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Effective strategy groups used by readers of Chinese as a foreign language

Sha Huang
Kennesaw State University
United States

Abstract

Second language (L2) reading research suggests that successful reading comprehension usually involves a repertoire of strategies. Although Chinese is considered to be a challenging language for foreign language readers, thus far, few studies have investigated how strategies are orchestrated by readers of Chinese as a foreign language (CFL) to enhance comprehension. This study investigated how L2 Chinese readers grouped multiple strategies to comprehend a Chinese text. Through think-aloud and recall protocols, observations, and interviews, it identified several strategy clusters and pairs that helped adult CFL readers to infer words, monitor comprehension, and segment words successfully. It also revealed interrelations between and among strategies within each cluster and pair. The results showed that successful use of strategies in CFL reading usually involves context and multiple linguistic cues. In addition, vocabulary and grammar knowledge play important roles in CFL readers' use of reading strategies.

Keywords: second language reading, reading strategies, reading Chinese as a foreign language, adult CFL learners, think-aloud protocol

Due to economic globalization and national security interests, there has been an increasing interest in teaching and learning Mandarin Chinese in the United States. The number of higher education institutions reporting enrollments in Chinese has more than doubled, from 412 in 1990, to 866, in 2013, and the enrollment in Chinese has more than tripled, from 19,427 in 1990 to 61,055 in 2013 (Goldberg, Looney, & Lusin, 2015). This growing interest calls for research into effective instruction of the Chinese language.

One essential skill in language learning is reading, which must be learned through instruction (Everson, 2009). It is a critical skill for functioning meaningfully in a modern society and provides access to information and resources that cannot be obtained by oral communication. Scholars commonly agree that effective use of reading strategies contributes to reading comprehension (Bernhardt, 2005, 2011; Chang, 2010; Grabe, 2009; Pressley, 2002) and successful reading usually involves a repertoire of strategies (Grabe, 2009; Pressley & Harris, 2006). Thus far, most research on second language (L2) reading strategies has been conducted with L2 readers of alphabetic languages such as English (Abbott, 2006; Phakiti, 2003a; Plakans,

2009) and Spanish (Young & Oxford, 1997).

Reading Chinese is one of the most challenging endeavors for learners of CFL (Everson, 2009; Lee-Thompson, 2008). One of the main reasons is the linguistic distance between Chinese and alphabetic languages such as English, which results in learners needing more time to acclimate to Chinese texts (Everson, 2009). Therefore, it is important to study how CFL learners successfully orchestrate multiple strategies in reading to enhance comprehension. Research about this issue will enhance our understanding about CFL reading as well as L2 reading in general.

Literature Review

This section provides a brief literature review of L2 reading models, L2 reading strategies, and CFL reading

Models of L2 Reading

In the last several decades, approaches to the study of reading have evolved from viewing reading either as a bottom-up or top-down process to conceptualizing it as an interactive process (Bernhardt, 1991; Just & Carpenter, 1992). According to this latter view of reading, readers combine useful resources and elements from both bottom-up processing (e.g. decoding words and sentences) and top-down processing (e.g. strategic processing, inferencing, and using background knowledge) to construct a representation of the information they have read (Grabe, 2009). According to the interactive model, context and background knowledge can be used to support lower-level processes such as word recognition and syntactic parsing; and inferences work to improve the efficiency of word recognition processes (Grabe, 2009).

Based on the interactive model of reading, Bernhardt (2005, 2011) proposed a compensatory model of L2 reading. This model predicts the impact of three dimensions on L2 reading: first language (L1) literacy which accounts for about 20% variance of L2 reading comprehension; L2 knowledge which explains about 30% of L2 reading comprehension; and the remaining 50% of variance is attributed to an unexplained dimension, which includes comprehension strategies, engagement, content and knowledge domains, interest, motivation, and so on. Bernhardt emphasized that all three dimensions are not additive, but instead work synchronically and interactively. She also pointed out the need for conducting research on the interplay of these components (Bernhardt, 2005). To extend this model, McNeil (2012) discussed further the contributions of comprehension strategies, predicting that they are greater for students at higher levels than those at lower levels. This prediction suggests the significance of studying L2 reading strategies.

This study focused on reading strategies, a component included in the dimension of uncertain variance, and explored how this variable interacted with other components such as L2 grammar and vocabulary knowledge.

L2 Reading Strategies

Researchers have been interested in identifying reading strategies and classifying them into different categories based on various frameworks. One way to group reading strategies is to define them as global and local strategies, or top-down and bottom-up strategies (Abbott, 2006; Block, 1986; Lee-Thompson, 2008). Top-down strategies are applied to gain a holistic understanding of larger parts of a text. They focus on main ideas, discourse organization, and the use of background knowledge (Plakans, 2009). Bottom-up strategies are used to solve difficulties in comprehending smaller linguistic units such as characters, words, phrases, and sentences. Reading strategies can also be defined as cognitive and metacognitive strategies (Phakiti, 2003a, 2003b; Purpura, 1998). Cognitive strategies appear as conscious behaviors that individuals use to process language to understand, learn, or use it in some context (Phakiti, 2008). Examples include guessing from context, noting discourse organization, recognizing a transition phrase, skipping a word, and identifying a main idea (Grabe, 2009). Metacognitive strategies regulate cognitive strategies and other processing (Phakiti, 2008). They usually involve constant monitoring, regulation, and orchestration of cognitive processes to achieve cognitive goals (Phakiti, 2003b). Examples of metacognitive strategies include: evaluating reading materials, repairing miscomprehension, evaluating the developing understanding of text, adjusting reading speed, and selecting cognitive strategies accordingly. Sometimes, these two taxonomies are combined. In a study of CFL readers' strategies, Lee-Thompson (2008) categorized reading strategies into two main groups, bottom-up and top-down strategies, with metacognitive strategies grouped as a subcategory of top-down strategies. This framework was used in the present study.

Researchers have investigated strategies of successful readers to identify strategies as effective in supporting reading, and most of these effective strategies are top-down. In pioneering studies about L2 reading strategies (Hosenfeld, 1977, 1984), several strategies were identified as helpful: keeping the meaning of the text in mind, skipping unimportant words, and inferring word meaning from context. Grabe (2009) also summarized several strategies that had been identified as supportive of reading comprehension: summarizing, monitoring comprehension, using text structure, making inferences, and activating prior knowledge. Recognition of text structure and the use of prior knowledge were also identified as helpful by Block (1986) in his study of comprehension strategies of L2 learners. In a more recent article, Bernhardt (2012) concluded that strategic readers (a) reflect on information in the text after reading; (b) summarize text information; (c) use support processes such as rereading, noticing comprehension breakdown, inferring by using prior text and background knowledge, and linking key parts of the text for cohesiveness and forming an initial summary; (d) relate text information to prior knowledge; (e) attend to text structure to aid comprehension; (f) monitor for comprehension continually; and (g) form questions and find answers to questions in the text.

Another finding shared by scholars (Block, 1986; Sheorey & Mokhtari, 2001) is that good readers usually do not rely on one individual strategy, but tend to use multiple strategies, and they are better at applying a repertoire of strategies flexibly to specific reading contexts (Grabe, 2009; Pressley & Harris, 2006).

