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Research Article

Influence of L1 Metacognitive Reading Strategies on L2 Academic Reading of Chinese College Students

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Abstract

With the fast increasing number of second language (L2) learners in universities, the ability to read L2 academic texts has become one of the most important skills that L2 college students need to acquire. However, L2 learners still face various problems and difficulties in their L2 reading and past literature suggests that reading strategies have proven to be effective in enhancing L2 reading. Therefore, it is of great significance to examine the factors influencing L2 reading strategies use. Among factors influencing L2 reading strategy use, L1 reading strategies have been identified as a significant influence. However, few studies in this regard have looked into college students in mainland China which has a large number of L2 learners. This study aimed to seek the connection between first language (L1) and L2 metacognitive reading strategies by comparing and contrasting mainland China college students' metacognitive strategy patterns in their L1 and L2 academic reading. The study also explored factors influencing Chinese college students' L2 reading strategy use. The study conducted a survey on reading strategies (SORS), think aloud protocol (TAP) and stimulated recall interviews (SRI) to explore the research issues. The study found that Chinese college students employed strategies on a more frequent basis in their L2 academic reading as compared to their L1 academic reading. Two factors, namely, limited L2 proficiency (LLP) and test-oriented reading approach (TORA) were identified as the major factors influencing the L2 metacognitive strategy patterns of Chinese college students. The present study adds to the existing knowledge on the relationship between L1 and L2 reading strategy patterns for Chinese college students and examines factors shaping their L2 reading strategy use. This study assists English language teachers to identify factors influencing Chinese college students' reading strategies patterns while taking into consideration of the factors influencing their L2 strategy use.

Keywords: *metacognitive, reading strategies, academic reading, Chinese, students*

1. Introduction

Understanding academic texts is a required and important skill for college students all over the world. "Success in college depends to a considerable degree upon students' ability to engage in strategic reading of extensive academic or informational text" (Caverly, D. C et al, 2004). Students at college level also need to conduct extensive academic reading not only to write research paper

and prepare for tests(Caverly, D. C et al, 2004) , but also to keep up with the accelerated evolution of knowledge in all fields (Pugh and Antommarchi 2000). In this sense, the ability to read academic texts not only contributes to academic success, but also to later career development.

However, for first language (L1) readers, academic reading at college level is not an easy task (Ruzic, 2001). Both text characteristics and reader characteristics contribute to this phenomenon (Durwin and Sherman, 2008). On the one hand, academic reading texts at college level are complex in nature (Pugh and Antommarchi 2000). summarized several important features of college textbook including high conceptual density, comprehension of information, and use of special terminology. On the other hand, a large number of students enter college underprepared for academic reading demands, thus facing many problems in the process of academic reading (Moss and Bordelon, 2007). These text-initiated factors and reader-initiated factors make academic reading a complicated issue.

Among the various reading problems confronting L1 college students, a lot of them are reading strategy related in nature as reading strategies have an important role to play in understanding academic texts for they are considered as actions, plans or behaviors that facilitate readers' comprehension of reading information or help readers accomplish their reading tasks or goals (Anderson, 1991; Pritchard, 1990). Some strategy-related reading problems for L1 readers might include deficiency in information processing (Pressley et al, 1997), taking a surface approach to reading (Maaka and Ward, 2000), inability to reconstruct and elaborate on their assigned readings (Taylor et al., 1985). In light of this, effective reading strategy instruction for college students is essentially important (Caverly et al., 2004). In other words, it is of significance to help students realize their reading problems and specific reading strategies targeting at their problems.

L1 reading strategies also played a vital role in improving students' academic performance in various aspects. Past studies proved that training on the strategy of repeated readings had great facilitating effect on poor readers' recall of idea units (Mastropieri et al., 1999); certain strategies like previewing could help students to increase their reading fluency (Dole et al., 1991); strategies facilitate students' comprehension on increasingly sophisticated texts (Taraban et al., 2000); a positive and consistent relationship was also found between strategy use and students grade point average (GPA) (Levine et al., 2000). All these studies affirmed the positive role reading strategies play in academic reading.

With the fast increasing number of English as Foreign Language (EFL) learners and English as second language (ESL) learners in universities, the ability to read English academic texts has become one of the most important skills that EFL and ESL college students need to acquire (Kim, 1995). Like native English speakers, ESL and EFL readers face various difficulties and challenges in English reading. These problems include limited vocabulary (Moss and Bordelon, 2007); incomplete understanding on certain words and inability to cope with difficult syntactic structure (Zhang, 2001); lack of grammatical knowledge (Drucker, 2003); lack of understanding on cultural difference (Carrell et al., 1989). All these problems pose great challenge for ESL and EFL readers.

