L1 and L2 online reading strategy usage of advanced Chinese learners
(高级汉语学习者之母语与外语线上阅读策略使用)

Kuo, Yi-Lu
(郭依鹭)
Indiana University Bloomington
(印第安纳大学布鲁明顿分校)
yikuo@umail.iu.edu

Yu, Pei-Shan
(余佩珊)
Indiana University Bloomington
(印第安纳大学布鲁明顿分校)
peiyu@umail.iu.edu

Abstract: This study examined and compared online reading strategies of advanced CFL learners (N=17) in English and Chinese using data from Online Survey of Reading Strategies (OSORS), think-aloud protocols, and follow-up interviews (Oxford & Crookall, 1989). Online reading strategies have three main categories: Global Reading Strategies (GRS), Problem Solving Strategies (PSS), and Support Reading Strategies (SRS). The results showed that participants used PSS more frequently than GRS and SRS. In addition, participants' use of GRS had significantly more than SRS in English. Their use of SRS in Chinese had significantly more than in English. Furthermore, among the PRS, participants distinguished between fact and opinion, and looked for both sides of an issue significantly more in English. Among the SRS, participants printed out a hard copy and underlined information, and used reference materials significantly more in Chinese contexts than in English contexts. The data from think-aloud protocols and interviews reinforced OSORS results.

摘要: 本研究探讨十七名高级汉语学习者的线上汉语与英语的阅读策略使用。本研究的研究方法为线上阅读策略使用问卷、有声思维法和访谈方式。线上阅读策略分为三大类: 全盘阅读策略、问题解决策略及辅助策略。研究结果显示受试者使用问题解决策略的频率比全盘阅读策略及辅助策略的频率高。此外, 受试者的汉语辅助策略使用频率多于英语辅助策略使用。此三大类阅读策略在汉语与英语的使用情境下也将详细探讨。

Keywords: Online Reading Strategies, Global Strategies, Problem Solving Strategies, Support Strategies

关键词: 线上阅读策略，全盘策略，问题解决策略，辅助策略

1. Introduction

With the rapid development of technology, the internet has tended to be easier to obtain, allowing people to communicate regardless of the time and place. According to Uso-Juan & Ruiz-Madrid (2009), online reading has become an issue for discussion in the educational field and more particularly in English as a second or foreign language. While some studies have focused on online reading in English and other languages (Anderson, 2003; Tanyeli, 2008; Uso-Juan & Ruiz-Madrid, 2009), there are relatively fewer studies on Chinese online reading comprehension. Specifically, the online reading process of CFL (learning Chinese as a foreign language) readers is an important unexplored area in online reading research.

Due to the different structures of the logographic and alphabetic language system, there is a debate on the similarities and differences between reading English and Chinese. Chinese characters are composed of morphemes, while alphabetic words are composed of phonemes. Researchers have different perspectives on phonological awareness when readers decode English and Chinese words (Lau & Chan, 2003). Owing to the differences between English and Chinese linguistic structure, there may be limitations and differences between the way students read English and Chinese online. In addition, previous studies (Anderson 2003; Uzunboylu, 2005; Tanyeli, 2008) indicate that online English reading has positive effects on readers' learning motivation, academic achievement and reading skills, we wonder if these results will be applied to CFL learners. Therefore, the research questions of the current study are as follows:

a. What online reading strategies do CFL learners use in learning Chinese?
b. What are the differences of online reading strategies that CFL learners use in L1 and L2?

Exploring the presence of strategies use on online Chinese reading comprehension will enrich our understanding of the reading process of CFL readers. Addressing these questions also help teachers for developing new approaches in online reading instruction.

2. Literature review

2.1 Positive effects of online reading

Due to the multiple visual and audio functions in the online learning environment, online learning has increasingly become popular for teachers and learners. There are more and more texts such as online newspapers, journals, and magazines now processed on screen. Thus, EFL learners' use of strategies in printed text and online reading contexts was analyzed by Uso-Juan & Ruiz-Madrid's (2009) study. The study examined the effect of the online text on EFL learners' reading comprehension and their use of online reading strategies. Results of this study revealed that learners who read on screen employed more reading strategies than learners who read in printed text. In addition, 68%

of students stated that the online links are helpful for them to achieve better text comprehension purposes, because online links are organized in a semantic network in which numerous related passages are connected by keyword links. Results of this study might be used to compare the EFL learners and the CFL learners, who are the participants in our study.

2.2 Assessment

Mokhtari and Sheorey (2002) adopted a Survey of Reading Strategies (SORS) which was intended to measure adolescent and adult ESL students' metacognitive awareness and perceived use of reading strategies while reading academic materials. This SORS included three main types of strategies, that is, Global Reading Strategies (GRS), Problem Solving Strategies (PSS), and Support Reading Strategies (SRS). GRS are those intentional, carefully planned techniques by which learners monitor or manage their reading, such as having a purpose in mind, previewing the text as to its length and organization or using typographical aids and tables and figures. PSS are the actions and procedures that readers use while working directly with the text, such as adjusting the speed of reading when the material becomes difficult, guessing the meaning of unknown words and rereading the text to improve comprehension. SRS are the basic support mechanisms intended to aid the reader in comprehending the text such as using a dictionary, taking notes, underlying or highlighting textual information.