Reading Chinese as a Foreign Language

Thus far, few studies of reading Chinese as a foreign/second language have been conducted. Shen (2008) conducted a study to examine word segmenting strategies of 40 college beginning and advanced learners of Chinese when they read Chinese sentences. Her findings indicated that CFL learners used various strategies requiring multiple levels of linguistic knowledge about characters, morphology, and syntax. The strategy of matching the target item to the existing mental lexicon is commonly used for both beginning and advanced learners, while the strategy of using context to make decisions is more used at the advanced level. Jiang and Fang (2012) investigated the impacts of contextual and word morphology clues on CFL learners' interpretation of unknown words. Thirty-six intermediate-level learners of Chinese were asked to infer the meaning of compound words under three conditions: (a) the word-only condition, (b) the context-only condition with the target words omitted, (c) the word plus context clues condition, in which target words were presented within specific sentences. Results showed that both sentence context and word morphology provided information in the word inferring process, and the integration of both sources of information resulted in better interpretation of word meaning. A qualitative study of CFL readers' word inferring strategies used in reading Chinese sentences revealed that learners who were good at word processing were skillful in using multiple strategies, interpreting contextual information, and identifying character meaning in words (Huang, 2014). However, all these studies focused on lower-level processing, such as segmenting or inferring words in a sentence, and none of them explored strategies used in processing a Chinese text.

Two representative studies investigated how CFL readers process texts with multiple paragraphs. An early study of adult CFL readers' reading processes (Everson & Ke, 1997) suggested that an orthographic layer of difficulty should be added to the L2 reading model as a component of word recognition. It also showed that intermediate students had many difficulties with lower-level processing, such as recognition of characters and words and isolating word units in the text. This study was validated and extended by Lee-Thompson (2008), who investigated eight CFL learners' reading strategies using a think-aloud and recall protocol as well as interviews. Data revealed 12 bottom-up strategies, among which translating, marking the text, and writing a pinyin and/or English equivalent were the three most frequently used strategies. On the other hand, the most common strategies among 14 top-down strategies were paraphrasing, hypothesizing, and monitoring comprehension. Data from this study also showed a higher frequency of using bottom-up strategies in CFL reading. Although this study identified a list of strategies used by CFL readers, it did not discuss interrelations between and among these strategies.

Previous L2 research consistently concluded that strategies do not occur in isolation and multiple reading strategies are used to facilitate comprehension in CFL reading. However, thus far, an extremely limited number of studies have examined how strategies work together to enhance CFL reading at the discourse level. To address this gap, the present study answers the following questions:

1. How do reading strategies interact with each other in the process of CFL reading?
2. What are some of the main patterns of interaction that help to enhance the comprehension of intermediate-level CFL readers?

Method

A qualitative methodology was chosen as the research paradigm due to the research purpose. Since this study aimed to reveal how strategies interacted to enhance CFL reading, it focused on "process" (Bogdan & Biklen, 1997), which made a qualitative paradigm a better design.

Participants and Setting

Twelve Chinese language learners at a public university in the United States participated in this study. They were all enrolled in a third-year-Chinese language course when the data were collected. According to the curriculum of the Chinese language program, they were at the intermediate level of the ACTFL guidelines (ACTFL, 2012). This group was chosen because they were at a transitional stage when they could process longer Chinese texts with conscious use of strategies, but had not reached a stage when reading becomes fluent and automatic.

The age of participants ranged from 18 to 40. Ten were undergraduates and two were graduate students, four male and eight female. Four participants were raised in homes where Chinese was spoken occasionally. Thus, they were identified as heritage learners based on a widely used definition (Polinsky & Kagan, 2007). All the other participants were native speakers of English, except for one whose L1 was French. Five learners had studied Chinese in high school, and all participants had studied Chinese at the college level for at least 1.5 years. All learners had experience learning a foreign language other than Chinese. Eight of them had participated in a study-abroad Chinese program in China at least once. Three participants majored in Chinese, while others studied majors such as biochemistry, accounting, international studies, finance, linguistics, marketing, economy, computer engineering, and speech pathology (See Appendix C, Table C1 for demographic information).

Reading Materials

The Chinese text used in this study was adapted from the essay "Chinese Parents and American Parents" that was included in an online reading program called Chinese Reading World (see Appendix A for the text and its translation). Participants confirmed that they had not read this essay previously. The essay compares parenting styles of American and Chinese parents. The first two paragraphs summarize the main differences between American and Chinese parenting styles. The third paragraph provides two examples that demonstrate these differences. In the last paragraph, the author makes a short conclusion. There are 597 characters in the text.

This essay has some characteristics that made it an appropriate text for the study. First, it is an expository text. Many researchers believe that compared with narrative texts, expository texts impose more challenges on readers (Snow, Griffin, & Burns, 2005; Williams, 2007). As such, in this study the expository text helped to elicit strategies used to compensate for comprehension gaps, such as using prior knowledge, inferring words, using context cues, and re-reading. The second reason for choosing this text is its clear text structure. The aim was for the expository text to elicit the strategy of using text structure clues, a strategy that helps readers to integrate different parts of the texts and facilitate L2 reading (Grabe, 2009).

The text was adapted for the level of participants. Based on research on linguistic complexity and readability (Shen, 2005), the text was modified so that 2% of characters had not been learned by the participants in class. This resulted in a text that is only moderately challenging and primed to elicit strategies without being either distractingly frustrating or too easy to read. When adapting the text, the textbook glossary and Chinese instructors' opinions were consulted. According to post-task interviews, readers' average rating of the text difficulty was 2.5 on a scale of 1–5 (with 1 indicating extremely easy and 5 indicating extremely difficult), which indicates that this difficulty level was moderate and appropriate for the purpose of this study.

Instruments

Three primary instruments were used: a think-aloud protocol to access strategies, a recall protocol to assess that a strategy had led to comprehension, and a follow-up interview to triangulate data.

A think-aloud protocol or verbal report is a method widely used by second language acquisition (SLA) researchers to collect data. Think-aloud reports are categorized either as introspective verbalization, which requires readers to report verbally when performing a task, or as retrospective verbalization, which is conducted after the processing has taken place (Leow & Morgan-Short, 2004). In this study, an introspective think-aloud method was used. Not constrained by memory, it is considered to be a better reflection of learners' processes (Cohen, 2000; Ericsson & Simon, 1993). Since this study attempted to investigate CFL learners' strategy use in the process of reading, introspective reports were used as a better match for the purpose of the study. A pilot study showed that some participants were not very good at verbalizing their complete mental process while reading; thus, probing questions such as, "How did you guess the meaning of this word?" were asked when necessary in the full study. Fully aware of the possible impact of this method on readers' cognitive processes, the researcher asked participants' opinions in the interview about the think-aloud protocol and how it affected their reading process. Their answers were taken into consideration when the data were analyzed.

A written recall protocol was conducted immediately after the think-aloud task. It required readers to read or listen to a passage and then to write everything they could remember. Written recall has been widely used in L2 reading research (Chang, 2010; Everson & Ke, 1997; Lee-Thompson, 2008) as a measure of reading comprehension. L2 scholars have recommended this assessment for its multiple benefits over other traditional measures such as providing no leading information related to text content, helping readers integrate components of reading passages (Bernhardt, 1991), and identifying readers' comprehension errors (Everson & Ke, 1997). It was used to evaluate participants' reading comprehension and supplement think-aloud data to identify successful cases of strategy use.

Interviewing was the third data collection method used in this study. Interview data were used to elicit readers' rationales for using strategies under specific circumstances, their background as learners, and their perceptions about reading strategies and the present study. This interview data supplemented and triangulated the think-aloud data, and helped to reveal the relationships between and among strategies when multiple strategies were used simultaneously.