In helping EFL and ESL students to improve their English reading, L2 reading strategies, among other measures, have proven to be effective in enhancing second language reading (Dreyer and Nel, 2003). In fact, training on L2 reading strategies has led to increased overall reading ability (Aghaie and Zhang, 2012); increased reading performance and autonomous reading behavior (Tang, 1997). Many factors influence L2 reading strategies use. Among the many factors, perhaps the one found to exert a significant influence on L2 reading strategies is L1 reading strategies. For example, Taillefer and Pugh (1998) detected an interdependent relation between L1 and L2 reading strategies; Yau (2009) found similar pattern of L1 and L2 reading strategies for ESL readers. A strong link has also been detected between perceived L1 and L2 reading strategies (Harris and Grenfell, 2004).Thus, the issue of comparing reading strategies across L1 and L2 is of significance (Tang, 1997; Taillefer and Pugh, 1998) .

Metacognitive strategies are closely associated with the planning and managing activities taken in the process of reading. These activities are generally viewed as important contributors to improving reading comprehension outcomes in general (Davis and Bistodeau, 1993), facilitating reading (Kim, 1995), and enhancing text recalling and summarization (Levine et al., 2000). Therefore, an in-depth investigation into the use of metacognitive strategies in the current study

helps shed light on those useful planning and managing activities employed in Chinese college students' reading process. In addition, a detailed comparison on the pattern of those activities in their L1 and L2 academic reading also sheds light on the possible connection and influence of L1 metacognitive strategies on L2 academic reading for Chinese college students.

In spite of some studies on comparing L1 and L2 reading strategies, the extent of L1 reading strategies use in L2 reading and the types of L1 reading strategies being used varied in different studies (Zhang, 2001). Furthermore, researchers are still debating on the types of L1 reading strategies being used in L2 reading (Zhang and Cheng, 2008). In addition, few of the studies have been conducted on L1 reading strategies used by Chinese college students, in particular, college students studying in mainland China in their L2 reading. Mainland China has a large EFL learner population, and mainland Chinese college students are an important part of it. Given the fact that Chinese and English are drastically different languages in terms of orthography and ways of learning, more research are needed on the influence of mainland Chinese college students' L1 reading strategies on their L2 reading.

Therefore, this study aims to explore influence of L1 metacognitive reading strategies on L2 reading of academic texts by Chinese college students studying in mainland China. Findings of this study maybe used to propose an instructional program which may guide Chinese college students in utilizing effective L1 strategies in L2 reading by overcoming challenges influencing their strategy use in academic reading. The following research questions are addressed:

1. How do L1 metacognitive reading strategies influence L2 academic reading of Chinese college students?
2. What factors influence Chinese college students' metacognitive reading strategies in reading English academic texts?

2. Method

2.1 Participants

The participants for the survey of reading strategies (SORS) were from two medical universities in southern China. The selected university sets relatively high standards in the enrollment of their students who acquire basic proficiency in both Chinese and English. In order to control the effects of differences in background knowledge and pre-survey English proficiency, a background questionnaire was conducted to obtain information on the major, years of learning English, score on College English Test, band 4 (CET4). "The purpose of the CET is to examine the English proficiency of undergraduate students in China and ensure that Chinese undergraduate reach the required English levels specified in the National College English Teaching Syllabuses (NCETS)" (Sheorey and Mokhtari, 2001). According to NCETS (2006), students obtaining CET 4 have relatively strong ability in reading, intermediate ability in listening and basic ability in writing and speaking. Students with CET4 are able to use English as a means to obtain major-required knowledge.

Participants with same major, grade and CET4 score range were selected for SORS (detailed information on SORS is provided in section 3.3.1). Several students from those selected to participate SORS were selected for the TAP sessions stimulated recall interview (SRI) sessions.

2.2 Instruments

The instruments in the study include survey of reading strategies (SORS), think-aloud protocol (TAP), stimulated recall interview guide (SRIG) and academic reading texts.

2.2.1 SORS

The questionnaire used in this study is adapted from the survey of reading strategies (SORS) developed by Mokhtari and Reichard (2002) on its metacognitive section. The SORS was intended to measure the reading strategies for native and non-native English speakers at post-secondary level. The SORS was adapted from the metacognitve awareness of reading strategies inventory

(MARSI) developed by (Goodman, 1967). MARSI was based on a body of work on metacognition and reading comprehension by researchers like (Baker and Brown, 1984; Alexander, 2000) and drew on Pressley' (1995) notion of constructively responsive reading and validated with 825 students. The SORS has been pilot-tested on 147 ESL students studying in the United States and a 0.89 Cronbach's alpha in overall reliability indicated reasonable degree of consistency of the SORS (Mokhtari and Reichard, 2002). The SORS has also been widely used in a number of studies on reading strategies (Harris and Grenfell, 2004; Poole, 2005; Lin and Yu, 2013).