Many follow-up studies (Anderson, 2003; Pookcharoen, 2009) then used SORS to adapt Online Survey of Reading Strategies (OSORS) to examine their ESL and EFL students' different use of metacognitive online reading strategies. Anderson (2003) analyzed the ESL/EFL learners' mental process while reading an online text in order to provide learners better training in online reading tasks. He investigated different types of online reading strategies used by second language learners. Particularly, he observed the differences between ESL and EFL learners in their choice of reading strategies. The OSORS were conducted after participants were engaged in numerous online reading tasks. Results of this study reported that ESL and EFL learners demonstrated no differences in the use of GRS and SRS. The study did find, however, that EFL learners were more frequently used PSS during the online reading process. The study concluded that the similarities between the ESL and EFL learners were due to EFL learners had opportunities to be exposed to English through various media such as internet, television and radio. However, no studies so far have investigated other language learners' online reading strategies through this survey. Therefore, this study will expand its current use to Chinese reading strategies.

Tercanlioglu (2004) investigated the English reading strategies of 11 postgraduate EFL students and 6 native English speaking British students. According to the result of SORS and interview in the study, both EFL students and L1 English native speakers showed a clear preference for PSS, followed by GRS and SRS. However, L1 students reported high and frequent use of GRS while ESL students reported more frequent use of SRS.

Besides OSORS, introspective think aloud protocol is also a commonly method used in conducting language learning research. Using think aloud protocol not only allows readers to describe what they are thinking during their reading process, but also enables them to explain how they use strategies (Oxford & Crookall, 1989). Although think aloud protocol provides a direct view of readers' mental activity, there are some limitations of using it. For instance, Block (1986) stated that it is informative about the reading processes when readers have problems understanding what they are reading; however, the processes are not easily verbalized, which may not be readily studied. Therefore, in addition to think aloud protocol, conducting oral interviews is another method for readers to retrospectively report what and how reading strategies they use during their reading process (Oxford & Crookall, 1989). The method of oral interview can further supplement the results of think aloud protocols.

3. Methods

3.1 Participants

The participants are 17 advanced Chinese learners at Indiana University. All of them have learned Chinese for three years in the US and have been to China during summer vacation. They will also have to study or do internship in Mainland China after their 4 year college education. Their Oral Proficiency Interview, Chinese Computerized Adaptive Listening Comprehension Test and Chinese Computer Adaptive Reading Test showed that their Chinese level ranges from Advanced-Low to High.

3.2 Instrument

OSORS. Adapted OSORS, which is applicable to Chinese learners, was used to examine participants' metacognitive online reading strategies while reading academic materials in Chinese (such as textbooks, journal articles, class notes, etc.). This adapted OSORS consists of 37 items, each of which uses a 5-point Likert scale ranging from 1 ("I never or almost never do this") to 5 ("I always or almost do this"). Participants were asked to read each statement and circled the number that applies to them, indicating the frequency with which they use the reading strategy implied in the statement. Thus the higher item, the more frequent the use of the strategy concerned. The OSORS measures three broad categories of reading strategies: Global Reading Strategies (15 items), Problem Solving Strategies (12 items), and Support Strategies (10 items).

Besides, their L1 (English) online reading strategies were surveyed by using OSORS to address the initial comparison of their L1 and L2 online reading strategies. However, the participants did not do no. 35-37 on OSORS in L1 online reading strategies because these items which examine the translation use or thinking in L1 or L2 at the same time are only applicable to L2 reading (see Appendix 1for OSORS survey questions). Participants may spend 8-12 minutes to fill out the OSORS survey.

Think aloud protocol. Besides, think aloud protocols were conducted in L2 online reading to corroborate the results of OSORS. The texts for thinking aloud protocols come from Fourth Year Chinese textbook (see Appendix 2 for the reading texts), so the text material is appropriate to the participants' Chinese level. This Chinese text for think aloud protocol which is in a total of 1,200 Chinese characters comprises general written Chinese language, ancient Chinese texts and idioms, and several comprehension questions followed up the texts. The questions mainly include the main ideas of the article and ask participants' opinion about the article. Participants needed to tell the researcher what they are doing and how they are reading during the task. At the same time, the researcher can also ask questions that are related to their reading. Participants reported their reading strategies or were asked questions every 2 to 3 sentences. Participants spent 40 minutes to 1.5 hour to finish this task depending on their language proficiency.