Procedure

The researcher individually met each participant twice to collect the data. At the first meeting, the researcher explained the procedure, provided instruction about the think-aloud protocol, and played a sample audio file of a think-aloud to help participants understand this method. Then participants practiced thinking aloud when reading a short passage in Chinese. After that, they were asked to read the text developed for this study in the way they read their reading assignments for class. They were allowed to use a dictionary, mark the text, and take notes. While reading, participants orally expressed their thoughts in English and provided justifications for their actions as thoroughly as possible. If a participant stopped verbalizing for more than 10 seconds, the researcher would ask prompting questions (e.g., "What are you thinking now?"). Participants were allowed to take as much time as they wanted to read the text. When participants were reading the text, the researcher closely observed their behavior and took notes. After they finished reading, participants recalled the content of the text in as much detail as possible and typed it in English on a computer. In this phase they did not orally express their thoughts.

Immediately after the recall task, participants were interviewed about their rationales for using particular strategies while reading the text (e.g., "Just now I noticed that when you read the second paragraph, you paused here and came back to re-read the first paragraph. Could you explain why you did that?"), and then they answered general questions about their background as readers, commonly used reading strategies, perceptions of these reading strategies, and opinions of the think-aloud protocol and the text's difficulty (see Appendix B for general interview questions).

At the second meeting, the researcher conducted a member check (Merriam, 2009) with the participant by sharing parts of transcripts, preliminary coding, and main themes with each participant to elicit their feedback. All the steps were audio recorded except for the study introduction and the recall task.

Data Analysis

Think-aloud recordings were transcribed and analyzed line by line to identify individual reading strategies used by CFL readers. Strategy terms and taxonomies used in previous studies (Chang 2010; Lee-Thompson, 2008) were referred to and adapted to fit the data from this study. Data from multiple sources such as participants' think-aloud transcripts, interview transcripts, and their performance on the recall task were triangulated to deepen the researcher's interpretation.

The recall protocols were analyzed based on the following method proposed by Bernhardt (1983): the original text was divided into separate idea units; a point or a half point was rewarded for each idea unit from the text that appeared or was implied by the protocol. There were 120 units and the full score for the recall protocol was 87.

When analyzing think-aloud transcripts, two coders identified participants' cases of effective use of strategies using the following criteria: participants succeeded in applying reading strategies to

(a) solve comprehension difficulties; (b) detect their misinterpretations of the text; (c) correctly adjust or modify their comprehension; (d) confirm or reinforce correct interpretation/inferences and; (e) generally enhance their overall comprehension (see Appendix D for examples). Participants' recall protocol results were also referenced to verify the cases of successful strategy use. The interrater reliability was 0.87 and disagreement was resolved through discussion.

Results showed that in these cases, some strategies repeatedly co-occurred in clusters and pairs. Frequencies of these strategy clusters and pairs were counted. By analyzing the think-aloud transcripts of effective cases of strategy use, the researcher then looked into the relationships between and among strategies within each cluster and pair, and then drafted preliminary diagrams to show their interrelations. Interview data that revealed readers' rationales for using particular strategies were used to triangulate the think-aloud data.

When the preliminary analysis was finished, the researcher implemented a peer review (Merriam, 2009) by inviting a colleague to read the raw data (including five randomly chosen think-aloud and interview transcripts, all the codes, and the diagrams of strategy groups), then discuss and assess the findings. The inter-coder reliability of strategy coding was 0.83 and disagreement was resolved through discussion. Based on peer review results, the researcher revised the diagrams of strategy clusters and pairs.

Results

This section first reports findings on how reading strategies interact in CFL reading, and then focuses on several main patterns of interaction that enhance the comprehension of intermediate level of CFL readers.

How Reading Strategies Interact in CFL Reading

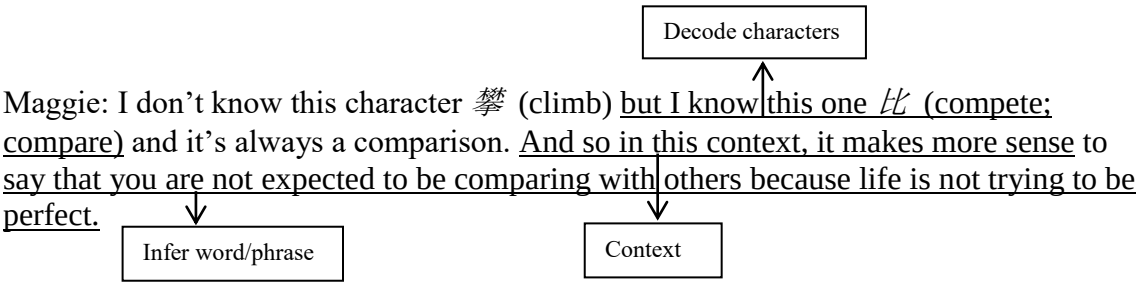
The researcher identified 26 strategies including 14 bottom-up strategies and 12 top-down strategies (See Appendix C, Table C2). Cases of successful strategy use were coded based on the criteria explained on Appendix D. Analysis of these cases showed that strategies used in CFL reading interact in two ways: strategy pairs and clusters. A pair involves two strategies used at the same time, usually with a lower-level strategy contributing to the use of a higher-level strategy. A cluster consists of three or more strategies used simultaneously. Clusters can be categorized in two ways: (a) simultaneous clusters that include two or more sub-strategies working together to facilitate the use of a higher-level strategy or, (b) hierarchical clusters with multiple levels' of sub-strategies contributing to effective use of a higher-level strategy. For example, the second level sub-strategy contributes to the use of the first, which facilitates the use of the main strategy — the higher-level strategy.

Strategy Clusters and Pairs that Enhance the Comprehension of Intermediate-level CFL Readers

This section reports on strategy clusters and pairs which supported CFL readers to infer words or phrases, monitor comprehension, and segment words. These clusters and pairs were selected because of their higher frequencies and their roles in solving unique problems in processing

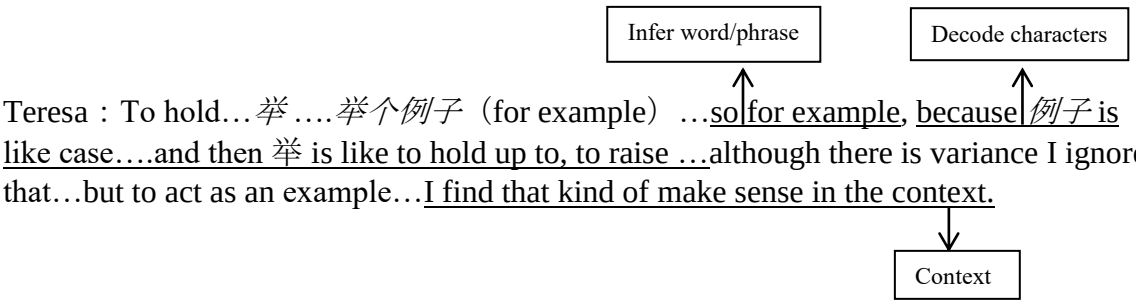
Chinese text.

Word/phrase inference: A simultaneous cluster and a hierarchical cluster. Out of 40 cases of successful word/phrase inference, 23 cases involved simultaneous use of context and character meaning. These data helped to reveal a critical strategy cluster CFL readers used to infer words/phrases (see Appendix E, Figure E1(a)). As Figure E1(a) illustrates, two sub-strategies, context and decoding characters, were used simultaneously to help readers apply a higher-level strategy, inferring words/phrases. The three strategies, context, decoding characters, and inferring words/phrases, constituted a simultaneous cluster. One example of this cluster was found in Maggie's reading:



In this example, Maggie did not know the meaning of the word *攀比* (to compete with others). By recalling the meaning of one constituent character *比* (to compare, compete) and context, she successfully inferred the meaning of this word.