Several modifications were made by the researcher regarding the original metacognitive section from SORS: first, two metacognitive strategies: "Using text features (e.g. tables)" and "using typographical aids (e. g. italics)" were deleted as the academic texts selected for this study (academic texts from CET4 reading comprehension test) were without the above-mentioned text features and typographical aids. Second, the strategy 'evaluate what is read' and 'resolving conflicting information' were shifted from cognitive strategy category to metacognitive strategy category. The reason for this modification lied in the fact that "evaluation strategy" and 'checking one's understanding' were important parts of metacognitive strategies (Pressley, 2001; Iwai, 2011). The use of these two metacognitive strategies has also been noted by a number of researchers (Harris and Grenfell, 2004; Berkowitz and Cicchelli, 2004). Therefore, it was necessary to shift these two strategies to the metacognitive strategy category.

Thirdly, the strategy 'using context clues' was shifted from metacognitive strategy category to cognitive strategy category and combined with the strategy 'Guessing meaning of unknown words' into a new strategy 'inferencing'. The reason for this modification is that 'inferencing' is a cognitive strategy defined as "using available information to guess the meanings or usage of unfamiliar language items associated with a language task" (Chamot and Kupper, 1989). According to this definition, the strategy 'using context clue' and 'guessing meaning of unknown words' were overlapping to some extent and would lead to confusion. In addition, the notion of "inferencing as a cognitive strategy" was recognized by other researchers (Harris and Grenfell, 2004; Zheng and Cheng, 2008). Therefore, it was necessary to make the combination to avoid further misunderstanding and confusion.

2.2.2 TAP

Verbal reports have been frequently used as a data collection method to gain information on subjects' cognitive processes by probing their internal states (Ericsson and Simon, 2004). Verbal reports have also been extensively used as a data elicitation technique in second or foreign language research (Sheorey and Mokhtari, 2001). Lin and Yu (2001) summarized 5 major advantages of verbal reports: first, their difference from other methods of investing cognitive processes afforded them a valuable role in collecting converging data resources. Second, they provided direct and veridical descriptions of cognitive processes. Third, they allowed access to the reasoning processes underlying higher level cognitive activity. Fourth, retrospective reports were the only available means for historical or genetic analysis of mental processes under certain circumstances. Finally, verbal reports enabled an analysis on the affective components of reading processes. Thus, the features of verbal reports allowed for an in-depth investigation on the central issue of this study: reading strategies.

Think aloud (TA) method is one type of verbal reporting "in which the examiner provides a task and asks subjects to say aloud everything that comes to mind as they are performing it" (Tang, 1997). TA method is suitable in a variety of problem-solving studies as they provide rich verbal data about reasoning during a problem solving task (Dreyer and Nel, 2003). Think aloud protocol (TAP) which is "the expression of one's thoughts and the analysis of the resulting transcripts, or protocols" (Kucan and Beck, 1997) is believed to be consistent and complete as it provides direct verbalization of cognitive processes (Kim, 1995). A lot of studies have applied TAP analysis in exploring reading strategies employed by second language (L2) or foreign language (FL) readers (Yau, 2009; Mokhtari and Reichard, 2002; Alexander and Jetton, 2000). Thus, TAP was suitable for this study as it not only elicited detailed information on reading strategies employed in reading process, it also shed light on the influence of L1 reading strategies in L2 and challenges confronting participants in their L2 reading.

2.2.3 SRIG

Stimulated recall is defined as “a means by which a researcher, in an effort to explore a learner’s thought processes or strategies, can prompt the learner to recall and report thoughts that she or he had while performing a task or participating in an event” (Mackey and Gass, 2005). It also has the advantage of being intact (Yau, 2009), and the least reactive introspective methods (Baker and Brown, 1984; Poole, 2005). Due to the above-mentioned characteristics of SRIG, it has been extensively used in second language acquisition (SLA) research (Poole, 2005), especially in second language learners’ cognitive learning processes (Pressley, 2002; Lin and Yu, 2011) including learners’ strategy use (Baker and Brown, 1984; Mackey and Gass, 2005). In light of this, SRIGG was the appropriate instrument for the current study as it was one of the commonly used introspective methods which shed light on readers’ strategy use.

