ABSTRACT

Title of Document: A MULTI-METHOD DESIGN TO INVESTIGATE THE ROLES OF READING STRATEGY USE AND READING INTEREST IN COMPREHENSION OF ENGLISH EXPOSITORY TEXTS FOR EIGHTH GRADERS IN THE EFL CONTEXT

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This study aimed to address three research gaps revealed in previous studies on L2 reading comprehension and L2 reading strategy use: (a) a restricted use of methodology in assessing L2 reading strategies, (b) inadequate attention to the role of reading interest in L2 reading comprehension, and (c) a lack of comprehensive understanding about the relationships between reading strategy use and reading interest in L2 reading.

A multi-method design was adapted to assess L2 reading strategy use and L2 reading interest. The assessment methods for strategy use included think-aloud

protocols and a L2 reading strategy questionnaire, *the Cognitive-Metacognitive Strategy Questionnaire*. To quantify the data from the think-aloud protocols, three scoring procedures were developed based on the frequency counts of the strategy coding system: (1) *Quantity of Total Strategy Use*, (2) *Quality of Total Strategy Use* and (3) *Sophistication of Strategy Use*.

In addition, the readers' reading interest was measured by semi-structural interviews and two interest scales: the *Situational Interest Questionnaire* and the *Interest Experience Scale*. Based on the multiple assessments with 36 participants, the study examined (1) the specific L2 reading strategies employed by eighth graders in Taiwan and how the results from different strategy assessments corresponded to each other, (2) the sources for L2 reading interest for the eighth graders, and (3) how L2 reading strategy use and reading interest interacted with each other to influence L2 reading comprehension.

The results indicated that the L2 readers utilized three clusters of reading strategies during comprehension: (1) textbase comprehension strategies, such as translation and paraphrasing, (2) situation model construction strategies, such as elaboration, summarization and drawing inferences, and (3) metacognitive monitoring strategies. The study also found that the measure, *Sophistication of Strategy Use*, had the most satisfactory validity among the strategy measures. The

degree of sophistication in strategy use was more associated with the readers' text

recalls than the quantity of total strategy use, indicating how the readers intentionally

and carefully processed each strategy played a significant role to improve reading

comprehension.

Moreover, the study found several content characteristics which had positive

influences on L2 readers' interest in the text; they were relevance, importance,

novelty and familiarity of the ideas contained in the text. Furthermore, the case

analyses on three readers' profiles showed that reading interest was closely related to

the depth of the readers' strategic engagement. The less proficient L2 reader, Alice,

possessed high reading interest and demonstrated an attempt to employ more

higher-order, situation model construction strategies during reading. By contrast, the

proficient L2 reader, Stella, did not intend to comprehend the text in depth and

utilized the strategies at the superficial level due to her low reading interest in this

task. These findings presented a dynamic picture of the intertwined relationship

between strategy use and reading interest in L2 reading comprehension.

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Dedication

The success of this dissertation is dedicated to:

My father, Yanger Lin (林坤陽), my mother, Hsiu-Ching Shen (沈秀卿), and my

younger brother, Ying-Liang Lin (林盈良),

who always support my dreams,

and

my husband, Chen-Wee Jiang (江正瑋),

who always stands by me with selfless love.

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CHAPTER ONE: INTRODUCTION

How to read, comprehend and learn information from English texts is one of the most significant issues in EFL (English as Foreign Language) or ESL (English as Second Language) education. In EFL contexts where learners do not need to use English for daily communication outside the classroom, English is used mostly for academic purposes (EAP), such as reading textbooks and writing conference papers, or for occupational purposes (EOP, Carkin, 2005), such as reading manuals and writing business letters. Among these English reading materials, expository texts are the most common genre used to convey information, concepts and ideas (Chambliss & Calfee, 1998). EFL students encounter this genre frequently when reading across different content areas. For learning from reading to happen, students need not only to understand the literal meaning of the text, but also enact various cognitive processes to integrate the information in the text with their prior knowledge (e.g., Kintsch, 1998; Alexander, 1998; Bernhardt, 1991). Hence, developing strategic competence to comprehend expository texts is essential in EFL education. This dissertation aims to understand this strategic process of reading English expository texts for EFL learners through a multi-method design. Moreover, to understand how to sustain and keep readers engaged with the strategic processes in L2 reading, the study also includes a focus on one affective factor, reading interest. This dissertation intends to simultaneously examine language (L2) readers' strategic processes and their reading interest in order to better understand the influences of these factors on L2 reading comprehension.

This introduction starts with the rationales for conducting this study. Then, the background about the current English reading instruction in the research setting,

Taiwan, will be described. In the third section, the theoretical framework of this study will be offered. What follows are the statement of purpose and the three research questions. The section of research design introduces the multi-method assessment. Then, the limitations and the definitions of the key terms are provided.

Rationales

There are three general rationales for this dissertation: (a) the importance of understanding self-regulated strategies to read L2 expository texts for EFL/ESL learners, (b) the need for rigorous assessment designs in L2 reading strategy research, and (c) lack of attention to the affective factors in L2 reading comprehension. I will explain each part of the rationale here.

The Importance of Understanding Self-regulated Strategies to Read L2 Expository Texts for EFL/ESL Learners

What are the essential skills students need to develop to comprehend an expository text written in a second language? According to Cummins' theory (Cummins, 1979a; 1979b) on language acquisition, the ability to read academic texts is one of the language competencies in CALP (Cognitive Academic Language Proficiency) as opposed to BICS (Basic Interpersonal Communication Skills). CALP refers to formal academic learning, including listening, speaking, reading, and writing about subject area or content materials. This ability not only requires the understanding of basic vocabulary, but also a repertoire of comprehension strategies to know how to compare, classify, synthesize, evaluate, and infer. Numerous studies on reading comprehension and reading strategies also show that successful readers employed more text-related strategies and metacognitive strategies, such as planning, organization, evaluation and monitoring (e.g., Cohen, 1998; Kintsch, 1988; Phakiti,

2003, 2005). Therefore, beyond the skills of decoding L2 words and sentences, the knowledge and ability to use different reading strategies for L2 expository reading should have a close relationship with successful reading comprehension. Presently, there is little L2 reading strategy research that addresses the reading process of expository texts for beginning L2 learners (e.g., Chuang, 2007; Block, 1992). Future studies should be done to increase our understanding of the reading strategies that characterize competent readers for this group of learners to better inform teaching practice in strategy instruction.

The Need for Rigorous Assessments to Sustain Theoretical Development in L2 Reading Strategy Research

In Chapter Two, I present a review on L2 reading strategy research, from which I note an inadequate strength in these studies to expand our understanding about L2 readers' strategic processes during comprehension. One major reason is the restricted use of assessment techniques for strategies, which in turn limits the extent of interpretations about the results. Most of the studies used either strategy questionnaires or think-aloud protocols with interviews as the major strategy assessments. The studies which used strategy questionnaires tended to take a *priori* perspective by constraining readers' strategic processes into a collection of several reading strategies. However, the validity of using self-report questionnaires to measure strategy sue has been highly questioned (Veenman, Prins, & Verheji, 2003; Veenman, Bernadette, Van Hout-Wolters, & Afflerbach, 2006; Razavi, 2001; Desoete, 2008). On the other hand, the think-aloud studies analyze readers' verbal protocols during reading in an exploratory fashion and use various coding systems which render sometimes incomparable results.

According to the three-pronged approach on text processing by Magliano and Graesser (1991), conclusions about reading comprehension could be best drawn if the research includes (a) a detailed theoretical analysis of the expected reading processing, (b) a collection of on-line verbal data, and (c) a collection of behaviors measures, such as memory of text. This approach points out the importance of connecting theories with assessments and also underscores the necessity of adapting different measures for data triangulation to ensure a valid argument about reading comprehension.

Nowadays, multi-method design has been regarded as a more accurate assessment to capture learners' cognitive and metacognitive processes. For example, Veenman et al. (2006) strongly promote the use of multi-method design to assess individuals' metacognitive skills. According to them, the multi-method assessment should be comprised of on-line process measures, such as verbal reports in combination with other off-line measures, such as retrospective interviews or outcome assessments.

This type of multi-assessment studies, in effect, is not common in L2 reading strategy research. In the field of language learning strategies, a variety of research methods have been recommended, including retrospective interviews, strategy questionnaires, color-coding techniques, think-aloud elicitations, introspective interviews, stimulated recalls, classroom observations, e-journals, diaries, computer-trace strategy logs and eye movement tracking (Oxford, 2009; White, Schramm, & Chamot, 2007). These research methods have been applied sporadically to research L2 reading strategies. Without rigorous assessment designs, it would be hard to apply the research results to inform the theories of L2 reading comprehension

at a substantial level.

In a review of strategy literature by Alexander, Graham, and Harris (1998), they clearly stated that "Researchers must find more creative and effective ways to gauge students' strategic processing *in situ—ways* that allow us to glimpse the inherent interplay of cognitive, motivational, and contextual forces" (p. 149). These arguments signify a need to refine the methodology for strategy research. Hence, it is worthwhile to start a more comprehensive methodology to investigate L2 reading strategies and initiate the process of "reinstatement" (Alexander et al., 1998, p.150) for L2 strategy research.

<u>Lack of Attention to the Affective Factors in L2 Reading Comprehension</u>

Reading an expository text in a second language is not an easy task. From the discussion above, it can be seen that L2 reading comprehension is a highly sophisticated mental activity that interweaves various cognitive processes and requires substantial strategic knowledge. However, is this comprehension process only a cognitive enterprise per se? In addition to the information-processing paradigm, current research on literacy development of English language learners start to draw attention to the impacts of sociocultural factors on L2 reading comprehension, including discourse/interactional characteristics, family influences or state or federal policies (e.g., August & Shanahan, 2006; Bernhardt, 2003). However, this strand of studies is still at the nascent state and "reflects a shortcoming in the research with studies tending to be descriptive rather than documenting empirical links…" (August& Shanahan, 2006, p7).

Likewise, the influences of affective factors, such as readers' desire to learn, interest in reading, and engagement toward the whole process, also remain

unaccounted for in L2 reading comprehension (Lin, 2009; Bernhardt, 2003; 2005). According to Bernhardt's (2005) historical literature review on the development of L2 reading, half of variance of L2 reading comprehension still remains unexplained. She concluded that prior studies tended to focus on linguistic variables, such as grammar knowledge and vocabulary, and failed to address non-linguistic variables, such as comprehension strategies, engagement, content and domain knowledge, interest, and motivation. Among these variables, the role of affect stands as a significant issue that has not yet been well-researched.