Interview. Follow-up interviews focused on what and differences between L1 and L2 reading strategies. Participants were interviewed about how they think the criteria of good readers, their online reading strategies, and their differences of L1 and L2 online reading (see Appendix 3). The interview lasted for 30 minutes to complete.

4. Results and discussion

4.1 What online reading strategies do CFL learners use in learning Chinese?

4.1.1 Results of OSORS

As shown in Table 1, 17 participants overall reported more PSS (M=3.75) and GRS (M=3.56) than SRS (M=3.29) while reading Chinese texts. Based on Oxford and Burry-Stock's (1995) criteria of strategy frequency usage: high (mean of 3.5 or higher), medium (mean of 2.5-3.4), and low (2.4 or lower), the usages of PSS and GRS indicate the high frequency whereas the usage of SRS indicate the medium frequency.

The result is consistent with Anderson's (2003) results which indicate that EFL learners were more frequently used PSS during the online reading process. This result specifies that using PSS is the direct actions and primary procedure that both CFL and EFL readers act when they are encountering reading difficulties. Since using PSS is neither necessary to intentionally monitor their reading as GRS nor to use support mechanisms to aid their comprehension as SRS, the CFL readers logically do anything they can do in the beginning, such as adjusting the reading speed, trying to get back on track, or paying closer attention to reading before trying to find outside resources to solve any reading questions they faced.

In GRS, participants report the highest use (M=4.53) of using context clues to help them better understand what they are reading online (no. 18). The second highest use

(M=4.29) of GRS is that they think about what they already knew to help them understand what they read online (no. 3).

Table 1 OSORS Results of L2 (Chinese)

Strategy			Mean	SD
Global Reading Strategies (GRS)				
1	Having a purpose in mind		3.82	0.88
3	Using prior knowledge		4.29	0.77
4	Scrolling through text		3.35	1.32
6	Analyzing if the content fits purpose		3.82	0.73
8	Noting length and organization		3.47	1.07
12	Deciding what to read closely		3.29	1.05
14	Using tables, figures and features		3.76	1.09
16	Clicking links to other sites		2.41	0.87
18	Using context clues		4.53	0.80
21	Using typographical aids (e.g., italics)		2.89	1.65
22	Evaluating what is read		3.48	0.80
24	Checking my understanding		3.52	0.80
25	Guessing what the content is about		3.54	1.20
28	Confirming predictions		3.12	1.36
30	Scanning the text before reading		3.70	1.70
		Total	**3.56**	**0.54**
Problem Solving Strategies (PSS)				
7	Reading slowly and carefully		4.12	0.86
9	Trying to get back on track		4.24	0.56
11	Adjusting reading speed		4.24	0.75
15	Paying closer attention to reading		4.35	0.79
17	Pausing and thinking about reading		3.77	0.66
20	Visualizing information read		3.53	1.12
26	Rereading for better understanding		3.94	1.25
29	Guessing meaning of unknown words		3.76	0.97
31	Skipping difficult words or sections		2.94	1.09
32	Evaluating text before using it		3.53	1.18
33	Distinguishing fact from opinion		3.76	0.90
34	Look for sites that cover both sides of an issue		2.82	0.88
		Total	**3.75**	**0.28**
Support Reading Strategies (SRS)				
2	Taking notes while reading		2.41	1.06
5	Reading aloud when text is hard		3.53	1.12
10	Printing out a hard copy of text		3.59	1.18
13	Using reference materials		5.00	0.00
19	Paraphrasing for better understanding		3.96	0.83
23	Going back and forth in text		3.06	0.83
27	Asking myself questions		2.65	0.93
35	Translating from Chinese into English		2.88	1.22
36	Thinking in both Chinese and English		3.65	1.06
37	Seeking materials in English		3.12	1.27
		Total	**3.29**	**0.46**

In PSS, participants showed the highest use (M=4.35) in paying closer attention to what they are reading (no. 15). The second highest use (M=4.23) of PSS was that they try to get back on track when they lose concentration (no. 9) and they adjust their reading speed according to what they are reading online (no. 11). In terms of SRS, all participants

showed consistently a high mean score of 5 in using reference materials to help understand what they read (no. 13).

4.1.2 Results of think aloud protocol and interview

Global Reading Strategies. The following items of GRS are used to link with participants' OSORS results and their report during think aloud protocol and interview (see Table 2).

Table 2 L2 Global Reading Strategies

Category	No	Strategy	Mean	SD
Global Strategies	18	Using context clues	4.53	0.80
	22	Critically analyze and evaluate the information	3.48	0.80
	8	Review first by noting its characteristics like length and organization	3.47	1.07
	12	Decide what to read closely and what to ignore	3.29	1.05

According to Peter's OSORS results, he showed the highest use of GRS (M=4.47), followed by PSS (M=3.64) and SRS (M=3.5). During the think aloud protocol and interview, he reported that he distinguishes when he should read quickly or read closely which is consistent with his no. 12 result of a high score of 4.00 in OSORS. He thinks if the reading pieces come from news articles or something that does not have very deep meanings, he would read very quickly. Whereas when he comes across the academic reading, he would read very closely. He also mentioned that he always scrolls down to see how long the article is and observe the organization of the article and learn how to imitate the authors' writing styles which matches with his no. 8 result of a high score of 4.00 in OSORS. What is more, when he reads articles in Chinese, he always expresses his opinions about the content and analyzes why the authors write in some ways which is not that consistent with his no. 22 result of a score of 3.00 in OSORS.