Like Maggie, Teresa successfully inferred the meaning of a phrase with the help of character meaning and context, as the following think-aloud transcript shows:



As the transcript shows, Lisa successful recalled the original meaning of *举* (to raise or hold up), and with context cues she understood the whole phrase accurately.

Sometimes CFL readers used a sub-strategy, mental lexicon (the vocabulary that the learners already know), to figure out the meaning of constituent characters, with which they successfully inferred the meaning of a word or phrase. As Figure E1(b) (see Appendix E) shows, the three strategies (inferring words/phrase, decode characters, and mental lexicon) constituted a hierarchical cluster. It occurred nine times. One example is provided below:

Xiaohua: *一般只求良好* (they only strive for being ok)…*求* (strive for) reminds me of *要求*(requirement/expectation), so expectations.

Mental lexicon

Decode characters

Xiaohua was not familiar with *只求* (to only strive for), but she recalled a known word *要求* (expectation/to expect) with the same character *求*. Based on the meaning of *要求* (expectation/requirement), she decoded the meaning of *求* (expectation/to expect) correctly and her final recall indicates that she inferred the phrase *只求良好* (to only strive for being ok) correctly: "the majority of American students choose to only do just enough to be average."

Similarly, in the following example, Peter activated two known words to decode two characters in a new word and inferred the word meaning successfully:

Peter: *碰撞* (*collide*) means like …both means bump into or crash into.
Researcher: How do you guess that?
Peter: I have seen it before, like *碰倒* (*knock down*) and then like *撞车* (*crash*). So bump into, crash into…Two cultures bump together, maybe.

Decode characters

Infer word/phrase

Mental lexicon

In this case, Peter accessed two known words *碰倒* and *撞车* to decode the meaning of the two characters *碰* and *撞*. Once he was sure that both characters mean "bump into" or "crash into," he successfully inferred the word meaning in the sentence: "Two cultures bump together, maybe."

Monitoring: A simultaneous cluster, a hierarchical cluster, and a pair. Effective monitoring happened 26 times when participants successfully detected inaccurate interpretations, adjusted their construction of meaning, or confirmed their previous inferences. The most frequent sub-strategy used to help monitoring was context, which happened 22 times across 26 cases of effective monitoring. In nine cases, context cues were used with translation or paraphrasing to help monitoring (see Appendix E, Figure E2(a)), as Linda's think-aloud transcript shows:

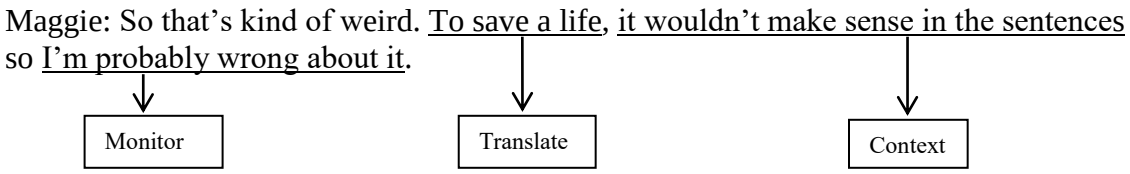
Monitor

Translate

Linda: *在这里我们不能一一举例* (Here we cannot list all examples) ...one by one example. This is not "one by one example". That's very strange thing to say here… em...Maybe I can't, I can't give an example for every difference, something like that.

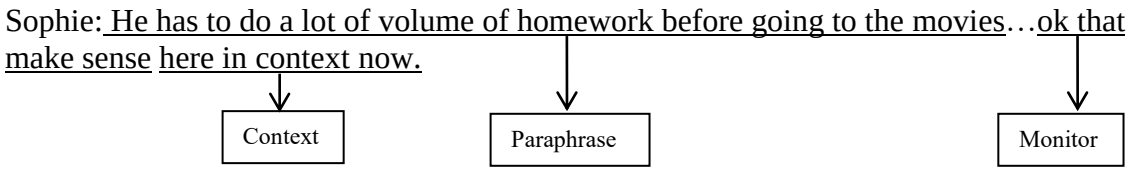
Context

Linda first translated the phrase *一一举例* as one by one example, but she immediately realized that it did not make sense in the context and reconstructed her interpretation. Like Linda, Maggie also used translation with context to monitor comprehension:



Maggie's first interpretation of *享受生活* (to enjoy life) was "to save a life." She immediately realized that this translation did not make sense in the context. Her recall protocol "Their first priority is to give children an enjoyable life" also indicated that she reconstructed her comprehension. In the interview, she explained that if a translated/paraphrased segment did not fit in the context, she would detect the miscomprehension.

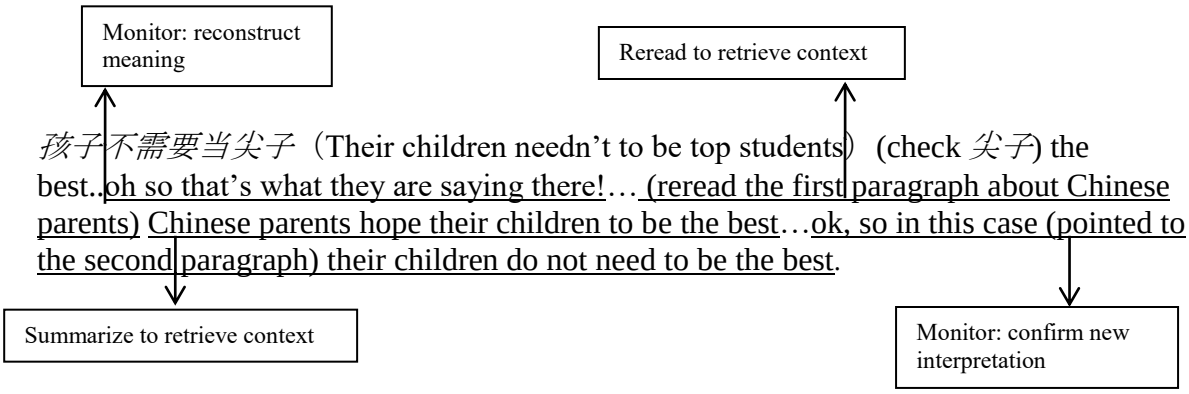
Like translation, paraphrasing was also used with context to monitor comprehension, as Sophie's think-aloud transcript shows:



In the example above, Sophie paraphrased the sentences. Finding that it fit the context assured her that her interpretation was correct.

Another strategy cluster related to monitoring is a hierarchical one (see Appendix E, Figure E2(b)) consisting of (a) a higher-level strategy (monitor), (b) a first level sub-strategy (context), and (c) two second-level sub-strategies (reread and/or summarize) used to retrieve context, especially global context. In some cases, rereading and summarizing co-occurred. This strategy cluster occurred eight times.