Lately, the field of self-regulated learning (SRL) has drawn attention to the role of affect during learners' cognitive process in learning. Pintrich, Marx, and Boyle, the major researchers in SRL, asserted that conceptual change is not a "cold" or "overly rational" process (Pintrich et al., 1993, p.167), but should be fueled with readers' personal engagement and positive motivation. Hence, I want to base this study on a SRL framework that goes beyond cold comprehension to understand how one of the affective factors, reading interest, influence L2 learners' reading comprehension.

Research Context: English Reading Instruction in Junior High Schools in Taiwan

Like other EFL contexts where English is not spoken in daily life, English, in junior and high schools in Taiwan, is viewed as a required school subject, rather than a communicative tool. Therefore, most English classes focus mainly on reading and writing. The teacher-centered Grammar Translation Method remains a popular teaching method (Chuang, 2007) and teachers heavily rely on textbooks as the major instructional materials (Chan, 2003). When teaching a new text, teachers usually begin by introducing the vocabulary and explaining the grammatical rules being used

in the text. Then students are asked to practice the grammatical rules with the vocabulary by doing written exercises until they can memorize and construct correct sentences. Based on Chan's study (2003) on how junior high school English teachers utilize textbooks in class, the 252 participants indicated that writing, listening and grammar are the most common practices they do with the textbooks in class, while the text itself is least emphasized. The English texts in the textbooks are like a platform to present the targeted vocabulary and the grammar, instead of a body of meaningful information and knowledge for students to comprehend.

In addition, there are no adequate expository texts introduced to students in these English textbooks. To find out what kind of English texts are read by the majority of junior high school students in Taiwan, I did a content analysis on one of the most popular textbooks published by Nan-Yi (Chan, 2003). For the three-year, six-semester English curriculum in the junior high school, Nan-Yi develops six volumes of textbooks for each semester (Nan-Yi, 2009). These six textbooks contain a total of 98 English texts, including 50 dialogues, 34 narrative stories and 14 expository texts. This statistics imply that junior high school students in Taiwan only have limited input of expository texts from textbooks, which might affect their development in acquiring essential knowledge, reading skills and reading strategies to comprehend English expository texts. This deficiency might gradually hinder them from advancing to higher English proficiency, and decrease their motivation to read and learn from English textbooks in high schools and universities.

As for instructional practice, previous research has documented an inadequate focus on affective factors in reading instruction (Guthrie & Wigfield, 1999). Teaching practices which solely emphasizes students' learning at the cognitive level is more

pervasive in L2 reading instruction in the EFL context (Sheu, 2003). In Taiwan, the incorporation of motivational and interest elements into instruction is indeed missing (Wang, 2004). The main mission for most junior high school teachers is to prepare their students for a high-stakes standardized assessment, the Basic Competency Test for Junior High School Students, which every student will take in the 9th grade. The results of this test will determine whether the students can go to the most desirable high schools in their school districts. Consequently, English teachers do not have the luxury to design motivation-increasing reading activities for students and they rarely pay attention to whether students are interested in English reading or not. In addition, the most common reading comprehension assessment is multiple-choice questions as what are used in the Basic Competence Test. Inevitably, the emphasis on how students engage in reading English texts and how students can apply what they read to real-life situations is greatly overlooked (Yen, 2005). As a result, the English texts look "dry" to students as the content has no meaningful and intellectual appeal to them. To raise teachers' awareness of the importance of reading interest in English reading instruction, it is important to know what the specific interest sources are in the English text and how students' interest can contribute to reading comprehension. For this purpose, the relationship between reading interest and reading comprehension is one of the main topics in my dissertation.

Overview of the Theoretical Framework

The theoretical framework of this dissertation draws upon four different sources: (a) interactive approach of reading comprehension, (b) self-regulated learning (SRL) and the Model of Domain Learning (MDL), (c) L2 reading strategies, and (d) reading interest. These theories will be reviewed in more detail in Chapter Two. Based on

these theories, the study develops four theoretical assumptions about L2 reading:

(1) L2 Reading is an Interactive Process between Texts and Readers

This study takes an interactive perspective on L2 reading comprehension. The interactive approach focuses both bottom-up, text-driven processes and top-down, knowledge-construction processes during L2 reading (Bernhardt, 1991). Text-driven processes entail linguistic activities, such as recognizing words, syntactical structures, and text structures. Knowledge-construction processes require readers to enact different types of prior knowledge to interpret the text, such as domain knowledge and culture knowledge. In addition, this approach emphasizes how these two processes interact with each other to achieve L2 comprehension (Grabe, 1991; 2004). One L1 reading model which adopts the interactive perspective has been used to explain L2 reading comprehension, The Construction and Integration (C-I) Model (van Dijk & Kintsch,1983). This model suggests two different mental representations generated by readers when they are reading a text: a textbase model and a situation model. A textbase model is constructed by decoding and translating the linguistic input in the text into meanings, while a situation model is an elaborated and enriched understanding about the text through connecting the text to readers' prior knowledge. In terms of L2 reading comprehension, this model sheds great light on the interactive processes in reading. To construct a textbase model, L2 readers need to employ the bottom-up strategies to solve linguistic problems at the word or sentence level. To generate the situational model, top-down, higher-level strategies are also required to construct and elaborate meanings from the text by drawing on readers' prior knowledge or personal experiences. This process demonstrates complex reader-text interactions.

<u>(2) L2 Reading is a Self-regulated Activity</u>

Self-regulated learning (SRL) concerns not only what the cognitive processes are when learning takes place, but also how affect can sustain learning processes (Greene & Azevedo, 2007; Pintrich, 2004; Winne, 1995; Winne & Perry, 2000; Winne & Hadwin, 1998; Zimmerman, 2000; 1990; Zimmerman & Martinez-Pons, 1988). In general, SRL describes a form of learning, whereby students proactively set goals, select and use strategies, and self-monitor the effectiveness of their learning to attain the desired results (Zimmerman, 2008). SRL involves cognitive, affective, motivational and behavioral components that provide learners with the capacity to adjust their actions and goals to achieve desired results (Zeidner, Boekaerts, & Pintrich, 2000). In a word, self-regulated learners are highly strategic and motivated. They attune themselves to the relationships between their actions and the outcomes in social contexts in order to optimize their learning and academic performance (Zimmerman & Martinez-Pons, 1988).

A very successful and elaborated SRL model that draws cognition and affect together is Alexander's "Model of Domain Learning" (MDL, Alexander, 1997, 1998, Alexander, Jetton & Kuliokwich, 1995). The MDL especially addresses three factors in self-regulation: domain knowledge, strategic processes and interest. Another characteristic of the MDL is that it explicates a well-defined developmental sequence in a three-stage learning trajectory: acclimation, competence and expertise. Taken together, the MDL offers a longitudinal picture on the interactions among domain knowledge, strategic process and interest as learners advance from acclimation to competence, and finally reach expertise.

Fox and Alexander (2004) have applied the MDL to text comprehension and

explained what the MDL processes might be in text comprehension. At the beginning stage of acclimation, readers might only have limited domain knowledge and use surface-level strategies to initiate basic comprehension with temporary interest depending on the task contexts. Through exercising constant practice and receiving feedbacks from various reading experiences, readers gradually become more competent or even advance to expertise. At the stage of competence or expertise, readers are equipped with accumulated knowledge and deep-processing strategies. Also, they tend to regard reading as an abiding personal interest and express more intrinsic motivation for reading activities.

The implication from the MDL for L2 reading is that the reading process for an L2 text also demands L2 readers' self-regulation. This self-regulated process is greatly influenced by language knowledge, reading strategy use and reading interest. The three elements constitute inseparable, interconnected and evolving relationships during the course of achieving expertise.

(3) Proficient L2 Reading is Strategic Reading

The aforementioned theory, the MDL, has specifically explicated the importance of strategy use during reading. Reading strategies are defined as readers' deliberate, goal-directed attempts to control and modify their efforts to decode text, understand words, and construct meanings of texts (Afflerbach, Pearson & Paris, 2008). Previous research on L2 reading strategies used to take a "good language learner" perspective to compare the difference in strategy use between good L2 readers and poor L2 readers (e.g., Jimenez, Garcia & Pearson, 1996; Brantmeier, 2002; Chuang, 2007). Proficient L2 readers generally use more global and top-down strategies to achieve overall comprehension as reading a L1 text, such as generating main ideas, making

predictions, and elaborations. For the local problems at the textbase level, proficient L2 readers are also more capable of using different strategies flexibly and creatively with more perseverance than less proficient readers. In addition, reading strategies can be further categorized into cognitive strategies and metacognitive strategies (e.g., Chuang, 2007; Phakiti, 2003; 2008; Sheorey & Mokhtari, 2001). Proficient L2 readers demonstrate higher levels of metacognitive controlling and monitoring during their reading process (Phakiti, 2003, 2008). They are more aware of the presence of possible comprehension problems and pay more attention to the coherence of meaning across passages. These results indicate that the ability to use different reading strategies collaboratively plays an important role in reading comprehension, and this strategic process characterizes a proficient L2 reading.

(4) Reading Interest is an Important Motivator in L2 Reading

Reading interest is a key variable related to learners' affect in the MDL. In previous literature, reading interest has been termed as an " unique motivational variable" (Hidi, 2006, p. 69) and a "missing motivator in self-regulation" (Sansone & Thoman, 2005, p. 175). These descriptions indicate that interest is one important aspect of individuals' motivation. Other motivational concepts, such as task value, self-efficacy and achievement goals, tend to highly associated with individuals' beliefs and personal predisposition. By comparison, interest is characterized as a psychological state where readers demonstrate increased attention, amplified cognitive and emotional interactions and sustained effort in the ongoing work (Hidi, 1990; Ainley, Hidi & Berndorff, 2004). Hence, interest is more directly related to the contextual factors, such as reading topics or instructional activities, than the other motivational constructs. In other words, teachers could manage to increase students'

interest from external instructional design, which in turn helps strengthen students'

motivation and persistence. This pedagogical value is one important reason why I

chose to focus solely on the construct of interest in this study.

Interest is also deemed to be highly associated with cognition. According to Hidi

(1990), interest is "central in determining how we select and persist in processing

certain types of information in preference to others " (p. 549). This statement

describes how interest works as an attention filter to direct readers' attention to the

relevant information in the text for further cognitive processing. In L1 reading

research, the effects of reading interest on comprehension have been documented in

numerous empirical studies (See Hidi, 2006 for review). In L2 reading research,

Brantmeier's investigation (2006) also confirmed that L2 readers' perceived interest

and sources of interest significantly accounted for L2 reading comprehension.

