questionnaire as a main instrument to guide and elicit students' metacognitive awareness of reading strategies.

Besides, since the result reveals that global strategy is a significant predictor of reading performance, it is strongly believed that the Chinese students' English reading performance can be improved if their metacognitive awareness of using global strategies can be enhanced. Thus, enough instructions on global strategies are suggested in the Chinese English reading classroom.

Moreover, the SORS questionnaire can be a simple and effective checklist for Chinese high school students to introspect on their own reading process. Once they reflect on this questionnaire, they can begin to concentrate on applying certain reading strategies so that their awareness of applying different reading strategies can be improved gradually. Besides using the SORS questionnaire in the classroom, the students can also use it as a checklist for monitoring their reading process while reading outside the classroom. It is believed that the SORS items can be an important tool for Chinese students to enhance their metacognitive awareness towards English reading.

Lastly, theoretically, this study expands the scope of metacognitive awareness and L2 reading by examining the relationship between L2 readers' metacognitive awareness of reading strategies and their real reading performance. It recommends a possible way for future studies to combine questionnaire results and real test results in order to have a clear recognition of L2 readers' metacognitive awareness in the field of L2 reading research.

5.3 Future Recommendations of the Study

There are several recommendations to improve the current research. First of all, future studies are recommended to increase the sample and are encouraged to conduct the research in other provinces of China so that a broad picture of Chinese EFL high school students' metacognitive awareness of reading strategies can be captured. Besides, cross-cultural researches are welcomed to compare and contrast the results with the present study.

Secondly, future studies are called for to enlarge the scope of the research by incorporating other factors such as motivation, gender, psychological types, stored vocabulary knowledge, cognitive styles, learning preferences, and intelligence, which might contribute to the anticipation of actual reading performance, with metacognitive awareness of reading strategies.

Thirdly, the research instruments can also be enriched in the future studies. If time permits, researchers are recommended to combine the metacognitive awareness questionnaire with real classroom observation and teachers' feedback to enrich the research findings. Besides, instead of using just the SORS questionnaire, other instruments such as think-aloud protocols or interviews are also recommended for future studies in order to complement the questionnaire findings and to elicit L2 readers' actual use of reading strategies.

Furthermore, future researches are recommended to apply different reading tests or tasks with different reading purposes and genres to elicit students' perceptions and awareness of using reading strategies. Only by doing this, L2 readers' use of reading strategies towards different reading tasks can be compared and discussed, and there may be a chance to improve the existing scope of the SORS questionnaire.

Finally, future studies are strongly encouraged to apply the findings of this study into actual English reading classroom practices. Curriculum designers and teachers can test out whether students' reading performance can be improved through the instruction on metacognitive awareness of reading strategies and the using of SORS questionnaire. Thus, more suitable English reading curriculum, reading materials and classroom reading activities can be carried out to meet with students' actual learning needs.

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