One sub-strategy that helped to retrieve context was re-reading, which occurred four times in successful cases of monitoring. Mingzhe's think-aloud transcript demonstrated how he used this strategy:

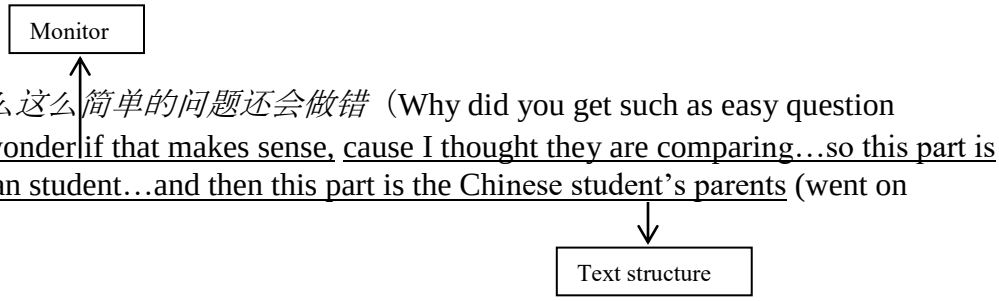


As the transcript shows, when reading the second paragraph, Mingzhe figured out a key word 尖子 (top students) by checking the dictionary. With the new information, he reconstructed his comprehension of the second paragraph, and checked it by rereading and summarizing the first paragraph. The global context in the first paragraph (Chinese parents hope their children to be the best) helped him confirm his new interpretations about the second paragraph (American kids do not need to be the best). Like Mingzhe, Maggie re-read the previous paragraphs several times; when asked about her reasons, she also emphasized the positive role of context: "I guess to get the context. Because when you reread stuff, then you notice different things, or you may remember things that you'd forgotten before. In the context, then it ends up making a lot more sense."

Mingzhe's transcript reveals summarizing as another sub-strategy used to access context. It was used five times in successful monitoring. As the example above shows, summarizing the first paragraph helped Minghze to grasp the previous context, which assisted him in constructing comprehension of the part he was reading. Like Mingzhe, Sophie twice summarized the main idea of a paragraph after she finished reading it. She explained in the interview that this sub-strategy helped her to keep track of the global context of the whole text:

> Sophie: …Because usually a paragraph is an idea…so I make sure that the ideas are actually connect with each other… Because if there is no link, it's probably that my comprehension fails somewhere.

Another sub-strategy paired with monitoring is text structure (see Appendix E, Figure E2(c)). As the selection below shows, text structure helped Teresa to check and confirm her comprehension.



As the transcript above shows, Teresa first questioned her interpretation about a sentence in the third paragraph. Thus, she checked if her comprehension was consistent with her awareness of the text structure (making comparison). After confirming that they were consistent, she continued to read. Her recall protocol ("Why did you get such a simple question wrong?") also supported the conclusion that she understood this part correctly.

Another participant, Jack, also mentioned using text structure to confirm his hypotheses about the text:

> Jack: …It's the beginning, and compare and contrast, and it's about education and Chinese parents. Then this stuff… Okay. They're comparing, and it'll verify, Okay. It is compare and contrast. I'll be like, "Okay. Chinese parents are strict; American parents not so much." Then down here ... Okay. It verifies that it's compare and contrasting, and Chinese parents are strict, verify that American parents aren't as strict, then gives some example.

As the transcript above shows, Jack was clearly aware of the macro-structure (compare and contrast) of the text and the micro-structure of a paragraph (main point and examples). His text structure awareness helped him to monitor comprehension by integrating information from different parts of the text.

Segmenting words: Three pairs. Chinese compound words can consist of one, two or multiple characters, and there are no boundaries between words. Due to this unique orthographic characteristic, L2 learners of Chinese, especially those at lower proficiency levels, usually have difficulties identifying whether a combination of characters is a compound word or not. Among the 12 participants in this study, six participants had problems segmenting words while they were reading the Chinese text.

As shown in Figure E3 (see Appendix E), checking the dictionary, accessing mental lexicon, and using grammar knowledge were the three sub-strategies paired with segmenting words. In six cases of effective use of this strategy, both dictionary and mental lexicon were referred to twice and grammar analysis was conducted once.

Thanks to modern technology, Chinese learners can segment words by typing the unknown combinations of characters into mobile phone applications using Pinyin or handwriting. If their electronic Chinese dictionary does not find any related items, they know this combination is not a word. In terms of identifying words, heritage learners had one advantage: they did not need to check the dictionary but instead relied on their mental lexicons, which were developed from family language input. Xiaohua was one of these heritage learners. She used her mental lexicon with the following example:

> Xiaohua: 父母可能会以 (Chinese parents may use … as) … 会以 (will use something as) … I never heard of that.

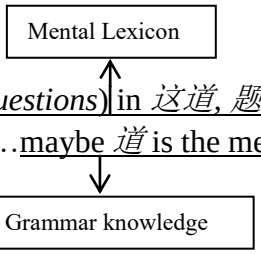
This is a part of a longer sentence. 会 means "be going to/will". 以 is combined with the subsequent characters with the meaning of "use…as". As a heritage learner, Xiaohua and her family members spoke Chinese at home. She naturally checked her mental lexicon but failed to

link *会以* (will use something as) with any of the words she had heard. Skeptical that these two characters went together, she went on reading to get more context cues and finally understood this long sentence.

Grammar analysis was another strategy CFL readers used when they encountered word decision problems. In the interviews, several participants (Sophie, Maggie, Angela, and Mingzhe) emphasized the important role of grammar knowledge in segmenting words:

> Angela: Yeah I used to have that problem (in identifying a word) …but now that I'm learning to identify the parts of the sentences…it's becoming a little easier to decide.
>
> Mingzhe: A lot of it comes down to grammar and using what characters I do know to figure out some sort of sentence structure

In one case, a reader used two sub-strategies simultaneously to segment words, as the following transcript shows:



> Mingzhe: *道题*…it's like *道* (*the measure word for test items/questions*) in *这道, 题* (*this item*) as in *问题*(*question item*)…but I don't know…*道题*…oh…maybe *道* is the measure word.

Mingzhe used his mental lexicon (e.g., *这道* and *问题*) to figure out the meaning of the two characters *道* and *题*. His grammar knowledge helped him to identify that *道* was used as a measuring word and *题* was a noun by itself. In this case, he used both his mental lexicon and grammar knowledge to segment the word.

Results of the study revealed several clusters and pairs CFL readers used to infer words and phrases, monitor comprehension, and segment words. The next section discusses implications of these findings for L2 reading theories, instruction of Chinese reading, and future research.

Discussion

L2 reading researchers have been interested in identifying reading strategies that facilitate reading comprehension (Block, 1986; Hosenfeld, 1977, 1984; Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989; Trabasso & Bouchard, 2002). However, although researchers have suggested that successful strategy application usually involves more than one strategy (Block, 1986; Grabe, 2009; Pressley & Harris, 2006; Sheorey & Mokhtari, 2001), few studies have investigated how strategies interact with each other to enhance comprehension. This study extends previous research by revealing that successful comprehension was attributed to the strategies used in pairs and clusters, which involve one or multiple levels of sub-strategies contributing to primary, higher-level strategies. For example, CFL readers reread previous passages to retrieve context. Using context, readers can then monitor more effectively. However, it is not enough to simply state that monitoring, rereading, and context are effective strategies. To

better understand the use of L2 reading strategies, more research is needed to study how strategies are clustered and paired to help L2 comprehension.

This study identified several strategy clusters and pairs used by CFL readers. The simultaneous strategy cluster used to infer unfamiliar words/phrases (see Appendix E, Figure E1(a)) not only verifies the conclusion of a previous study (Huang, 2014) that character meaning and context are two word inferring strategies used by CFL readers, but also expands it by showing that combining these two strategies helps CFL readers infer words successfully. This identified cluster also supports the conclusion that both context and morphology information contribute to word meaning interpretation (Jiang & Fang, 2012). This result could be explained by Chinese morphology. More than 75% of Chinese words are compound words consisting of two or more characters, with each constituent character contributing directly to the meaning of the compound word (Lin, 1972). Many Chinese characters have multiple meanings, and when combined in different compound words, the meanings of a same character may differ. In addition, there are different levels of syntactic complexity and semantic transparency for compounding in Chinese (Ke, 2012; Packard, 2000). Therefore, determining the meaning of Chinese compounds is more complicated than a simple summation of each character's meaning and involves integrating multiple sources including context and character meaning.