Furthermore, although participants reported the highest use (M=4.53) of using context clues to help them better understand what they are reading online (no. 18), one of participants, Tom pointed out pre-reading questions help him understand the online articles, but also restrict him to look for the specific answers. In other words, when CFL' proficiency getting higher, the context clues from the online reading materials might in turn become an obstacle interrupting their thinking process.

Problem Solving Strategies. The following items of PSS are used to link with participants' OSORS results and their report during think aloud protocol and interview.

Table 3 L2 Problem Solving Reading Strategies

Category	No	Strategy	Mean	SD
Problem Solving Strategies	9	Trying to get back on track	4.24	0.56
	11	Adjusting reading speed	4.24	0.75
	7	Read slowly and carefully	4.12	0.86
	26	Reread when text becomes difficult	3.94	1.25
	29	Guess the meaning of unknown words or phrases	3.76	0.97
	20	Visualize information	3.53	1.12
	31	Skip words or section that are difficult or unfamiliar	2.94	1.09

In terms of PSS, Mark reported during the interview that a good Chinese reader is defined as a reader who read texts carefully and slowly which is consistent with his high score of 4 for no. 7 and no. 11 in OSORS. He usually skips the sentences that he does not understand when he reads the online Chinese articles, unless they are really important, he will try to write them down and ask his Chinese tutor for help. This statement corresponded with his no. 31 result with a high score of 4.00.

Based on the results of think aloud and interview about PSS, Fred mentioned that he sometimes visualizes what he reads to better understand the article which is consistent with his high score of no. 20 on OSORS. In addition, whenever Fred encounters ancient Chinese, he said he usually puts the phrases in the online dictionary to look up each meaning of the word and then guess the meaning of the whole phrase. When the dictionary cannot help him solve the problems, he usually reads the sentences a couple of times and slowly to see if he can understand it. This statement corresponds with his high score of 5 for no. 7 and no. 29 on OSORS.

Tom also mentioned the same strategies as Fred applied. He always reads the Chinese text more than once (no. 9). The first time reading helps him get the brief idea of the article. He tries to look up some examples or Chinese slang during the second time reading. He believes that reading the Chinese articles more than once will definitely help his reading comprehension.

Support Reading Strategies. Compared to GRS and PSS usages with high frequency, participants showed medium frequency usage (M=3.29) for SRS on the OSORS. Table 4 contains the information of L2 Support Strategies used by all participants. The following session has shown the analysis of the SRS in each question.

Table 4 L2 Support Reading Strategies

Category	No	Strategy	Mean	SD
Support Strategies	13	Use reference materials (e.g., an online dictionary)	5.00	0.00
	10	Print out a hard copy of the online text then underline information	3.59	1.18
	23	Go back and forth in the online text to find relationships among ideas	3.06	0.83
	27	Ask myself questions I like to have answered in the online text	2.65	0.93
	2	Take notes while reading online	2.41	1.06

Evidently, no. 2 taking notes while reading online accounted very low mean of 2.41, which implied that this strategy was least frequently used by CFL readers for better

reading comprehension. Correspondingly, no. 27 strategies also showed low mean value of 2.65, which inferred that CFL readers rarely asked themselves to have answered in the online text. The mean value 3.06 of no. 23 implies that CFL learners sometimes look back and forth for the relationships among ideas within the text. As Mark mentioned in the interview, when he met some difficult phrases, quotes or Chinese old sayings in articles, he normally just tried to figure out the English translation for the text. If he still had problems understanding the meaning of the text, he just moved on.

In addition, paraphrasing strategy (no. 19) showed the mean value of 3.96 indicating that CFL readers obtain better reading comprehension by restating ideas in their own words. It is interesting to find that some CFL readers such as Peter, Fred, and Tom like to paraphrase the ideas of context in Chinese while Mark prefers to think in English while reading. During the interview, Fred stated that he seldom translates the online Chinese text into English while reading because he can basically go through the article and comprehend it without English translation. Tom also pointed out that he likes to learn new vocabularies by using the synonym words that he has learned in Chinese. Relatively, for Mark, reorganizing his thinking in English helped him understand the online text deeply.