Following Brantmeier's study, this study also addresses these two reading

interest: sources of situational interest and readers' perceived interest. Sources of

situational interest refer to the interestingness elicited by text characteristics, such as

ease of comprehension, cohesion, emotiveness and content familiarity. Perceived

interest refers to readers' actual experiences of interest feelings during reading.

According to the MDL, for readers who are still at the acclimation stage, this kind of

context-based interest should have closest relationships with reading comprehension.

Statement of Purpose

Based on the literature on L2 reading comprehension and the educational reality

of English instruction in the context of Taiwan, there are four problems I propose to

address in this study: (a) insufficient knowledge about what reading strategies young

students use to read L2 expository texts, (b) a restricted use of methodology in

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researching L2 reading strategies, (c) inadequate attention to the role of affect in L2 reading comprehension, and (d) a lack of comprehensive understanding about the relationships between cognitive factors, reading strategy use and affective factors, and reading interest, in L2 reading. This study intends to fill in these research gaps.

This study has four main purposes. First, the study examines the kinds of reading strategies that are initiated by eighth graders in Taiwan as they read an English expository text.

Second, the study adopts a multi-method design to assess L2 reading strategy use. As mentioned earlier, previous studies on L2 strategy use tend to employ either a qualitative method or a quantitative method as the only measurement. A combined method which includes various measures for strategy use is highly helpful for methodology development in current L2 strategy research. This study will use both on-line measures and off-line measures to assess L2 reading strategy use, including think-aloud protocols, retrospective interviews and a strategy questionnaire. The study will cross validate the data from these measures and examine their relationships.

Third, the study includes a focus on one rarely-addressed affective factor in L2 reading comprehension: reading interest. The study wants to explore the text-based sources of situational interest for L2 reading. In addition, the study will inspect how these sources of interest induce readers' perceived interest.

Fourth, the study aims to describe how reading strategy use and reading interest relate to reading comprehension. The study will investigate the influences from reading strategy use on L2 reading comprehension. Also, the effects of reading interest on L2 reading comprehension will also be analyzed. Taken together, the study

will compare the relative contributions of reading strategy use and reading interest to reading comprehension.

Research Questions

There are three major research questions guiding this study. The first research question is about what strategies L2 readers generally use to comprehend L2 expository texts. Using the multi-method assessment, the study will examine how the on-line concurrent measure (i.e., think-aloud protocols) relates to the off-line retrospective measure (i.e., questionnaires) in the assessment of L2 reading strategy use.

The second research question concerns with the role of reading interest in L2 reading comprehension. Two kinds of interest are addressed in this study: sources of situational interest and perceived interest. For sources of situational interest, the study will inspect what text-based factors make readers think this text is interesting. Furthermore, the study wants to understand how the sources of situational interest contribute to readers' actual feelings of interest.

The third question concerns with the relationships among L2 reading strategy use, sources of interest, perceived interest and L2 reading comprehension. The study is intended to determine how readers' strategic processes, sources of interest and perceived interest are related to their comprehension of the text.

To conclude, the specific research questions are as follows:

Research Question 1: What are the L2 reading strategies employed by eighth-graders identified from a self-report assessment and think-aloud protocols and how do the results from different assessments correspond to each other?

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Research Question 2: What are the sources of interest in L2 reading for eighth

graders and how do the sources of interest relate to readers' perceived

interest?

Research Question 3: How do L2 reading strategy use, sources of situational

interest and perceived interest relate to L2 reading comprehension?

Overview of the Research Design

I conducted a pilot study using think-aloud protocols and retrospective

interviews in 2009 in Taiwan. I used think-aloud protocols to assess reading strategy

use, and the retrospective interviews were the only instruments for understanding

readers' interest experiences. This pilot study recruited three low-achieving eighth

graders and three high-achieving eighth graders. All of the participants read two texts;

one text rated difficult and the other text rated relatively easier. I analyzed the

think-aloud data to compare the differences in reading strategy use between

high-achieving readers and low-achieving readers.

Based on the results of the pilot study, I employed a multi-method assessment

for L2 reading strategy use and reading interest as the research design for the formal

study. Figure 1.1 below provides a visual representation of the research design. The

multi-method assessment is a within-time design with different measurements. The

assessments for reading strategy use includes think-aloud protocols, the

Cognitive-Metacognitive Strategy Questionnaire (CMSQ, Phakiti, 2003; 2008*)*,

multiple-choice reading comprehension questions and text free recalls. For reading

interest, I will use retrospective interviews, the *Sources of Interest Questionnaire*

(SIQ, Brantmeier, 2006*)*, and the *Interest Experience Scale (IES,* Lin, 2010*)* to assess

sources of situational interest and perceived interest. This multi-method design will

collect both quantitative data and qualitative data. The details of the instruments, data collection process and data analysis will be offered in Chapter Three.

Figure 1.1. Illustration of the Multi-method Research Design for Assessing L2 Reading Strategy Use, Reading Interest and Reading Comprehension

L2 reading strategy use:
Think-aloud protocols
The *CMSQ*

- Qualitative analysis:
Coding scheme, classification matrix
- Quantitative analysis:
Inter-rater reliability
Pearson correlations, multiple regressions

Correlation examiniations

correlation examiniations

Reading i
retrospective interviews
The SIQ The IES

correlation examinations

Reading comprehension:
Multple-choice questions
Free text recalls
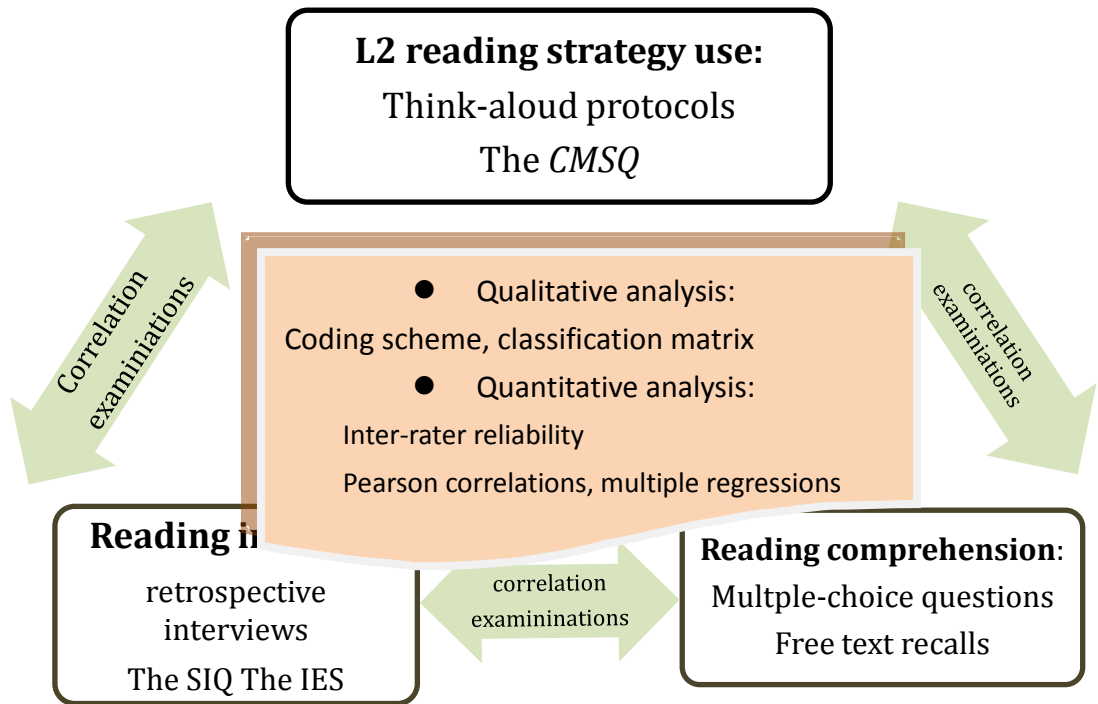
Definitions of Key Terms

L1: The person's first or native language.

L2: The second language the person learns or acquires other than the first or native language.

Expository text: A genre that intends to convey or to explain specific information, knowledge or concepts.

Self-regulated learning (SRL): A learning process whereby students proactively

set goals, select and use strategies, and self-monitor the effectiveness of their learning to attain the desired results (Zimmerman, 2008).

L2 reading comprehension: L2 readers simultaneously extract and construct meanings through interactions and involvement with the text (Snow, 2002).

L2 reading strategies: L2 readers' deliberate, goal-directed attempts to control and modify their efforts to decode text, understand words, and construct meanings of texts (Afflerbach et al., 2008).

Cognitive strategies: Learners' mental procedures to accomplish a cognitive goal, including how information is processed, organized, stored and retrieved from the memory system (Dole, Nokes, & Drits, 2008).

Metacognitive strategies: Learners' metal procedures that allow readers to plan, monitor and evaluate their ongoing performance to accomplish the cognitive goal (Dole, Nokes, & Drits, 2008).

Textbase model: A semantic representation of the text being read, which consists of the propositions and the relations of prepositions of the text (van Dijk & Kintsch, 1983).

Textbase strategies: Reading strategies used to construct the textbase model of the given text, which typically involve word-level or phrase-level strategies

Situation model: A cognitive representation of the events, actions, persons and the situation a text is about, which incorporates readers' previous experiences and prior knowledge about similar situations (van Dijk & Kintsch, 1983).

Interest: Individuals' psychogical state characterized by "focused attention, increased cognitive and affective functioning and persistent effort" (p 545, Ainley, Hidi & Berndorff, 2004).

Sources of situational interest: Text-based characteristics that elicit the interestingness of the text (Brantmeier, 2006). In this study, L2 readers' sources of situational interest are measured by the *Situational Interest Questionnaire (SIQ)*

Perceived interest: Readers' reported interest feelings during reading (Brantmeier, 2006). In this study, L2 readers' perceived interest is measured by the *Interest Experience Scale (IES).*

Limitations

This study has four limitations. First, reading comprehension involves complex processes at the linguistic level as well as at the meaning-construction level (e.g., Kintsch, 1998). Among these variables, this study focuses on three variables that are related to the meaning-construction aspect of comprehension, which are L2 reading strategies and reading interest. Future studies can probe into the relationships between reading comprehension and other affective factors reviewed in this study, such as reading motivation or emotional engagement.

Second, this study only addresses L2 reading comprehension of one specific genre— expository texts. It is likely that in reading different genres, such as narrative texts, the reading strategy use and sources of interest would vary accordingly. More studies could be done to understand whether text genres affect students' reading strategy use and reading interest.

Third, the targeted subjects in this study are all eighth graders who speak Chinese as their first language. Thus, the inferences from the findings are limited to young Chinese-speaking readers who learn English as a foreign language. It is possible that reading process of adult readers who have developed more sophisticated learning strategies and acquired more world knowledge demonstrate a different level

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of strategy use and reading interest. Also, learners whose native languages are more similar to English might use reading strategies for an English text in different ways from Chinese-speaking learners.