Three strategy pairs found in the study were used to segment words. The sub-strategies CFL readers paired with word segmenting strategies were mental lexicon, dictionary, and grammar analysis. Similar to the results of a previous study (Shen, 2008), this study suggests that matching the target item to an existing item in the mental lexicon is a commonly used word decision strategy, and multiple linguistic cues (e.g. mental lexicon and grammar) help readers to make better decisions.

One essential sub-strategy which appeared in more than one strategy cluster is context. Context was mentioned in the L2 reading literature (Hosenfeld, 1977, 1984; Huang, 2014; Jiang & Fang, 2012; Shen, 2008) as an effective word processing strategy. This study validates and extends previous studies by demonstrating that context facilitates CFL readers' lower-level processing (e.g., word/phrase inference) as well as higher-level processing (e.g., monitoring).

This study supports the interactive model by showing that both bottom-up and top-down strategies (see Appendix C Table C2) were used in CFL reading and that lower-level processing (e.g., word recognition) were supported by strategies such as context cues and making inferences. It also confirms the Compensatory Model of L2 Reading (Bernhardt, 2011) by revealing the interplay of different components that contribute to reading. On the one hand, successful use of reading strategies (e.g., infer words/phrases) compensated for the weakness in L2 vocabulary knowledge. On the other hand, effective use of these strategies depended on sub-strategies (e.g., mental lexicon; character meaning; grammar knowledge) which are closely related to L2 vocabulary and grammar. In other words, this study showed that readers' L2 knowledge affects the effectiveness of their strategy use.

Although CFL readers used some top-down strategies (e.g., summarizing, text structure, and monitoring) in this study, most of the effective pairs and clusters relied more on bottom-up strategies than top-down ones (e.g., translate, mental lexicon, infer words/phrases, and segment

words). This finding, though differing in results from research with alphabet foreign language learners which suggested successful comprehension is mostly attributed to effective use of top-down strategies (Bernhardt, 2012; Grabe, 2009; Hosenfeld, 1977, 1984), points to a common conclusion suggested by previous CFL reading research (Everson & Ke, 1997; Lee-Thompson, 2008): due to the unfamiliar writing system and limited L2 linguistic knowledge, intermediate level CFL students have many difficulties with lower-level processing and have to rely largely on bottom-up strategies in reading. This result may suggest that, while in general successful strategy use may call for a more balanced interplay of strategy types, learners' self-organized strategies are greatly affected by factors such as linguistic knowledge and distance between their L1 and L2.

Two pedagogical suggestions are implicated by the study's results. First, this study demonstrates that, if used effectively, reading strategies compensate for comprehension gaps and successful strategy use usually involves orchestrating multiple strategies. Therefore, instructors can introduce a wide range of strategies and encourage learners to explore using and combining multiple strategies that work best for their levels. This process will help to improve learners' metacognitive awareness of reading strategies and their ability to self-organize strategies effectively. Second, this study suggests that L2 knowledge, such as vocabulary and grammar knowledge, plays an important role in L2 Chinese readers' use of strategies. Thus, instructors need to enhance readers' vocabulary and grammar knowledge, which in turn helps readers apply strategies effectively.

Although multiple measures, such as triangulations, peer reviews, and member checks, were used to ensure the validity and reliability of the study, the results may not be generalized to all L2 Chinese readers, due to the limited sample size and variables such as readers' age and proficiency levels. In addition, it should be accepted that some participants may have had difficulty verbalizing their thoughts during think-aloud tasks and there may have been factors that cause reactivity, although pre-task practice of think-aloud protocol and post-task interviews were used to improve the quality of this method and to triangulate the results.

The study suggests several directions for future research. Limited by the sample size and the setting, this study could not possibly reveal all effective strategy clusters and pairs used by CFL readers. It will be worth conducting more studies in different learning contexts to identify strategy clusters and pairs used by CFL readers, and testing with larger samples to see if these strategy groups correlate with better comprehension. Second, since readers' strategy choice is affected by their language proficiencies, further investigations are needed to explore how strategies are used by CFL readers of different proficiency levels and how their strategy use contributes to their reading performance. Third, this study has suggested that heritage learners may use resources that are not necessarily available to non-heritage learners (i.e., mental lexicon based on daily oral language input). Further studies are needed to compare the strategy use of heritage and non-heritage Chinese learners to reveal pedagogical suggestions for guiding different groups of learners. Furthermore, since the ultimate purpose of studying L2 reading strategies is to help L2 readers improve their reading, one topic worthy of investigation is the impact of reading strategy instruction on CFL learners' performances.

Conclusion

Through close observations, interviews, recall and think-aloud protocols, this study bridges gaps in previous literature about L2 reading by revealing effective strategy clusters and pairs that adult CFL readers at intermediate levels used to infer words and phrases, monitor their comprehension, and segment words. The results extend previous literature by demonstrating that successful reading usually involves multiple strategies clustered and paired in particular ways. This study also supports and expands the compensatory model of L2 reading proposed by Bernhardt (2005, 2011) by revealing the interplay of strategies and L2 knowledge. More research about L2 Chinese reading, reading strategies, and strategy instruction are needed to provide better understanding of L2 reading as well as CFL reading, and to yield useful pedagogical implications to improve the L2 Chinese reading curriculum.

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Appendix A

Reading Text and Translation

中国家长和美国家长

中国家长往往比美国家长要严格得多。他们愿意为孩子提供最好的条件并希望他们成为尖子。在中国文化里，良好是不够的。正像一位中国家长说的那样：每个人都可以做到“良好”，但是应该做得比“良好”更好，要当尖子就要付出更大的代价。

和中国家长不一样，很多美国人的信条是：生命是短暂的，要充分地享受它。美国家长们也为孩子提供最好的条件，但是他们的第一原则是让孩子享受生活，让他们活得充实、丰富。对美国家长来说，良好就很好了，孩子不需要当尖子， 也不必和别人攀比。这就是为什么在美国文化里长大的学生一般只求良好，很少争尖子。

两种文化在发生碰撞的时候反差最为明显。举个例子，有两个学生，一个是中国学生，另一个是美国学生，他们都在数学考试中得了 99 分。美国父母听到消息，往往会满意，甚至会买些礼物奖励他的成绩。而大多数父母会责问 “怎么这么简单的问题还会出错？” 接着，他们会让孩子到自己的房间里去，把丢分的那道题再复习一遍。再举一个例子，中国学生和美国学生都想去看电影，但是中国学生要做大量的功课，即使做完功课，父母可能会以 “太晚” 或 “明天还要很早起床” 为理由而不让他们去。而美国父母往往会同意，并祝孩子玩得开心。

中美文化有很多方面的差异，在这里不能一一列举。中国父母对孩子期待更高，也更严格，而美国的父母对孩子要求不像中国父母那么高，管得也很宽松。很难说那种教育方式更优越，因为文化背景决定了教子方式。

Chinese Parents and American Parents

Chinese parents are usually much stricter with their children than American parents. They are willing to provide the best condition for their children and hope that they will be top students. According to Chinese culture, to be “good” is not good enough. As a Chinese parent said: “Everybody can be good”, you should be even better than good. And you need to work hard and pay a lot to be the top.