Furthermore, the higher mean of 3.59 was showed for the strategy of printing out the text (strategy no. 10). In other words, CFL learners sometimes take notes while reading online text, yet they often print out the online text, and then underline the information to assist their memorization of the text. Peter further explained that the reason he prefers to have an electronic version of the readings is because it is easier for him to look up the vocabulary by copying and pasting the online text. What is more, it is also convenient for him to make a record of personal vocabulary lists as a digital format. Additionally, Fred, Tom and Mark also indicated that they have a preference to print out the online readings for academic purposes. It is much easier for them to underline the text and write down the Pinyin (pronunciation in Romanization), tone and English translation on the sides.

As for most frequently used strategy under the category of SRS, all participants circled 5 (always or almost always do this) for using reference materials strategy (no. 13). According to Tom, whether readers have sufficient background knowledge of the text influences the way they interpret and comprehend the text. When he ran into difficulties of understanding the Chinese articles due to his lack of background knowledge of Chinese historical events or economy, he tried to look up some background information either in Chinese or in English. Similarly, during the process of think-aloud protocols, Peter even spent time on finding the original quote of the Chinese literacy language such as Mencius and Tsang's sayings mentioned in the think-aloud text. In short, all participants reported that they always look up some additional background information to help themselves understand the Chinese articles better.

4.2 What are the differences of online reading strategies that CFL learners use in L1 and L2?

This research question focuses on analyzing the different online reading strategies that CFL learners have used in English (L1) and Chinese (L2). The comparative data came from the results of the OSORS and the individual interview data were used to address this question triangularly. The descriptive results of OSORS showed that participants used more GRS (M=3.80) and PSS (M=3.87) in L1 contexts than then counterparts (M=3.56 and 3.74 respectively) in L2 contexts; whereas they used more SRS (M=3.29) in L2 contexts than in L1 contexts (M=2.63) (see Table 5).

Paired samples *t* test and Benjamini & Hochberg's (1995) False Discovery Rate procedure further indicated that participants used statistically significantly more GRS than SRS in L1 contexts ($t(16) = 7.038$, $p < .001$). It suggested that participants preferred to use GRS than SRS when reading English academic texts. As for SRS, participants used statistically significantly more in L2 contexts than in L1 contexts ($t(16) = 5.76$, $p < .001$). This showed that SRS were more needed by participants when reading Chinese texts than English texts.

Table 5 OSORS Results of L1 (English) and L2 (Chinese)

	L1 (GRS)	L2 (GRS)	L1 (PSS)	L2 (PSS)	L1 (SRS)	L2 (SRS)	L1 (Total)	L2 (Total)
Mean	3.80	3.56	3.87	3.74	2.63	3.29	3.58	3.55
SD	.61	.55	.36	.28	.63	.46	.43	.35

Furthermore, paired samples *t* test also showed that two items in PSS and two items in SRS had significant differences between L1 and L2 (see Table 6). These items with significant differences will be discussed with the results of think-aloud protocols and interview.

In PSS, participants can distinguish between fact and opinion significantly more in English (M=4.76) than in Chinese (M=3.76) ($t(16) = -4.408$, $p < .001$). Participants also looked for sites that cover both sides of an issue (M=3.7) in English contexts than in Chinese (M=2.82) ($t(16) = -3.273$, $p=.005$). Several participants mentioned that the reason that they looked for websites in Chinese less frequently than in English was because it was difficult for them to judge whether some Chinese websites are reliable enough for academic purposes, so they seldom use this strategy. On the contrary, they are more confident to judge the reliability of English websites, so they tend to use this strategy in English contexts. In addition, some participants mentioned that due to the lack of Chinese language proficiency and cultural knowledge, they sometimes have difficulty with distinguishing between fact and opinion in Chinese contexts than in English contexts.

Table 6 Items of reading strategy use that have significant differences between L1 and L2

Category	No	Strategy	L1 Mean	L2 Mean
Problem Solving	33	Distinguish between fact and opinion	4.76	3.76
	34	Look for sites that cover both sides of an issue	3.7	2.82
Support	10	Print out a hard copy and then underline or circle information	2.5	3.5
	13	Use reference materials (e.g., an online dictionary)	2.12	5

As far as the items that have significant differences under the SRS concerned, participants tend to print out the hard copy and underline or circle information significantly more frequently in Chinese contexts (M=3.5) than in English contexts (M=2.5) ($t(16) = 4.012$, $p=.001$). Several participants pointed out that have a preference to print out online readings for academic purposes because it is easier for them to underline the text and write down the Pinyin (pronunciation in Romanization), tone and English translation on the sides which can assist their comprehension of Chinese readings. However, they indicated that they do not need to do these when reading English texts.

What's more, all participants always use reference materials to help their reading comprehension while they seldom do this in English ($t(16) = 11.973$, $p < .001$). During the interviews, several participants reported that the greatest difference between reading Chinese and English online articles was about the context and vocabulary, so they need to use more reference materials in reading Chinese text to understand not only the language itself, but also the background knowledge of the topics.