Another important advantage of SRIG is it helps researchers to uncover cognitive processes which cannot be easily observed (Mackey and Gass, 2005). In TAP, some types of reading strategies might not be revealed like metacognitive strategies with planning or evaluating nature (Lin and Yu, 2013). In addition, in some cases, proficient first language (L1) readers might not be fully aware of some of the L1 strategies they are automatically using (Sheorey and Mokhtari, 2001; Yau, 2009). Therefore, in this study, SRIGG served as a good complementary method to TAP as it provided additional information on reading strategies and other relevant information which cannot be easily observed.

2.2.4 Academic Text

This study was conducted in the context of academic reading and several principles guided the selection of academic texts used in the study. The first very important concern was that all the texts were expository in nature. The reason for this was that expository texts were important sources for information in students’ academic life and they are also the type of texts where second language (L2) academic readers are likely to encounter many problems. The second and also very critical principle was that the text in English and Chinese should shared similar rhetorical structure as texts with different rhetorical structure might affect the reading process (Blaker and Brown, 1984) and further affects the employment of reading strategies. The rhetorical structure type here referred to five basic text structure: description, sequence, causation, problem and solution, and comparison and contrast based on Meyer and Freedle’ (1984)’s definition. The third condition was that both texts share similar and appropriate length range. According to Dörnyei (2007) , “an academic text should be long enough to allow the subjects to become involved in reading, but not so long that they become fatigued by the demands of thinking aloud for extended periods” (Dörnyei,2007). The length range suggested by Dörnyei (2007) was within 300 to 1000 words. Therefore, based on the above-mentioned principles, the English academic texts were selected from CET4 reading comprehension tests and the Chinese academic texts were chosen from Chinese comprehension test in National College Entrance Exam (NCEE).

2.3 Research procedure

The actual study was conducted in the following steps: SORS and background questionnaire were delivered to the medical students in grade three from two medical schools in southern China. The SORS of 106 participants were selected for further analysis. The 106 participants meet all the requirements for participants in this study as listed in table 3.1 23 participants out of 106 were selected (11 from one medical school and 12 from another school) for TAP and SRIG sessions. The data collected from SORS, TAP and SRIG were analyzed.

2.3.1 Data analysis

First of all, descriptive statistics from SORS concerning the subjects’ usage frequency on each strategy in their L1 and L2 reading were obtained. After that, a paired-sample t test was employed

to obtain the mean score of each strategy across all three categories in participants' L1 and L2 reading to identify the general pattern of L1 and L2 reading strategies. The paired sampled t-test was also employed to compare the mean scores of each pair of reading strategy across all three categories in participants' L1 and L2 reading to compare and contrast their pattern of reading strategies e in L1 and L2 academic reading. The paired-sample t-test was chosen as it is suitable for comparing two sets of scores or variables obtained from the same group (Dörnyei, 2007).

The think-aloud protocols (TAP) analysis stage was carried out in the following steps: first, in the data preparing stage, all TAP were transcribed and translated immediately after the think-aloud task; second, in the data reducing stage, TAP were segmented into meaningful units and coded. In the data representation stage, analyzed data with assigning codes were represented in a table form.

3. Results and Discussions

3.1 Influence of L1 metacognitive strategies on L2 academic reading of Chinese college students

The influence of L1 metacognitive strategies in Chinese college students' L2 academic reading were mostly obvious in the extent of similar overall pattern of metacognitive strategies as six out of nine (67%) strategies fell in the same frequency range in L1 and L2 academic reading (high :mean of 3.5 or higher), medium :mean between 2.5 to 3.4 and low :mean of 2.4 or lower suggested by (Mokhtari and Reichard, 2002) The finding that Chinese college students shared similar overall medium usage of metacognitive strategies in both their L1 and L2 academic reading is also in line with previous studies of Mokhtari and Reichard (2002) who both found similar moderate overall metacognitive usage pattern in L1 and L2 academic reading. The similar overall usage pattern of some metacognitive strategies for Chinese college students in their L1 and L2 reading in the current study might be an indicator that higher-level, top-down strategies like some metacognitive strategies are not language-specific and readily shared in both L1 and L2 reading. Table 1 indicates the six metacognitive strategies with similar frequency range in Chinese college students' L1 and L2 academic reading.