Unlike Chinese parents, most American parents believe that life is short and people should fully enjoy it. American parents also provide best condition for their children, but their first principle is to allow children to enjoy life, and make them live to the fullest. For American parents, to be good is enough and their children don’t need to be the top one, and there is no need to compare and compete with others. That’s why most children growing up in American culture seldom strive to bet the top students, and they usually only work to be “good”.

When two cultures collide, the differences become very obvious. For example, two students, one Chinese and another American, both got 99 points on their math test. American parents will be satisfied, and they may even buy gifts as reward for their child. On the contrary, most Chinese parents will ask: “Why did you get such an easy question wrong?” Then they will urge their child to go back to his/her bedroom and review the item he/she missed. Here is another example. Both students want to watch a movie. But the Chinese student needs to do lots of homework. Even if they finish the homework, their parents will use reasons like “it’s too late” or “you need to get up early tomorrow” and persuade the child to stay home. American parents usually allow their children to go and wish them a good time.

There are lots of differences between American and Chinese culture, and we cannot list them all here. Chinese parents have higher expectations for their children and thus are stricter with them. American parents' expectations are not as high as those of Chinese parents, and they don't restrict their children too much. It's hard to say which way is superior, because cultural backgrounds determine people's way of raising children.

Appendix B

Interview Questions

Background as readers

1) What is your major? What year are you in your undergraduate/graduate study? How many years have you studied Chinese? Do any of your family members speak Chinese? What is/are the languages you speak at home? Have you ever gone abroad to study Chinese? Have you learned other foreign languages in addition to Chinese? How do think of your overall proficiency in Chinese compared with other students. Please rate from 1–5 (1: very poor; 5: outstanding)
2) Do you think of yourself as a good reader in Chinese? You can rate using five-point scale. Why do you think so? How about in English?
3) If you had to describe reading Chinese to someone who has never read it, what would you say? What do you think are some important characteristics of a good Chinese reader?
4) How would you explain how you read in Chinese? Are there any differences in the ways you deal with Chinese texts and English texts? If yes, can you describe more about these differences?
5) Has your Chinese teacher taught reading strategies in class? If yes, are they helpful? What kind of reading activities do you usually do in your Chinese class? What do you think about them? Do they help improve your Chinese reading?
6) What kind of things do you usually read in a normal week or month? In what languages?

Reading strategies and difficulties

1) What are some difficulties you usually have when reading Chinese texts? What do you do when you have these difficulties? Does that work?
2) What do you usually do when you encounter unknown words when reading Chinese texts? How does that work? Can you give me some examples? Are there other things you do?
3) I noticed that when reading this text, you checked the dictionary occasionally. While reading Chinese texts, when do you usually check the dictionary? Is the dictionary usually helpful? Do you remember any case when it is not helpful? If it does not work, then what do you do?
4) Unlike English, there is no boundary between Chinese words; thus, some students have problems in identifying words. How do you feel about word segmentation? Is it usually a problem for you? Suppose you are not sure if a combination of characters is a word. What would you do? If not, what do you think are the reasons for that?
5) *You mentioned that grasping the main idea is very helpful for your comprehension. Could you explain how do you usually grasp the main ideas? Can you give me some examples?
6) *You mentioned that context usually helps you to understand. Can you explain more about your definition of context? Could you explain more about when do you usually use context? Can you give me some examples in which context helped you? Does it always help? Are there occasions when it does not work? Some examples?
7) *I noticed that you correct yourself multiple times when you read this text. Could you explain what makes you do that?
8) Do you usually check your understanding when you are reading in Chinese? How do you check your understanding? Some examples?

9) Do you always follow the same process when reading Chinese? If not, what factors affect your choice of procedure?
10) Could you provide a list of Chinese reading strategies you use a lot? What reading strategies do you think are especially helpful to your Chinese reading? Could you explain the reasons?
11) Overall, do you think you are good at using strategies to facilitate reading Chinese texts? Why do you think so? Please rate using the five-point scale.
12) How did you learn the reading strategies you usually use?

Other questions about the present study

1) How hard was the text to understand? Please rate the difficulty level based on five-point scale (1: very easy; 5: very difficult).
2) What do you think about the think-aloud procedure? Did it seriously change your reading process and strategy use? In other words, without thinking aloud, will you go through the same reading process and apply the same reading strategies as you do when thinking aloud?

* indicates optional questions which were asked when strategies in these questions were used or mentioned by the participants.

Appendix C

Table C1
Participants' Demographic Information and Learning Experience

Name	Degree in progress	Gender	Family language	Chinese learning experience	Other foreign languages	Study abroad
Maggie	MA in Linguistic Anthropology	Female	English	2.5 years at college	Spanish	Twice
Sophie	BA in Chinese and Pre-medicine	Female	French	4 years in high school; 2.5 years at college	English, Spanish, German, and Tahitian	Once
Jack	BA in Marketing	Male	English	2.5 years at college	Spanish and French	Once
Xiaohua	BA International Studies	Female	Cantonese	3 years in preschool; 2.5 years at college	Spanish	Once
Peter	BA in Computer Engineering	Male	English	Self-study online for 8 months; 1.5 years at college	Swedish and Spanish	Once
Angela	BA in Biochemistry and Chinese	Female	English and a little Laotian	2 years at high school; 1.5 at college	French and Spanish	Once
Albert	BA in Economy	Male	English	1.5 years at	Spanish and	Once

	and Chinese			college	German	
Yuting	BA in Accounting	Female	Cantonese	2.5 years at college	French	No
Lingling	BA in Spanish and Pre-pharmacy	Female	Mandarin	A couple of year at Sunday school; 2.5 years at college	Spanish	No
Mingzhe	BA in Biomedical Engineering	Male	Mainly in English	4 years in high school; 2.5 years at college	Spanish	No
Teresa	BA in Finance and International Studies	Female	Mainly in Cantonese	3 years in high school; 1.5 years at college	French	No
Linda	MA in Speech Pathology	Female	Mainly in English	2.5 Years at college	Spanish	Once

Table C2
Strategies Used by CFL Readers

Groups	**Codes**	**Coding descriptions**	**Examples**
Bottom-up Strategies	Mark	Mark (underline, circle, etc.) certain part of the text	攀比
	Dictionary	Check the dictionary to get information about a character or word	Not sure about this one…I gonna check it.
	Write notes	Write down notes, such as Pinyin, English translation and summery of certain passages	a. Ok, 愿意… (wrote down "be willing to" beside the word) b. Chinese parents are strict, when the score is 99, not happy (wrote down Chinese parents strict—99 not happy) in the margin of the paragraph.
	Decode characters/ words	Try to recall the meaning of specific characters or words	I know 举例 is like for example, and 再 is like again
	Infer words/ phrases	When encountering comprehension obstacles (e.g. unknown words, unfamiliar syntactic structure, etc.), the reader try to infer about certain word and phrases	a. Maybe sharp…like English says sharp…like smart. b. So maybe the idea is like being good is not enough, you have to make some sacrifice on yourself, some cost to yourself.