5. Implications

The results revealed that participants highly relied on the reference materials when reading Chinese texts, so teachers should offer students several useful online reference materials and the strategies of using them to better serve their needs. For instance, in addition to looking up the meanings of unknown words, students also need to know how to use these words in sentences, and their syntactic features. Students at this advanced proficiency levels also have to expand their vocabulary inventory to help them read efficiently.

Moreover, in light of the results of the current study, these advanced CFL learners need to expose themselves more in Chinese culture to resolve the problems when they come across ancient Chinese texts or idioms since culture and language are inseparable. Therefore, it will be essential if Chinese teachers can increase CFL learners' cultural awareness by integrating Chinese culture into language teaching. For example, when teaching ancient Chinese texts and idioms, teachers can introduce the cultural background and history behind these phrases to help students deeply understand contents and contexts. Additionally, teachers can also take advantage of modern technological means, such as videos and movies, to explicitly show students' the Chinese cultural uniqueness. What is more, teachers can provide students with the real scenarios and societal

phenomenon to discuss and compare with American counterparts. In this way, these can not only indirectly boost students' confidence in judging the fact and opinion of the online information, but also develop their information-synthesizing and critical thinking ability.

6. Conclusion and limitation

This study examined online reading strategies among advanced CFL learners in two aspects: the metacognitive online reading strategies use and the differences of reading strategies use between CFL readers' L1 and L2. The results showed that participants used PSS more frequently than GRS and SRS. In addition, participants' use of GRS had significantly more than SRS in English. Their use of SRS in Chinese had significantly more than in English. Nevertheless, there are some limitations of this study.

First of all, the data obtained from the OSORS were self-reported by the survey information. These self-reported data might not be consistent with the think-aloud results because the participants may not use every strategy they have self-reported during the online reading process. Additionally, the participants might use varied strategies when they are reading the articles with different subjects or language levels. It is also possible that the learning style influences how participants use reading strategies. In addition, participants reflected their L1 online reading strategies use only through the OSORS survey and interviews which might also decrease the validity of the results. Thus, for future study, think-aloud tasks should be given both in English and in Chinese. The think-aloud reading materials could be in different subjects and levels in order to precisely compare the similarities and differences of online reading strategies use among CFL readers.

Second, the current research contributed to the clarification of what online reading strategies CFL readers use. Yet, this study did not explore the question of what makes a better model of L2 online reading ability. In order to develop new approaches in online reading instructions to facilitate CFL readers on web-based standardized tests, future studies might also consider to explore the question of what factors can be applied to improve L2 online reading ability by comparing different levels of CFL learners.

References

Anderson, N. J. (2003). Scrolling, clicking, and reading English: Online reading strategies in a second/foreign language. *The Reading Matrix, 3*, 1-33.

Block, E. (1986). The comprehension strategies of second language readers. *TESOL Quarterly, 20*(3), 464-494.

Coiro, J. & Dobler, E. (2007). Exploring the online comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, 42, 214-257.

Lau, K.L., & Chan, D. W. (2003). Reading strategy use and motivation among Chinese good and poor readers in Hong Kong. *Journal of Research in Reading, 26*, 177-190.

Mokhtari, K. & Sheorey, R. (2002). Measuring ESL students' awareness of reading strategies. *Journal of Development Education, 25*(3), 2-10.

Myles, F. (2002). Second Language Acquisition (SLA) research: its significance for learning and teaching. In: *The Guide to Good Practice for learning and teaching in Languages, Linguistics and Area Studies.* Downloaded from http://www.llas.ac.uk/resources/goodpractice.aspx?resourceid=421

Oxford, R. & Crookall, D. (1989). Research on language learning strategies: Methods, findings, and Instructional Issues. *The Modern Language Journal, 73*(4), 404-419.

Pookcharoen, S. (2009). Metacognitive online reading strategies among Thai EFL university students. Dissertation. Indiana University Bloomington.

Tanyeli, N. (2008). The efficiency of online English language instruction on students' reading skills. Paper presented at the International Technology, Education and Development Conference, Valencia, Spain, Mar. 3-5, 2008.

Tercanlioglu, L. (2004). Postgraduate students' use of reading strategies in L1 and ESL contexts: Links to success. *International Education Journal,5(4), 562-570.*

Uso-Juan, E. & Ruiz-Madrid, M. (2009). Reading printed versus online texts. A study of EFL learners' strategic reading behavior. *International Journal of English Studies*, vol. 9 (2), 59-79.

Uzunboylu, H. (2005). The effectiveness of web assisted English language instruction on the achievement and attitude of students. *Educational Technology Research and Development*. (54), 201-209

Yang, S. S. (2010). The influence of schema and cultural difference on L1 and L2 reading. *English Language Teaching*. Vol. 3, No.4. 175-180

Zhang, C. (2006). On variables affecting L1 transfer in L2 acquisition. *Sino-US English Teaching.* Vol. 3, No.5 (Serial No.29), ISSN1539-8072, USA 53

Appendix 1: Online Survey of Reading Strategies

The purpose of this survey is to collect information about the various techniques you use when you read academic materials in Chinese (e.g., reading textbooks for homework or examinations, read journal articles, etc.).