The fourth limitation concerns the methodology. This study uses think-aloud verbal protocols as one of the strategy measures. Several caveats have been made about the use of verbalizations to examine individuals' comprehension process. Firstly, readers' verbal ability might influence the nature of their verbal protocols, which might lead to false conclusions about their strategic processing (Schellings et al., 2006; Afflerbach, 2000). Especially for less competent readers, they are also less able to verbalize things they really do in the think-aloud when the task itself already demands a large amount of cognitive resources in working memory. Hence, for readers who are less articulate and expressive, their strategic behaviors might be less evident to interviewers. Second, think-aloud verbal reports cannot represent the complete account of readers' strategic processes (Ericssion & Simon, 1993). Readers' verbalizations in a think-aloud only provide evidence about the most salient and current strategies or thoughts that are at the high-order level of thinking. Due to the constraint of human's memory capacity, the information available for verbal reports in readers' short-term memory could flee or decay easily during the reading process. I try to overcome these limitations by conducting a multi-method assessment design. In addition to employing the think-aloud protocols, I will give students a strategy questionnaire after their reading, so students' who are less articulate are still able to report their strategy use by checking the strategy items on the questionnaire.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This literature review comprises three sections that explicate the relevant theories and empirical studies on reading comprehension, reading strategies, and reading interest. The review starts by introducing L1 and L2 reading comprehension theories. Three perspectives from L1 reading comprehension theories will be presented: the bottom-up approach, the top-down approach and the interactive approach. The literature review will describe how these approaches are applied in L2 reading comprehension. This study will focus on the interactive approach and one particular model, the Construction and Integration (C-I) Model (van Dijk & Kintsch, 1983; Kintsch, 1998), from the interactive perspective will be discussed in more detail.

The second section focuses on the role of L2 reading strategies in reading comprehension. Several aspects of L2 reading strategies are addressed, including L1 and L2 reading strategy transfer and comparisons of reading strategy use by proficient L2 readers and less proficient readers. The methodological issues in reading strategy research are noted and the multi-method assessment for strategy use is introduced.

The third section discusses the relationship between reading interest and reading comprehension. The definitions of three different types of reading interest are introduced first. Then, one theory based on SRL, the Model of Domain Learning (MDL, Alexander, 1997; 2005) is presented to describe how strategic processes and interest are interconnected. This section also offers empirical studies on the effects of reading interest on L1 reading comprehension and L2 reading comprehension.

L1 and L2 Reading Comprehension

This section is divided into two parts. The first part presents current research on the process of L1 reading comprehension as it sheds light on L2 reading comprehension. The second part introduces three perspectives from L1 reading comprehension: the bottom-up approach, the top-down approach and the interactive approach, followed by discussing how to apply these approaches to L2 reading comprehension.

The Processes of L1 Reading Comprehension

> It is clearly false to assume that comprehension is an ability that can be measured once and for all, if only we had the right test. Instead, "comprehension" is a commonsense term for a whole bundle of psychological processes…(Kintsch & Yarbrough, 1982, p. 834).

It is not easy to derive a singular definition of reading comprehension. The nature of reading comprehension as a multifaceted construction has been well-recognized. However, some common characteristics are shared within several major definitions of reading comprehension. For example, Van Dijk and Kintsch (1983) define reading as strategic interactive processes between constructing textbase models and situation models, between decoding linguistic input and integrating text meanings with prior knowledge, and between using local coherence strategies and schematic strategies. The notion of "construction" is also mentioned in Snow's definition about reading comprehension as "simultaneously extracting and constructing meaning through interaction and involvement with written language"

(Snow, 2002, p. 11). The use of "extracting" and "constructing" is a deliberate attempt to draw focus to readers' individual differences in the meaning making process. It implies that readers with different levels of motivation and background knowledge about the reading materials would result in different engagement levels and would cause readers to derive different understandings and learning from the same text.

In Pressley and Afflerbach's (1995) theory of constructively responsive reading, reading comprehension is described as orchestration of various reading strategies to construct meaning from texts. According to Pressley and Afflerbach (1995), reading usually comprises three stages of strategy use, regardless of readers' goals: meaning construction, monitoring and evaluation. In addition, the common strategies include repeating, paraphrasing, predicting or hypothesis confirming, adjusting reading goals, identifying important information, inference-making, integrating, interpreting, and summarizing.

A more inclusive definition that takes the social context into account comes from the RAND reading study group, which characterizes reading as the interactions among three elements: the reader who is the comprehender, the text being read and the activity whereby the comprehension takes place (Snow, 2002). The third element, reading as an activity, focuses on readers' reasons for engaging in the reading. This element is closely tied to the context in which readers are situated. In a classroom context, reading could be a learning task whose main objective is to look for information and acquire knowledge from the texts. In another context, reading could be taken as a leisure activity in which people read for personal pleasure. These different purposes of reading are influenced by various personal motivational beliefs,

and often result in different cognitive or emotional engagements with the comprehending process.

To summarize, these definitions of reading comprehension point out that the reading process is a purpose-driven strategic process, whereby readers need to take specific actions and go through several steps to make comprehension happen and to attain some personal goals for this activity. What are these steps and processes? This question has led many cognitive psychologists to launch an expedition to understand individuals' reading processes. A number of reading models have been proposed and developed during the past decade.

Van den Broek, Young, Tzeng, and Linderholm (1999) provide a concise historical overview of cognitive research on reading. They identify two perspectives on reading in the first generation of reading research (1970-1985): the top-down approach and the bottom-up approach, both of which focus on the products of the reading comprehension, such as readers' recall. Van den Broek et al. (1999) state that this generation of research concerns with clarifying the relationships between textual features and readers' representation memory by manipulating either the textual structures or the linguistic elements. Relevant theories are the story grammars and the script theory. The story grammars theory looks into how readers' knowledge about the structures and common features of narrative texts influences their story understanding and memory (Mandler, 1984). The script theory concerns the relationship between readers' knowledge about the sequence of action patterns for a particular event and their reading comprehension of the text involving such events (Schank & Abelson, 1977).

Van den Broek et al. (1999) explain that the second generation of reading

research (1985-1995) shifts attention from the outcome of reading to the reading process, such as how readers make inferences when they proceed through a text, or how they distribute attention given the limited working memory capacity. An interactive reading comprehension model, Construction-Integration model (Kintch, 1980; 1988) to be explained later, pertains to this category. Currently, the third generation of reading researchers is interested in integrating both memory representations and reading processes to see how these two processes interact and influence each other.

L2 Reading Comprehension Models

In the field of second language reading, previous research on L1 reading comprehension has laid a solid foundation for L2 reading researchers to establish arguments and hypotheses addressing the common and different processes in L2 reading (Urquhart & Weir, 1998; Bernhardt, 1991). The L1 reading models that lend the most support to L2 reading theories are the bottom-up models, top-down models and interactive models (Grabe, 1991). What follows is a concise introduction of each approach with its implications for L2 reading.

Bottom-up approach

The bottom-up model views reading as a "text-driven decoding process" (Gascoigne, 2002), in which readers are like decipherers who go linearly from scanning the letters to recognizing words and then combine words to form sentences (e.g., Gough, 1972). The process involved in the bottom-up model indicates several so-called "lower-level" components or skills required for reading, such as letter recognition, lexicon accessing, syntactical parsing, and semantic parsing. Moreover, since the text is regarded as the ultimate source from which every reader should

derive the same meaning from identical words and sentences, the product of the reading should be the same regardless of readers' personal experiences and knowledge. This makes language proficiency the most or even the sole important factor that accounts for reading comprehension (Gascoigne, 2005; Bernhardt, 2003). For L2 reading, this approach addresses the importance of teaching the direct decoding skills through instruction in phonetics, vocabulary mnemonic techniques and syntactical and semantic parsing to facilitate students' automaticity and fluency in word recognition and sentence processing.

Top-down approach

From the top-down perspective, the role of the reader is highlighted as the creator of text meanings, which therefore takes readers' individual differences into great consideration (Gascoigne, 2002). According to the famous analogy by Goodman (1967, p. 126), reading is a "psycholinguistic guessing game", in which readers selectively and sequentially pick up information cues across words and sentences and generate predictions about what might come next in the following paragraphs. In other words, readers do not read in a precise word-by-word manner, and the product of reading varies across different readers, for they carry different background knowledge which results in different hypotheses and interpretations about the text. In other words, reading is an interactive process where readers constantly seek relationships between the current messages and their prior knowledge.

The top-down perspective strongly emphasizes what the readers know prior to reading and how their personal knowledge influences reading comprehension. The role of readers' background knowledge is further underlined in schema theories (e.g.,

Anderson & Pearson, 1984; Rumelhart, 1980), which argue that a mental framework or a schema is the keystone for learners to access new information, build connections to existing knowledge and sustain memory. The implication from the top-down model for L2 reading is that the background knowledge readers have should also be greatly valued as their language proficiency. This knowledge includes not only knowledge about the topic of the reading materials, but also the familiarity with the textual structures and the genres (Bernhardt, 2003; Gascoigne, 2002).

Interactive approach

In the interactive model, both reader factors and text factors receive corresponding attention and the focus has been shifted to understanding the psychological processes between the reader and the text (e.g., Rumelhart, 1977; Stanovich, 1980; van Dijk & Kintsch, 1983). The interactive approach differs from the previous two approaches in two ways. First, it argues that the reading process does not proceed in a sequential manner. Instead, the bottom-up processes and top-down processes occur simultaneously during the reading activity. As van Dijk and Kintsch (1983) point out, reading comprehension involves concurrent operations at several levels, including the word level, the proposition level, the level of local coherence and the level of global structures and contexts. Secondly, the interactive approach suggests a compensatory function between these reading processes (Stanovich, 1980). For example, readers with more background knowledge can enact more top-down processes to assist the word recognition process. Hence, it is also likely that readers can achieve the same level of comprehension through using different strategies, depending on their individual strengths and weakness in the reading process.

In second language reading, the interactive approach has great appeal because it combines language elements (bottom-up) and background knowledge (top-down) into the same picture. A number of L2 reading research studies have applied one of the most famous interactive models, the Construction and Integration Model (C-I model, Kintsch, 1998; van Dijk & Kintsch, 1983) to explicate L2 text comprehension (e.g., Bernhardt, 2003; Dornin, Graves, & Doyette, 2004; Horiba, Van den Broek, & Fletcher, 1993; Nassaji, 2007).