Another similarity concerning the L1 and L2 metacognitive strategies employed by Chinese college students is represented in one particular metacognitive strategy, namely the strategy of "selecting reading content". Though the same strategy fell in different usage frequency level, they were quite close statistically as no statistical difference existed between them (P=0.237). The similar pattern on the employment of this particular strategy in both L1 and L2 academic reading might provide proof to Goodman (1967)'s psycholinguistic guessing game model of reading which believes that reading is rather a selective process which is composed of readers' prediction of reading passages, sampling reading passages and confirming predictions based on background knowledge and prior predictions on reading passages. Table 2 indicates the statistically similar metacognitive strategy.

Table 1: Metacognitive Strategies with Similar Frequency Range

MET	mean (L1)	mean (L2)	Usage Level
Setting Reading Purpose	3.54	4.14	High
Checking Understanding for Conflicting Information	3.39	3.49	Medium
Evaluating	3.08	2.58	Medium
Confirming Prediction	2.72	3.33	Medium
Preview	2.70	3.29	Medium
Checking Whether Reading Content Fits Reading Purpose	2.88	3.25	Medium

Note: MET=metacognitive strategy

Table 2: Statistically similar metacognitive strategy

MET	mean (L1)	mean (L2)	p-value
Selecting Reading Content	3.54	3.35	0.237

Note: P>0.05 means there is no statistically significant difference, MET=metacognitive strategy

3.2 Factors influencing Chinese college students' metacognitive strategy use in L2 academic reading

Two factors, namely TORA and LLP were identified in the current study as the major factors influencing Chinese college students' metacognitive reading strategies in their L2 academic reading.

3.2.1 TORA

TORA is a major factor which exerted a wide influence on nearly every single type of metacognitive strategy adopted by Chinese students in their L2 academic reading. Among all nine metacognitive strategies, eight of them were influenced by this factor to different extent. The reason why TORA exerts such great influence on Chinese college students' L2 reading is because solving test questions is widely considered as the top priority among them. Consequently, their whole L2 reading process from the pre-reading stage like 'setting a reading purpose', 'noting text features' to during-reading stage like 'checking whether reading content fits reading purpose', 'confirming predictions' were guided by this top priority .Table 3 presents an overview of the influence of TORA in this regard.

Table 3: The Influence of TORA on Metacognitve strategies

Metacognitive Strategy	**How it was influenced**
Setting reading purpose	to answer **test questions**
Noting text features	To estimate needed time for **test questions**
Confirming predictions	Confirm predictions related to **test questions**
Preview	To solve certain types of **test questions**
Checking whether reading content fits reading purpose	Focus on content related to **test questions**
Evaluating	Only use it if it is required by **test questions**
Selecting reading content	Focus on content related to **test questions**
Checking understanding for conflicting information	For conflicting options in **test questions**

3.2.2 LLP

Another factor which is LLP was identified to have a wide influence on the employment of metacognitive strategies for Chinese college students in their L2 academic reading. Five out of nine metacognitive strategies were influenced by the factor LLP. Of the five metacognitive strategies, two were frequently employed: 'predicting or guessing text meaning' (mean=3.89) and 'noting text feature' (mean=3.63) as participants need frequent predicting and guessing to compensate for their lack of understanding caused by LLP. Participants also frequently note text features such as text length to estimate the time needed for reading. The rest three strategies: 'check understanding for conflicting information', 'preview' and 'evaluate' were moderately employed (mean=3.49, 3.29 and 2.58 respectively) as students sometimes need to check their understanding on conflicting information caused by LLP, they also need to preview on some occasions to facilitate their understanding. Table 4 presents an overview on the influence of LLP in this regard.

Table 4: Influence of LLP on Metacognitive Strategy Use

Metcognitive Strategy	**How it was influenced**
Predicting or guessing text meaning	**Frequently adopted** to predict the meaning of unknown words
Noting text feature	**Frequently adopted** to note text length and estimate time needed for reading
Preview	**Moderately adopted** to facilitate understanding
Check understanding for conflicting information	**Moderately adopted** for conflicting information due to insufficient understanding
Evaluate	Rarely adopted due to insufficient understanding on the whole passage

4. Conclusions

The results of this study suggested a similar overall metacognitive strategy pattern in Chinese college students' L1 and L2 academic reading with six out of nine (67%) metacognitive strategies fell in the same usage frequency range in both L1 and L2 reading. On average, L2 metacognitive strategies were employed more frequently in L2 academic reading and two factors, TORA and LLP were identified as major factors contributing to L2 metacogntive strategy pattern among Chinese college students. The present study adds to the existing knowledge on the connection between L1 and L2 reading strategies among Chinese college students. It also examined the factors contributing to the pattern of L2 reading strategies employed by Chinese college students and assists English language teachers in identifying factors shaping their L2 reading strategy use.

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