All the items below refer t your reading of college-related academic materials (such as textbook, not newspapers or magazines).

Each statement is followed by five numbers, 1, 2, 3, 4, and 5, and each number means the following:

"1" means that "I never or almost never do this".
"2" means that "I do this only occasionally".

"3" means that "I sometimes do this". (About 50% of the time.)
"4" means that "I usually do this".
"5" means that "I always or almost always do this".

After reading each statement, circle the number (1, 2, 3, 4, or 5) which applies to you. Note that there are not right or wrong responses to any of the items on this survey.

	Statement	Never				Always
1.	I have a purpose in mind when I read online.	1	2	3	4	5
2.	I take notes while reading online to help me understand what I read.	1	2	3	4	5
3.	I think about what I already know to help me understand what I read online.	1	2	3	4	5
4.	I first scroll through the online text to see what it is about before reading it.	1	2	3	4	5
5.	When online text becomes difficult, I read aloud to help me understand what I read.	1	2	3	4	5
6.	I analyze whether the content of the online text fits my reading purpose.	1	2	3	4	5
7.	I read slowly and carefully to make sure I understand what I am reading online.	1	2	3	4	5
8.	I review the online text first by noting its characteristics like length and organization.	1	2	3	4	5
9.	I try to get back on track when I lose concentration.	1	2	3	4	5
10.	I print out a hard copy of the online text then underline or circle information to help me remember it.	1	2	3	4	5
11.	I adjust my reading speed according to what I am reading online.	1	2	3	4	5
12.	When reading online, I decide what to read closely and what to ignore.	1	2	3	4	5
13.	I use reference materials (e.g., an online dictionary) to help me understand what I read online.	1	2	3	4	5
14.	I use tables, figures, and pictures in the online text to increase my understanding.	1	2	3	4	5
15.	When online text becomes difficult, I pay closer attention to what I am reading.	1	2	3	4	5
16.	When academic sites have links to other sites, I click on them to see what they are.	1	2	3	4	5
17.	I stop from time to time and think about what I am reading online.	1	2	3	4	5
18.	I use context clues to help me better understand what I am reading online.	1	2	3	4	5
19.	I paraphrase (restate ideas in my own words) to better understand what I read online.	1	2	3	4	5
20.	I try to picture or visualize information to help remember what I read online.	1	2	3	4	5
21.	I use typographical features like bold face and italics to identify key information.	1	2	3	4	5
22.	I critically analyze and evaluate the information presented in the online text.	1	2	3	4	5
23.	I go back and forth in the online text to find relationships among ideas in it.	1	2	3	4	5
24.	I check my understanding when I come across new information.	1	2	3	4	5

25.	I try to guess what the content of the online text is about when I read.	1	2	3	4	5
26.	When online text becomes difficult, I reread it to increase my understanding.	1	2	3	4	5
27.	I ask myself questions I like to have answered in the online text.	1	2	3	4	5
28.	I check to see if my guesses about the online text are right or wrong.	1	2	3	4	5
29.	When I read online, I guess the meaning of unknown words or phrases.	1	2	3	4	5
30.	I scan the online text to get a basic idea of whether it will serve my purposes before choosing to read it.	1	2	3	4	5
31.	I skip words or sections I find difficult or unfamiliar.	1	2	3	4	5
32.	I critically evaluate the online text before choosing to use information I read online.	1	2	3	4	5
33.	I can distinguish between fact and opinion in online texts.	1	2	3	4	5
34.	When reading online, I look for sites that cover both sides of an issue.	1	2	3	4	5
35.	When reading online, I translate from Chinese into English.	1	2	3	4	5
36.	When reading online, I think about information in both Chinese and English.	1	2	3	4	5
37.	When I encounter difficult reading in Chinese, I seek material on the same topic in English.	1	2	3	4	5

Appendix 2: Text for Think Aloud Protocol

梁启超：最苦与最乐

人生什么事最苦呢？贫吗？不是。失意吗？不是。老吗？死吗？都不是。我说人生最苦的事，莫苦于身上背着一种未了的责任。人若能知足，虽贫不苦;若能安分（不多作分外希望），虽然失意不苦，老，死乃人生难免的事，达观的人看得很平常，也不算什么苦。独是凡人生, 在世间一天，便有一天应该的事。该做的事没有做完，便像是有几千斤重担子压在肩头，再苦是没有的了。为什么呢？因为受那良心责备不过，要逃躲也没处逃躲呀！