The Construction and Integration (C-I) Model suggests two different mental representations generated by readers when they are reading a text: a textbase model and a situation model. Both models represent different aspects of the same episodic memory of the text, and they are derived in different ways. A textbase model is a hierarchical propositional representation of the information *within* the text, whereby the higher-level concepts represent the superordinate propositions in connection with the lower-level concepts of the subordinate propositions to form a semantic net (Kintsch, 1998). Textbases are made up by direct linguistic correspondence to the text. Constructing textbases requires syntactic and semantic knowledge of the language in which the text is written.

By contrast, a situation model is an integrated representation of knowledge *about* the text, which connects to readers' prior knowledge in the long-term memory (e.g., van Dijk & Kintsch, 1983; Zwaan & Radvansky, 1998). The situation model is a complete structure composed of the text-derived propositions (the textbase) and additional propositions from personal interpretation related to readers' other resources, such as background knowledge or experiences that are held in the long term memory (Kintsch, 1998). Usually, the textbase representation might not be complete, so

readers rely on their prior knowledge to fill in the gaps and infer the links. In effect, many researchers agree that the construction of a coherent situation model is equivalent to successful text comprehension (e.g., van Dijk & Kintsch, 1983; Zwaan & Radvansky, 1998; Mislevy, 2007). Moreover, some researchers even consider that learning takes place only when readers can form a good situation model from the reading material. For example, Kintsch indicated explicitly that " Learning from the text…requires the formation of a situation model" (1998, p. 295). That is, the question of whether learners comprehend the text, or learn from the text could be translated into whether learners construct a cohesive situation model through text processing.

The C-I model with double foci on linguistic representations and meaning representations in reading could offer the field of L2 reading a lens to reflect the necessary domain knowledge and processes during L2 reading. Kintsch's C-I model is originally designed to account for L1 reading processes tailored for L1 readers who have already acquired basic linguistic and reading skills, such as recognizing phonics, lexicons, and syntactical structures automatically. Accordingly, it focuses less on the textbase modeling processes but more on the integrated situation models.

However, for L2 readers, the initial difficulty might arise mostly in constructing a coherent textbase model due to their limited linguistic-related knowledge and skills. Previous literature shows that L2 readers, compared to L1 readers, use textbase models as important cues to retrieve their memory about the L2 text, not situation models. For example, in a study done by Horiba et al. (1993) to analyze the influence of text structures on L2 readers' recall, 46 Japanese-speaking ninth-grade students were invited to read four texts with different structures and their recall of the texts

was analyzed. The scoring criteria were two idea categories—structure-preserving ideas (the propositions that carries the structural properties of the original text) and meaning-preserving ideas (the main ideas remembered)—in the readers' reading recall protocols. The result showed that the L2 readers remembered significantly more structure-preserving ideas than meaning-preserving ideas. This result implied that L2 readers tend to store the original textual representation of the L2 text in the long-term memory, instead of the integrated semantic representation.

Nassaji (2007) also states the impact of L2 language knowledge on reading comprehension. He suggests that L2 readers generally lack the sociocultural background shared by L1 writers and L1 readers, so they need to rely much more on their L2 linguistic competence to register correct representations of textbase models for meaning construction and integration. He cites empirical evidence to show this reliance on textual linguistic information was found to remain consistent even when the readers' L2 language proficiency started to improve.

The aforementioned research on L2 reading comprehension based on the C-I Model highlights the importance of the interaction between the linguistic decoding process and the higher-order cognitive and metacognitive strategy uses, such as making inferences, and checking meaning coherence between different sentences. This research line indicates that the current question worthy of investigation nowadays is not about which reading process is more important than the other. The direction for future research could be concerned with how to connect these reading processes together in an optimal way to achieve language learning and meaningful comprehension.

Summary

This section defines reading comprehension as an interactive process between readers and the texts as readers not only decode the words to obtain the literal meanings of the text but also actively extract and construct personal meanings from the text. This interactive approach is further applied to explain L2 reading comprehension. The C-I model proposed by van Dijk and Kintsch (1983) has been adopted by L2 reading researchers to investigate the interactions between decoding L2 linguistic input and translating L2 words to construct L1 meanings. This model introduces two different mental representations about the text in comprehension: the textbase model and the situational model. The former refers to establishing a linguistic representation identical to the original text and the latter refers to constructing meanings from the text which are connected to readers' prior knowledge and experiences. Another important point from the C-I model is that to build up textbase models and situational models, multiple strategic processes will be initiated during the comprehension process. Hence, the next section will discuss the importance of reading strategies for reading comprehension.

Reading Strategies

In the first part of this section, the review describes the definitions of reading strategies. Then, three major issues in L2 reading strategy research are discussed. The first one is categorizations of L2 reading strategies, the second one is about cross-lingual strategy transfer and the third one is strategy use comparisons between proficient language learners and less proficient language learners. The methodological issues in researching L2 reading strategy use from this review are further addressed. A summary will be offered in the last part of this section to synthesize the findings relevant to this proposal.

Definition of Reading Strategies

     Learning strategies, according to Oxford (1990, p. 8), are "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations". In the context of reading, reading strategies are "readers' deliberate, goal-directed attempts to control and modify their efforts to decode text, understand words, and construct meanings of texts" (Afflerbach et al., 2008). Moreover, strategy use is complex as it is embedded in complex hierarchies or sequences of behaviors and decisions (Paris, Wasik, & Turner, 1991), which indicates its flexibility across different tasks. These definitions characterize strategy use as readers' intentional, goal-oriented, and adaptive metacognitive exercise of various cognitive actions that might differ when learners process different texts.

     The explicit awareness and consciousness are what distinguish reading strategies from reading "skills". Skills are the automatic or proceduralized execution in text processing, such as word recognition and retrieving meaning from long-term memory (Afflerbach et al., 2008). Reading strategies could evolve to reading skills through constant practice (e.g., Afflerbach & Cho, 2009; Afflerbach et al., 2008). As readers familiarize themselves with using certain strategies, these strategic processes will gradually become automatized to a degree that the operations become unconscious and implicit. One thing to note is that reading skills could be brought back to reading strategies at the level of consciousness. When readers encounter difficulty or cognitive gaps in comprehending a text, conscious and deliberate use of reading strategies must come into play (Alexander et al., 1998). In this regard, it could be inferred that L2 readers would use more strategies, rather than reading skills, in

reading expository texts, because the linguistic decoding process and the concept-laden content in this genre both add up the difficulty level of the texts.

In addition, using reading strategies is a self-regulatory activity that manifests readers' active monitor and control of their cognitive processes to achieve comprehension. Sheorey and Mokhtari (2001) especially remark that it is well-agreed that readers' metacognitive knowledge and metacognitive strategies to monitor their reading process are the most essential elements in proficient reading. Hence, a growing focus of reading strategy research is on how readers set up task goals, select and execute relevant strategies, and make adjustments during this process when the perceived difficulty in the text increases.

L1 Reading Strategies and L2 Reading Strategies

In the field of L1 comprehension, various comprehension strategies have been discussed in the past decade (e,g., Presseley & Afflerbach, 1995; Van Dijk, & Kintsch, 1983). Using three selection criteria: (a) a cognition-based viewpoint, (b) differentiation between expert readers and novice readers and (c) instructional amenability, Dole, Duffy, Roehler and Pearson (1991) identified five categories of comprehension strategies from the literature:

(1) Determining importance: This category is about how readers use their prior knowledge to locate important information in the text. Good readers use their general world knowledge or domain-specific knowledge to evaluate the content and determine the relative importance.

(2) Summarizing information: Summarization strategies refer to locating the main ideas of the text across sentences and paragraphs and synthesizing the information. Through summarization, readers bring up a coherent and integrated

knowledge representation of the original text.

(3) Drawing inferences: Making inferences is the most critical process in the reading-to-learn tasks. Readers use inference strategies to fill in the slots that are originally omitted in the text and accommodate the new piece of knowledge into their existing knowledge structures. Drawing inferences is also equivalent to generating macrostructures to establish a situational model.

(4) Generating questions: Good readers go beyond passively absorbing the information fed by the text. They actively compare this information with their knowledge and ask questions critically and reflectively when they encounter comprehension gaps.

(5) Comprehension monitoring: The strategic process of monitoring understanding and adapting different strategies to solve comprehension problems makes another distinction between good readers and poor readers. Good readers tend to monitor and evaluate the whole reading process constantly. Moreover, readers also need to have "fix-it" strategies as to know how to remove the comprehension obstacles once they encounter.

van Dijk and Kintsch (1983) provide a comprehensive list of comprehension strategies from understanding at the textbase level to forming situation models based on their Construction-Integration reading comprehension model: language strategies, grammatical strategies, discourse strategies, local comprehension strategies, local coherence strategies, macrostrategies, schematic strategies, knowledge use strategies, cultural strategies, social strategies, and interactional strategies. However, van Dijk and Kintsch define strategies differently from the general concept of reading strategies. They do not regard consciousness as a necessary element of reading

strategy use They assert, " In rather complex problems, part of these strategies may be consciously intended. Yet, part of them will also be more or less automatized,,," (van Dijk & Kintsch, 1983, p. 70). Hence, they focus on strategies being cognitive mental representations of a sequence of actions, instead of the actual behaviors or actions that could be articulated and observed.

In addition, some recent research focuses on the aspect of readers' metacognition during reading. For example, Mokhtari and Reichard (2002) evaluated the degree to which students were aware of the various processes involved in reading and their strategy use in coping with reading difficulty. A questionnaire, metacognitive awareness of reading strategies inventory (MARSI) was used in this study. The questionnaire located several common and major reading strategies from previous literature and found three factors with 825 English- speaking American students from 6th to 12th grade: (a) global reading strategies, which asked about students' global analysis of a text and setting stages for reading a text, (b) problem-solving strategies, which asked students how they solved the problems when the text became difficult, and (c) supporting reading strategies, which asked about students' use of outside reference resources and other practical strategies that could support comprehension.

By contrast, the strategy categorization in L2 reading strategy research differs to some extent from that in L1 reading strategy research. In a review study on L2 reading strategies at the secondary and university level (Brantmeier, 2002), the researcher found that many studies which investigated L2 reading strategies through verbal protocols or strategy questionnaires differentiated reading strategies into two dichotomies, such as local strategies versus general strategies (e.g., Block, 1986;

1992), top-down strategies versus bottom-up strategies (e.g., Abbott, 2006; Carrell, 1989) and global strategies versus local strategies (e.g., Brantmeier, 2000; Young & Oxford, 1997). The main difference between these two categories lies in whether the reading strategies are dealing with word-level processing involving word recognition and graphophonic processing, or meaning-construction, semantic processing. For example, in Young and Oxford's (1997) study, the local strategies included decoding vocabulary, breaking lexical items into parts, expressing use of a gloss, and questioning meanings of the words or phrases. The global strategies contained skimming, reading headings and subtitles, recognizing text structures, anticipating content, identifying main ideas and using inference with background knowledge.