	Translate	Translate one or more sentences word by word	Every person...can do good... but should do... compare to good… even better.
	Context	Use the context to help comprehend the text or monitor one's comprehension of the text	And so in this context, it makes more sense to say that you are not expected to be comparing with others cause life is not trying to be perfect.
	Paraphrase	Use one's own words to explain the meaning of one or a couple of sentences	争..war…compete….to strive…to fight…Ok…so American people are ..less competitive.
	Reread	Reread certain part of the text, such as a sentence or multiple sentences to comprehend the text better	Ok...在这里不能一一举例...在这里不能一一..
	Mental lexicon	When encountering an unfamiliar compound word, the reader activates an item in his/her mental lexicon which contains the same character that constitutes the unfamiliar word. This strategy is usually used when the reader needs to infer the meaning of an unfamiliar character or word	宽松…I think this is 松..like in 轻松
	Repeated word	Pay special attention to repeated unknown words	oh this word again…I gonna check it
	Grammar knowledge	Use grammar knowledge to facilitate comprehension	that's probably like 吃完..it's like the complementary…so I'm just gonna focus on the first part of the verb.
	Identify word	Try to decide whether a combination of characters is a word or not	I don't think the 少 is a part of word.
	Radical	Use the cues provided by radicals to infer or recall the meaning of a character or word	What's this? 小 and 大, ok, 尖。
Top-Down Strategies	Skip	Skip an unknown part of the text (a word, phrase or sentence) and go on reading	生命是短…something的, 应该…

Monitor comprehension	Consciously monitor one's comprehension by correcting himself/herself, questioning, confirming or rejecting his/her previous inferences	Em...something is not making sense. So... mom and dad are not the same. I'm not sure whether that's really the right way.
Identify problem	Identify problem that hinders his/her comprehension	a. I lost the trace of thought even though I'm reading b. I only know 6 words in this sentence and I don't know the main verb of this sentence
Summarize	Use one's own words to summarize a larger part of the text (e.g., a paragraph or multiple sentences)	Ok after I just read through it once…just to get the general idea… of what the paragraph is about… and this one is about Chinese parents and American parents... their thoughts about their children and education…
Important information	Filter important part (e.g. a character, word or sentence) from less important one. This strategy is usually followed by other strategies such as checking the dictionary, rereading and skipping	a. This is important so I'm going to check. b. I don't feel like this word…I don't' feel like it affect my comprehension
Plan	Consciously make decision about what he/she is going to do based on the given situation	I still understand like he has to do a lot of things before going to the movie... so I'm just gonna skip it…if I have a lot of time I may come back.
Title	Read the title to get the general idea of the article	Title, let's see..中国父母和美国父母 So it's about Chinese parents and American parents.
Prior knowledge	Use the personal experience and knowledge to help understand the text	you have to make some sacrifice on yourself, some cost to yourself to...just thinking about Chinese culture, maybe a sacrifice on your part to improve the family's well-being.
Foreshadow	Predict the content of certain part of the text or the whole text before reading them	So this is Chinese parents and American parents. And I assume it's gonna be a comparison of the two kinds of parents.

	Text structure	Analyze the structure of the text and the main ideas of more than one paragraphs to get the logic of the author's argument	So this part is the American students'parentsand then this part is the Chinese student's parents…
	Scan	Scan part of the text quickly to filter unknown words, which will be checked later	中国父母比美国父母要严格得多。她，愿意为孩子提供最好的条件（underline two unknown words and go on reading the rest of the paragraph）
	Evaluate	Evaluate the text content or the author's views by giving comments	Say I don't think this is true. You see that American adults are competitive and American culture is extremely competitive.

Appendix D

Sample Cases of Successful Use of Strategies

(1) Solve comprehension difficulties
To hold...*举*....*举个例子*（for example）…so for example, for *例子* is like case….and then 举 is like to hold up to, to raise …although there is variance I ignore that…but to act as an example…I find that kind of make sense in the context. (infer words or phrases/decode characters/context)

(2) Detect misinterpretations of the text
So that's kind of wired…to save a life, it wouldn't make sense in the sentence so I'm probably wrong about it. (context/monitor/translate)

(3) Correctly adjust or modify comprehension
I'm thinking this *尖子*（top students）is not point but more like perfection or it might be a colloquialism or just because my dictionary does not have its meaning in this context (monitor/context).

(4) Confirm or reinforce correct interpretation/inferences
OK. So cultures collide. That makes sense. Alright cultures collide and the differences become apparent. That makes total sense (monitor/context/translate)

(5) Enhance overall comprehension of the text
中国父母和美国父母（Chinese parents and American parents）So this is Chinese parents and American parents. And I assume it's going to be comparison of the two kinds of parents. (title/foreshadow/translate)

Appendix E

Figures: Effective Strategy Clusters and Pairs Used by CFL Readers

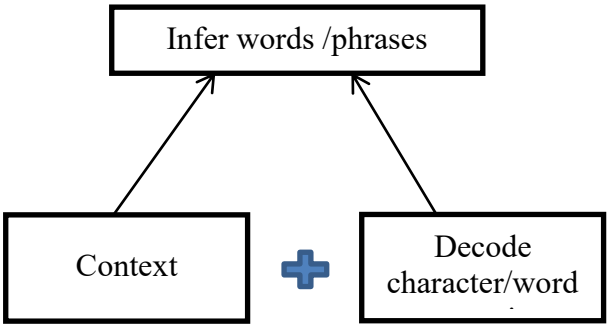

Figure E1(a). A simultaneous cluster used to infer words/phrases

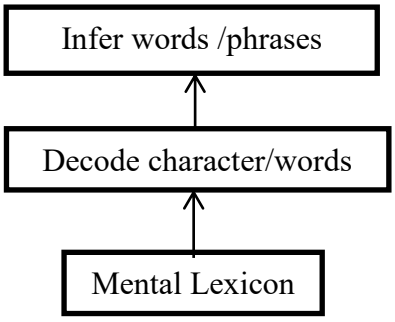

Figure E1(b). A hierarchical cluster used to infer words/phrase

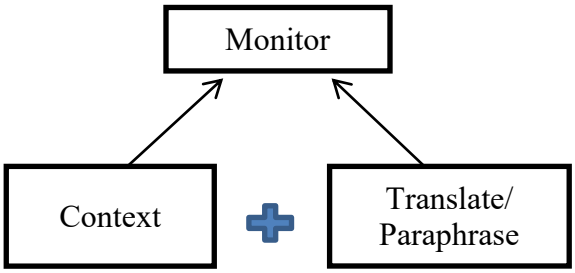

Figure E2(a). A simultaneous cluster used to monitor comprehension

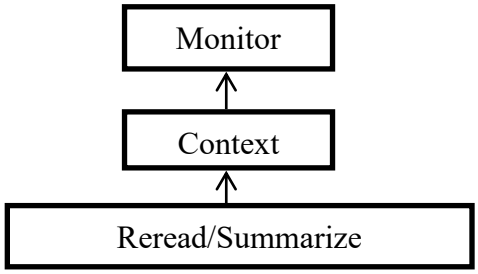

Figure E2 (b). A hierarchical cluster used to monitor comprehension

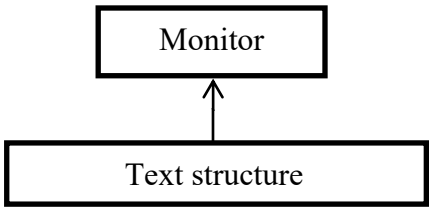

Figure E2(c). A strategy pair used to monitor comprehension

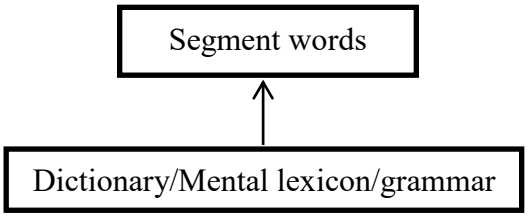

Figure E3. Three word segmenting strategy pairs

About the Author

Sha Huang serves as Assistant Professor in the Department of Foreign Languages at Kennesaw State University. Her research interests include reading, language learning strategies, pedagogy, and material development.