答应人办一件事没有办，欠了人的钱没有还，受了人的恩惠没有报答，得罪了人没有赔礼，这就连这个人的面也几乎不敢见他，纵然不见他的面，睡里梦里，都像有他的影子来缠着我。为什么呢？因为觉得对不住他呀！因为自己对他的责任，还没有解除呀！不独是对于一个人如此，就是对于家庭，对于社会，对于国家，乃至对于自己，都是如此。凡属我受过他好处的人，我对于他便有了责任。凡属我应该做的事，而且力量能够做得到的，我对于这件事便有了责任。凡属我自己打主意要做一件事，便是现在的自己和将来的自己立了一种契约，便是自己对于自己加一层责任。有了这责任，那良心便时时刻刻监督在后头，一日应尽的责任没有尽，到夜里头便是过的苦痛日子。一生应尽的责任没有尽，便死也带着苦痛往坟墓里去, 这种苦痛却比不得普通的贫困老死，可以达观排解得来。所以我说人生没有苦痛便罢，若有苦痛，当然没有比这个加重的了。

翻过来看，什么事最快乐呢？自然责任完了，算是人生第一件乐事。古语说："如释重负"，俗语亦说："心上一块石头落了地"。人到这个时候。那种轻松愉快，简直是不可以言语形容。责任越重大，负责的日子越久长，到责任完了时，海阔天空，心安理得，那快乐还要加几倍哩！大抵天下事从苦中得来的乐才算真乐。人生须知道有负责任的苦处，才能知道有尽责任的乐处。这种苦乐循环，便是这有活力的人间一种趣味。不尽责任，受良心责备，这些苦都是自己找来的。翻过来看，处处尽责任，便处处快乐; 时时尽责任，便时时快乐。快乐之权，操之在己。孔子所以说："无入而不自得" ，正是这种作用。

然而为什么孟子又说："君子有终身之忧"呢？因为越是圣贤豪杰，他负的责任越是重大，而且他常要把这种种责任来揽在身上，肩头的担子从没有放下的时候。曾子还说："任重而道远"，"死而后已，不亦远乎？"那仁人志士的忧民忧国，那诸圣诸佛的悲天悯人，虽说他是一辈子感受苦痛，也都可以。但是他日日在那里尽责任，便日日在那里得苦中真乐，所以他到底还是乐，不是苦呀！

有人说："既然这苦是从负责任而生的，我若是将责任卸却，岂不是就永远没有苦了吗？"这却不然，责任是要解除了才没有，并不是卸了就没有。人生若能永远像两三岁小孩，本来没有责任，那就本来没有苦。到了长大成人，责任自然压在你的肩头上，如何能躲？不过有大小的分别罢了。尽得大的责任，就得大快乐; 尽得小的责任，就得小快乐, 你若是要躲，倒是自投苦海，永远不能解除了。

阅读理解

1. 责任有种种，你能从课文中找出有哪几种责任吗？
2. 为什么"凡属我应该做的事，而且力量能够做得到的，我对于这件事便有了责任"？请举例说明。
3. 这篇文章的中心论点是什么？作者用哪些论据来证明论点？
4. "从苦中得来的乐，才算是真乐"，你同意这个说法吗？
5. 责任能够逃避吗？请说明在你目前的生活中，哪些责任是根本逃避不了的？逃避会有什么后果？
6. 每段都用一个问句开头，这种写法有什么好处？

Appendix 3: Interview Questions

Pre-reading

1. On a scale of 1 to 5 (5 being the highest and 1 being the lowest),
   - how much do you know about this topic?
   - how much does this topic interest you?

2. In your opinion, what do good English/CFL readers do when they are reading for information on the Internet?

Post-reading

1. On a scale of 1 to 5 (5 being the highest and 1 being the lowest),
   - how much did you enjoy the task you did today?
   - how successful were you at completing the task you did today?

2. In your opinion, what do good English/ CFL readers do when they are reading for information on the Internet?
3. If your teacher asked you to give advice to other English/ CFL learners about how to read on the Internet, what would you tell the students about the things that happen in your mind when you read on the Internet?
4. As you were searching on the Internet today, what worked best for you to find the answer in English/Chinese?
5. As you were reading from the Chinese materials, what reading strategies worked best for you to find the answer?
6. What kinds of things are helpful to know when you are reading Chinese materials on the Internet and trying to figure out what to read next? Are some of these more useful than others?
7. Do you ever find yourself making predictions as you read English/Chinese on the Internet? If so, explain when?
8. Do you think your L1 (English) influence the way you interpret L2 (Chinese) as you read Chinese on the internet? If so, explain how?
Does your L1 (English) promote your ability in L2 (Chinese) comprehension as you read Chinese materials on the internet? Give some examples?
9. What will you do when bumping into difficult words in Chinese/ English online materials?
10. What will you do when you cannot understand the meaning of the online Chinese/English text?
11. What do you think Chinese online reading and English online reading have in common?
12. In your opinions, what are differences between Chinese online reading and English online reading?
13. As a CFL learner, what are the strengths and weakness that you have in reading Chinese on the Internet?