A different categorizing scheme was derived from Anderson (1991). This study analyzed 26 adult Spanish-speaking ESL learners' strategy use from think-aloud reports as the readers were reading an article in a textbook. The strategies were coded by their functions in reading: (a) supervising, such as recognizing loss of concentration and making prediction about an unknown word, (b) supporting, such as skipping unknown words or scanning for general understanding, (c) paraphrasing, such as using cognates between L1 and L2 to comprehend or translate a word into L1, and (d) establishing coherence, such as using contextual cues to interpret a word or using background knowledge. This categorization by cognitive functions is closer to the aforementioned L1 reading strategy classification. In addition, in my view, the supervising strategies are actually similar to metacognitive monitoring. Hence, this categorization draws distinctions between cognitive strategies and metacognitive strategies.

In a similar vein, some researchers adapt the information-processing perspective

and the SRL framework to investigate L2 readers' strategy use in terms of the cognitive and metacognitive processes (e.g., Chuang, 2007; Phakiti, 2003; 2008; Sheorey & Mokhtari, 2001). Cognitive strategies are mental procedures to accomplish cognitive goals. The specific components include how information is proceed, organized, stored and retrieved from the memory system. On the other hand, metacognitive strategies are the mental procedures that allow readers to plan, monitor and evaluate their ongoing performance in accomplishing the cognitive goal (Dole, Nokes, & Drits, 2008).

In Phakiti's L2 reading strategy questionnaire (2003, 2008), the cognitive reading strategies involved three categories: (a) comprehending for understanding, including identifying main ideas, translation, predicting and inferencing, (b) memory for storing information in working memory, such as repeating or paraphrasing, and (c) retrieval for activating prior knowledge, such as using prior content knowledge or grammatical knowledge. The metacognitive category included planning, monitoring and evaluation. These strategies asked L2 readers how they plan what to do before the task, check ongoing comprehension progress, and assess task difficulty and product accuracy.

In Chuang's task-based reading strategy inventory (2007), the factor analysis yielded six categories with a sample of 384 Chinese-speaking EFL learners in 8th grade: (a) metacognitive strategies, (b) grammatical/morphological strategies, (c) skipping strategies, (d) translation strategies, (e) support strategies, (f) problem-solving strategies and (g) purpose-emphasizing strategies. This categorization still aligned with the metacognitive/cognitive distinction; the first group of strategies concern L2 readers' metacognitive monitoring as in the general

reading process, and the latter six categories of strategies pertain to their cognitive processes at the linguistic levels of comprehension.

L1 and L2 Reading Strategy Transfer

The above studies on reading strategy classification in L1 and L2 show that L2 reading strategies are primarily composed of general strategies that focus on general meaning construction and metacognitive monitoring as reading in L1, and language-related strategies that deal with the linguistic aspects of L2 textbase construction. Therefore, readers' strategic competence of L1 reading might have significant influence on L2 reading comprehension. This assumption was first examined by Cummins (1979a; 1979b), who reviewed several critical factors on bilingual students' second language development. He then postulated the "Linguistic Interdependence Hypothesis", which argued that competent L2 proficiency requires an adequate level of L1 language skills. In other words, learners with well-developed L1 language skills are more likely to achieve success in acquiring the second language.

Many researchers have used the Linguistic Interdependence Hypothesis to investigate cross-lingual transfer in L1 strategy use and L2 strategy use. For example, Jimenez (1995) did multiple case studies to analyze bilingual students' reading strategy uses. The participants were two proficient bilingual Latina 6th graders and one monolingual Anglo 6th grader. The bilingual students read the narrative texts and the expository texts in both English and Spanish. Their think-aloud verbal reports, interviews, prior knowledge measurements, text retellings, and questionnaire responses were collected during and after the reading tasks. The results showed that the proficient bilingual readers demonstrated sharp metacognitive awareness of the

relationship between the two languages (Spanish and English) and explicitly used multistrategic approach to read both the L1 texts and the L2 texts. Both the proficient bilingual readers and the monolingual readers employed a variety of strategies but in different levels of the reading process. The bilingual readers used the strategies to solve vocabulary-level problems, while the monolinguals used more global meaning-oriented strategies.

Sheorey and Mokhtari (2001) conducted a questionnaire study to compare how L1 readers used reading strategies differently from L2 readers with academic materials at the university level. 150 native-English-speaking US students and 152 ESL students accomplished the Survey of Reading Strategies (SORS). The result showed that both groups revealed a similar reading strategy use pattern with the same order of importance across three strategy subcategories. Both groups used the cognitive strategies the most, followed by metacognitive strategies and the least-used strategies were supporting strategies. In addition, the ESL learner group used significantly more supporting strategies than the native-speaking group.

In the follow-up study (Mokhtari & Reichard, 2004), a similar reading strategy use pattern emerged again in an English native-speaking group and an ESL group in different socio-cultural settings. The data were collected from 141 English native-speaking university students in the U.S. and 209 ESL university students who were at the proficient level in Morocco. The instrument, the metacognitive awareness of reading strategies inventory (MARSI), measured learners' metacognitive awareness and perceived strategy use for academic English texts. The findings revealed a remarkably similar pattern across the learners in the two different instructional settings. Both the native English-speaking learners and second language

learners employed the problem-solving strategies the most, followed by the supporting strategies and the global reading strategies. The difference appeared in the frequency of the strategy uses. The second language learners generally used the reading strategies more often than the English native-speaking students.

In the study by Chuang (2007), both qualitative and quantitative methods were employed to explore L1 and L2 reading strategy use of Chinese-speaking EFL students in the 8th grade in Taiwan. Specifically, this study compared the difference between high-achieving (in both L1 and L2) students' and low-achieving students' reading strategy use. The qualitative study collected think-aloud verbal data and semi-structural interviews from six students as they read one English expository text and one Chinese expository text. The quantitative study included 384 students. The task-based reading strategy inventory was distributed twice; one after the students finished an English expository text and one after they read a Chinese expository text. The results from this mixed-method study confirmed that high-achieving students employed reading strategies more frequently, flexibly and diversely in both L1 reading and L2 reading. By contrast, low-achieving students used fewer cognitive strategies and metacognitive monitoring strategies when they read the L1 text and the L2 text.

To sum up, these studies supported that L1 reading strategies are transferable to the reading o L2 texts. Good L2 readers enact many L1 strategies similar to what L1 readers use in general comprehension process, which supports that a certain level of strategic competence in L1 reading is necessary for L2 reading. L2 readers, in general, use more strategies to solve local problems, such as unknown vocabulary, to support their reading at the textbase level, while L1 readers employ more top-down strategies

to integrate meanings from texts.

Proficient and Less Proficient Reading

A significant line of research on learning strategies is to compare the strategies used by expert learners and novice, or less proficient learners when they carry out the same tasks (e.g., Rubin, 1975). In light of reading strategies, most of the previous studies found that global and meaning-oriented strategies led to proficient reading, while less proficient readers used more bottom-up strategies to solve word problems at the sentence level. For example, In Hosenfeld's (1977) study on strategy differences between successful learners and less successful learners, 28 high-achieving ESL ninth graders and 20 low-achieving ESL ninth graders were involved in a think-aloud reading task. The result showed that the more successful language learners carried the meanings of the passages in mind, kept integrating new meanings, read in "broader phrases" and skipped the words which were considered unimportant. The less successful learners, however, showed rapid memory loss of the meanings once they decoded the sentences, read in smaller phrases, and gave equal attention to every word in a sentence which resulted in greater confusion across words and sentences.

Carrell (1989) studied how L2 learners' perceived use of reading strategies related to their reading comprehension. 45 Spanish native-speaking college students with mixed English proficiency levels completed a metacognitive awareness strategy questionnaire and then read an English text with multiple- choice comprehension questions. The instrument is the Metacognitive Questionnaire which involved four dimensions: (a) confidence, measuring readers' confidence beliefs in their own reading abilities, (b) repair, measuring readers' repair strategies to fix comprehension

problems, (c) effective, measuring reading strategies perceived to be effective for

readers , and (d) difficulty, measuring aspects of reading that are difficult for readers.

Based on the questionnaire results, the researcher further categorized the subjects into

two strategy use groups: global strategizers and local strategizers. The global

strategizers preferred to use global reading strategies related to the use of their

background knowledge, content details, or text structures. The local strategizers used

more sentence-level strategies such as sound-letter and word-meaning matching. It

was found that the global strategizers had significantly higher scores on reading

comprehension than the local strategizers.

However, not all studies received consistent results showing that global reading

strategies were more important for proficient L2 reading. Anderson (1991) researched

the reading strategy use of 28 Spanish-speaking adult learners of English. The

think-aloud reports were collected as the participants carried out a standardized

reading assessment and a textbook reading task, both of which were followed by

several multiple-choice comprehension items. The study found that the total number

of reported strategy use contributed significantly to both reading comprehension

scores. Yet, no significant relationships between any particular types of reading

strategies and reading comprehension appeared. He concluded that the strategic

reading depended not on what kind of strategies readers could use, but on how

readers could apply strategies successfully and persistently during comprehension

successfully. However, I hypothesize that these inconsistent results might be due to

the use of different strategy categorizations in these studies. Anderson (1991) coded

the subjects' reported strategy uses by four cognitive functions (described earlier in

this review), not the global/local dichotomies in other studies. Therefore, his result of

non-significant difference across strategy categories was not comparable with the previous findings on a stronger effect from global reading strategies on reading comprehension than from local strategies.

Another characteristic of proficient L2 readers is their stronger capability of monitoring and taking actions to solve their reading difficulties than less proficient readers. In Block's study (1992), eight proficient L2 college students and six less proficient L2 college students read an expository text and their think-aloud responses and retrospective reports were obtained. Three types of metacognitive strategies were coded, (a) evaluation, (b) action and (c) checking. It was found that to deal with vocabulary problems, the proficient readers guessed the meaning from the context, elaborated the text to make it more concrete, inferred the meaning, and tried not to let the information loss interfere with their overall comprehension. By contrast, the less proficient readers' attempt to solve the word problems was very limited. They could recognize the problems, but they either skipped them or made short and random guesses that were incoherent with the context.

The quality differences in using problem-solving strategies flexibly between proficient readers and less-proficient readers were also reflected in Jimenez et al.'s (1996) study. These researchers also used think-aloud protocols and interviews to compare the strategic processes between two different groups of ESL learners in the sixth and seventh grade. One group included eight Latino students who were also successful English readers, and another group had four Latino students who were marginally successful English readers. The readers' strategies were classified into three categories: (a) text-initiated strategies, such as focusing vocabulary, (b) interactive strategies, such as inferencing and questioning, and (c) reader-initiated

strategins, including monitoring and metacognitive awareness. The study found that the more successful bilingual readers actively used their knowledge across two languages to overcome the difficulties in reading the L2 text. They drew on an array of strategies, such as applying cognates, to decode the unknown words and guess the meanings. By comparison, the less proficient bilingual students tended to view this reading as a task to be finished, rather than to comprehend, so they took fewer actions to solve the unknown words. Moreover, they were more rigid in retaining the initial understanding about the text and forced the subsequent text meaning to fit their initial interpretations, rather than changing and updating the whole knowledge structure to maintain coherence.

Table 2.1 lists the empirical studies reviewed above. To conclude, proficient L2 readers generally use more top-down and global strategies to achieve overall comprehension that go beyond basic text understanding. This reading process is similar in creating the situation model of the text in van Dijk & Kintsch's C-I model. For the local problems at the textbase level, proficient L2 readers are also more capable of using different strategies flexibly and creatively with more perseverance than less proficient readers.

Table 2.1. *The Studies on L2 Reading Strategies and Reading Comprehension*

Authors	Participants	Methods/Analysis	Results
Hosenfeld (1977)	20 high-achieving ninth graders and 20 low-achieving ninth graders in the ESL context	Think-aloud reports/ Coded categories: main-meaning and word-solving strategies	The more successful language learners used more meaning-oriented strategies while the less successful readers focused more on the local word problems of the text.
Carrell (1989)	45 college students in a intermediate ESL course whose native language was Spanish	Metacognitive awareness strategy questionnaire, an English text with multiple-choice comprehension questions/ Four predetermined structures: Confidence, repair strategies, effective strategies, difficulty	The global strategizers had significantly higher scores on reading comprehension than local strategizers.
Anderson (1991)	28Spanish-speaking adult learners of English	Think-aloud reports of a standardized reading assessment and a textbook reading task/ Coded categories: supervising, supporting, paraphrasing, establishing coherence	1. The total number of reported strategy use contributed to both of the two reading comprehension scores. 2. No relationship between any particular categories of reading strategies and reading comprehension appeared.

Block (1992)	8 proficient ESL college students and 6 less proficient ESL college students	Think-aloud and retrospective reports of an expository text/ Coded categories: (with a focus on comprehension monitoring): evaluation, action and check	The proficient readers used multi-strategies to solve comprehension problems, while less proficient readers could identifies the problems but did not attempt to solve them or used ineffective strategies
Jimenez (1995)	One English native student, one proficient English-Spanish bilingual student and one less proficient English-Spanish bilingual student.	Think-alouds, interviews, text retelling, prior knowledge measures and a questionnaire/	Four key dimensions which distinguished the proficient bilingual student form the other two: The student was more propose-driven. more aware of the relationship between English words and Spanish words, used a multi-strategic approach to read L1 and L2 text and took advantage of her bilingualism
Jimenez, Garcia, and Pearson (1996)	Latino students in the sixth and seventh grade: 8 successful English readers and 4 marginally successful English readers	Think-aloud protocols and interviews/ Coded categories: text-initiative strategies, interactive strategies, reader-initiated strategies	The more successful bilingual readers actively used their knowledge across two languages to overcome their reading difficulties, while the less proficient bilingual students took fewer actions to solve the unknown words and were less flexible in their strategy use.

Phakiti (2003, 2008)	561 university students in Thailand	Trait cognitive-metacognitive strategy questionnaire and state cognitive-metacognitive strategy questionnaire/ Factor analysis revealed six categories: Cognitive strategies-- comprehending, retrieval, inference Metacognitive strategies-- Planning, monitoring and evaluation	1. The trait metacognitive strategy use had strong influence on trait cognitive strategy use, directly affected state 2. Metacognitive state strategy use and indirectly influenced state cognitive strategy use.
Oxford, Cho, Leung, and Kim (2004)	36 ESL adult students in the US context	task-based reading strategy questionnaire/ Did not categorize strategy items	1. In no-task condition, high-proficiency group reported higher frequency of strategy use (the trait perspective). 2. In the task conditions, high-proficiency group reporting less frequency of strategy use than the low-proficiency group. 3. In the difficult task condition, low-proficiency group in general used more cognitive strategies during the reading than the high-proficiency group.

Chuang (2007)	6 EFL eighth-graders for the think-aloud task/ 384 EFL eighth-graders for the questionnaires in the context of Taiwan	1.think-aloud verbal data and semi-structural interviews/ Coded categories: pre-reading, during reading and after reading 2.task-based reading strategy questionnaire revealed 7 strategy factors: (a) metacognitive strategies, (b) grammatical/morphological strategies, (c) skipping strategies, (d) translation strategies, (e) support strategies, (f) problem-solving strategies and (g) purpose-emphasizing strategies.	High-achieving students tended to employ many cognitive and metacognitive reading strategies more frequently, flexibly and diversely in both L1 reading and L2 reading than low-achieving students.

Methodological Issues in Assessing L2 Reading Strategy Use

The review of the studies which investigated general L2 reading strategy use revealed miscellaneous findings which seemed to be disconnected from each other. I consider that this might be due, in part, to different categorization systems from different assessment tools. Two major methods were employed by most of the studies to assess reading strategy use. The first one is through questionnaires (e.g., Oxford et al., 2004; Phakiti, 2003; 2008; Carrell, 1989; Chuang, 2007) with which learners self-report their strategy use prospectively (e.g., "What do you generally do during reading") or retrospectively (e.g., " What did you do to read the given text"). This type of assessment measures readers' strategy use on a limited list of strategy items, and the factor analyses used to identify the strategy categories usually reveal different

strategy clusters in different studies.

Moreover, several concerns about the validity of self-reported retrospective measures were raised, including systematic response distortions, the effects of social desirable response bias, the time lag between actual performances and response time, and the contextual interferences in which the measure is used (Razavi, 2001; Desoete, 2008; Veenman, 2005). Self-report measures were also shown to have low correspondence with what students actually did. Veenman et al. (2003) examined how students' responses on a questionnaire about learning styles correlated with their actual study processes obtained through concurrent think-aloud verbal data. A great discrepancy was found between the self-reported data and the study process measures. Most important of all, the study process measures were the stronger predictors for the learning outcomes than the self-reported data.

A similar result was found in Cromley and Azevedo's study (2006). Their study compared students' reading strategy use obtained from two concurrent measures: think-aloud protocols and multiple-choice strategy use measure and one prospective self-report questionnaire, the MARSI. They found that the two concurrent measures were both significantly related to the readers' comprehension scores, while the MARSI did not have significant correlations with the two concurrent measures as well as the reading comprehension. Therefore, it is cautioned that self-report measures are limited in reflecting metacognitive processes accurately and their explanation power is often restricted to account for learner' performances (Veenman et al., 2006).

The second popular method in L2 reading strategy research is think-aloud protocols (e.g., Chuang, 2007; Hosenfeld, 1977; Anderson, 1991; Block, 1992;

Jimenez et al., 1996). These L2 reading strategy studies used think-alouds to collect learners' ongoing thoughts as a means to explore the strategic processes when L2 learners read L2 texts or complete comprehension tests. Cohen (1996) defines this type of verbal reports as "self-revelation" data, characterized by readers' verbalization of the conscious thought processes they are attending to during the task without further explanation or interpretation. As for data analysis, constructing a coding system to categorize the protocols and interpret some of the prominent strategic processes are the common ways for qualitative data analysis in these studies. However, the coding processes and the rationale of strategy categories are usually coarsely described without providing solid theoretical references, and the results are often presented without triangulation data. Hence, the issue of validity might not be addressed adequately in these studies.

In the field of L1 reading comprehension, except for questionnaires and think-aloud protocols, the other available techniques in researching metacognitive processes include systematical observations, stimulated recalls, on-line computer log file registration and eye-movement registration (Veenman, 2005). Due to the fact that every method has its advantages and limits, Veenman and his colleagues have encouraged the use of multi-method designs that include multiple measurements to offer in-depth view of metacognitive activities (Veenman, 2005; Veenman et al., 2003; Veenman et al., 2006; Desoete, 2008). Three types of multi-method designs are suggested: (a) within-method design, which is to apply similar instruments within time or across time, (b) within-time time design with different measurements which could be prospective, concurrent or retrospective, and (c) across-method-and-time design, which is to apply different measures at different times. Afflerbach (2000) also

notes that supplementing think-aloud protocols with triangulation data, such as outcome measures, greatly strengthens the evidential arguments made by the concurrent measure.

This study especially focuses on using think-aloud verbal reports as a concurrent process measurement that can unveil the information flow and mental activities held in readers' working memory during the on-line processing of the text, especially how they plan, use strategies, and make evaluations (Afflerbach, 2000; Ericsson & Simon, 1993; Pressley & Afflerbach, 1995; Schellings et al., 2006). This methodology can be adopted to investigate reading for different purposes, such as focusing on certain type of reading strategies, exploring complex orchestration of different strategies, or studying contextual influences on reading strategy use. Moreover, not only the cognitive responses, verbal reports also allow researchers to observe the nuanced interactions between readers' affect, such as motivation or interest, and the contextual factors, including the textual features and the purposes of reading (Afflerbach & Johnston, 1984). Therefore, verbal protocols are believed to be a valid and matured technique to explore the cognitive, affective and social aspects of strategic reading (Afflerbach, 2000; Ericsson & Simon, 1993).

In addition, although think-aloud protocols are qualitative data by nature, it could also be analyzed quantitatively. For example, Veenman and Beishuizen (2004) developed a processes measurement to assess learners' metacognitive skillfulness for text studying using verbal reports. This measurement collected learners' think-aloud data when they read a given text. Then, two expert judges were invited to identify the metacognitive activities in the verbal reports and then rate the quality of learners' metacognitive behaviors as "shallow and inattentive" or "deep and deliberate" from a

scale of 0 to 2. The ratings were thereby converted into quantitative data and statistical techniques were applied for data analysis. In a similar way, Desoete (2008) used this method to analyze students' on-line verbal reports for solving math problems. After categorizing the verbal reports into distinct metacognitive activities, the researcher further calculated the metacognitive skill scores by summing the total number of present activities revealed in the verbal reports. This quantitative data was proven to be highly correlated to other measures and students' math test outcomes as well.

In contrast to the plethora of research methods developed in L1 reading research, the methodologies in L2 reading strategy studies seem rather restricted and conservative. Most of the studies are still based on the traditional methods, such as questionnaires or think-alouds. For the studies which conducted think-aloud protocols, few studies attempted to convert the verbal data into quantitative information with which statistical techniques could be applied. Thus, the ways to interpret the obtained data were also limited, which might further inhibit the development of L2 reading theories and practice. Therefore, a multi-method design in L2 reading strategy use is greatly valuable as a more progressive methodology to better expand our understanding about L2 reading processes.

Summary

This section reviewed relevant studies on the relationship between L1 reading strategies and L2 reading strategies to contrast the similarities and difference between these two reading processes. To synthesize, proficient L2 readers generally use many similar strategies as proficient L1 readers do, and these effective strategies are more top-down, related to constructing and elaborating overall meanings of the text.

However, not all researchers agree that global strategies are more beneficial for L2 reading comprehension than bottom-up strategies. A more generally-accepted conclusion about how a "good L2 reader" reads so far is that proficient L2 readers demonstrate higher level of metacognitive controlling and monitoring during their reading process. They are more aware of the presence of possible comprehension problems and pay more attention to the coherence of meanings across passages.

One deficit is noted in current L2 reading strategy research, which is the inadequacy in research methodologies. Most of the studies used either a quantitative approach through questionnaires or a qualitative approach using think-aloud protocols and interviews to assess reading strategy use. Rarely have studies in L2 reading strategies employed a multi-method design to compare how verbal data, other process measures, retrospective measures and product measures are interrelated. Hence, a more sophisticated assessment for L2 reading strategy research is strongly desirable.

Interest in Reading Processes

This section begins with introducing three concepts of reading interest. Thereby, the theory, the Model of Domain Learning which delineates the relationships between reading interest and strategic processes is described in more detail. In addition, empirical studies which document the effects of reading interest on L1 reading and L2 reading are presented and discussed.

The Definitions of Reading Interest

Almost 30 years ago, Kintsch (1980) already indicated interest is one important affective factor in relation to text comprehension. He categorized it as emotional interest and cognitive interest. Emotional interest was defined as readers' vicarious

experiences from empathizing with specific characters in stories or some emotional events in texts, such as violence or fear. On the other hand, cognitive interest referred to emotional arousals from mental interactions with texts, including using prior knowledge, readers' comprehension of the contents, and appreciating writing styles of texts. However, previous research has focused more on cognitive interest and its impact on reading comprehension, not on emotional interest, so the following discussion on reading interest will be based upon the view of cognitive interest.

Reading interest has been traditionally distinguished into two different concepts. The first one is situational or text-based interest, and the second one is individual or topic interest (Fox & Alexander, 2004; Alexander, 1997; Hidi, 1990; 2001; 2006; Schiefele, 1991). Situational interest or text-based interest refers to a "transient arousal or heightened attention sparked by features of the proximal environment" (Fox & Alexander, 2004, p. 4), which depends on the interestingness of the situation. It is evoked from the features of an ongoing task but also is likely to disappear fleetingly. Although situational interest appears to be short-lived and versatile, it is assumed to serve as a significant catalyst for the processes of cognitive and metacognitive strategy use during reading, and therefore can improve comprehension (Jetton & Alexander, 2001).

On the other hand, individual interest or topic interest, is a more enduring and long-lasting personal preference for a certain subject, topic or activity. Hence, individual interest is less affected by textual and contextual characteristics. Readers who have stronger individual interest are expected to engage more deeply and persistently with the reading activities, and have more stable and effective learning outcomes (Schiefele, 1991). Two aspects of topic or individual interest are further

identified: feeling-related valances and value-related valances (Krapp, 2002; Schiefle & Krapp, 1996). Both of these valances have intrinsic nature. Feeling-related valances are feelings associated with the topic, such as feeling of involvement or stimulation. Value-related valances refer to how individuals identify the importance or personal significance of a certain topic without considering the extrinsic benefits attached to that topic.

A recent development in the research on interest is a refinement of a new construct different from situational interest and individual interest, termed as interest experiences (Krapp, 1992; Hidi & Reinninger, 2006; Tsai, Kunter, Lüdtke, &Trautwein, 2008). Interest experiences are describes as a psychological state comprised of an affective component of interest or positive emotion and a cognitive component of concentration. At first glance, interest experiences seem to be similar to situational interest because they are both context-bound and related to task features. However, interest experiences differ from situational interest in that the former focuses on readers' psychological involvement with tasks or activities, such as feelings of interest and feelings of concentration. By contrast, situational interest emphasizes on the external contextual features or stimuli that can induce interest (Hidi & Reinninger, 2006), including the writing styles of the text, the topic of the text and the ideas in the text. To research interest experiences, Tsai et al. (2008) has taken an "intraindividual approach " (p. 463) to investigate how individual characteristics and environmental factors contribute to learners' interest experiences. Their findings suggest that interest experiences is an independent construct and a supportive context and learners' individual interest are both relevant to inducing interest experiences.

Model of Domain Learning

The mechanism about how interest influences quality of learning is not clear yet (Schiefele, 1991; Hidi, 1990). I found one theory from the field of SRL, the Model of Domain Learning (MDL, Alexander, 1997; 1998; 2005; Alexander, Jetton & Kuliokwich, 1995) can provide explanations about how interest relates to cognitive processing and in turn contributes to learning.

The MDL especially introduces three factors in self-regulation: domain knowledge, strategic processes and interest. Another characteristic of the MDL is that it explicates a well-defined developmental sequence in a three-stage learning trajectory: acclimation, competence and expertise. Taken together, the MDL offers a longitudinal picture on the interactions among domain knowledge, strategic process and interest as learners advance from acclimation to competence, and finally reach expertise. At the acclimation stage, readers' language knowledge and reading skills are still low and they can only use superficial-level reading strategies. Meanwhile, readers might only have situational interest which depends on reading contexts or reading tasks, partly because of their limited access to necessary knowledge and strategies to accomplish the tasks. With growing content and language knowledge through constant practice, readers gradually move to the stage of competence when they develop more knowledge and sophisticated strategies. It is usually in the competence stage or the expertise stage at which readers acquire a certain level of domain knowledge about the reading topics and reading strategies that their individual interest starts to grow. Readers who have stronger individual interest are expected to engage more deeply and persistently with the reading activities, and have more stable and effective learning outcomes (Alexander, 1997; 2005).

In the MDL, the importance of interest is highlighted in learning within a

specific academic domain. Interest is considered to be a complex and evolving construct. The strength of interest can be taken as a function of both domain knowledge and strategic processes. For example, in the study by Alexander et al. (1995), 47 advanced university students were recruited to read four domain-related expository texts: two immunology texts and two physic texts. Their domain knowledge, interest in the reading passages and recall were measured. Cluster analysis found two groups: (a) learners with higher subject-matter domain knowledge about the texts, who also demonstrated stronger situational interest and had better recall performance and (b) learners with very low level of domain knowledge, very low interest and very little information recall.

In another similar study which used the same texts and similar instruments with 78 undergraduate students who possessed less professional background about the topics of the texts (Alexander et al., 1995), two similar profiles of the learners emerged. One group was measured higher in terms of background knowledge, situational interest, individual interest and recall performances, and another group was lower on all of these variables. In addition, this study found a third group who demonstrated adequate background knowledge and above-average recall scores, but appeared uninterested in the reading passages. These learner profiles indicated the three factors play different roles in different developmental stages of learning and each has its unique contribution to proficiency.

Reading Interest and Reading Comprehension

Reading interest has been shown to have significant influence on high-level reading comprehension beyond textbase comprehension in the literature. In Schraw, Bruning and Svoboda's study (1995) with 108 college students, the finding showed

that students' situational interest accounted for 12% of the variance in the recall of the text. The subjects who experienced higher situational interest recalled more information from the text. Moreover, interest was found to have a positive relationship with more elaborated processing of comprehension.

Schiefele and Krapp (1996) conducted a study with 80 male college students reading one expository text. The students' prior knowledge, general intelligence and topic interest were measured. It was found that topic interest significantly related to the students' recalls of idea units, elaborations, and main ideas.

Schiefele (1991) in his review described five experimental studies which examined the effects of topic interest on text comprehension. These studies showed that high-interest readers were able to answer more deep-comprehension questions and construct more meaningful knowledge structures about the texts than low-interest readers, even when their intelligence and prior knowledge were controlled. However, Schiefele pointed out that in most of these studies, the differences in reading outcomes between high-interest readers and low-interest readers were mainly on the aspects of verbatim and propositional representations, not on the situational representations.

The same results appeared in the following study (Schiefele, 1996) where 107 10th graders read two expository texts of different topic interest. The high-interest readers developed strong verbatim and propositional representations while low-interest readers only read at a superficial level. This tendency might imply that readers' interest can induce deeper engagement in text processing above the word level, but situational model processing might require much more mental sources other than interest.

What are the situational interests in a text that can help engage learners in reading? The study by Schraw et al. (1995) examined the possible situational sources that can influence readers' perceived interest and text recalls. From a sample of university students, they identified six interest sources in a text: ease of comprehension, coherence, vividness, engagement, emotiveness, and readers' prior knowledge. This list included both the text characteristics, such as comprehensibility, coherent structures, attractive content, and the individual differences, such as emotional responses and prior knowledge. They also found that perceived interest had significant contributions to text recalls. After perceived interest was controlled, ease of comprehension, vividness and emotiveness were directly related to text recalls.

Wade, Buxton and Kelly (1999) also investigated what text characteristics could make readers feel interested and how their interest influenced text recalls through retrospective think-aloud protocols. The participants in their study were university students. The findings revealed five textual characteristics that were most associated with interest: (a) the importance of the information, (b) the unexpectedness in the information, (c) the connection between the content and readers' prior knowledge or experiences, (d) imaginary and vivid language, and (e) authors' connections, such as using comparisons to make the text more coherent. In addition, the readers successfully recalled more sentences which they rated as more interesting or more important.

The studies above on reading interest and reading outcomes mostly confirm that reading interest helps achieving better comprehension. How does interest affect learning outcomes? Even in the series of studies which tried to validate the MDL by

Alexander and her colleagues, the answer has not been fully addressed. Part of the

reason is that their studies mainly used questionnaires as the research method, so the

nuanced interactions between interest and learning could not be completely revealed.

This research area could be further explored by employing on-line assessments that

would allow closer observation of interest, strategic processes and learning.

Reading Interest and L2 reading

To date, there has been limited research focusing directly on the relationship

between L2 reading and reading interest. Most of the L2 studies used to place interest

as one dimension of language learning motivation (Keller, 1984; Brantmeier, 2006).

Recently, one study done by Brantmeier (2006) attempted to establish a

multicomponent model of interest to systematically examine how sources of interest

in a text contributed to L2 readers' perceived interest and reading comprehension. In

this study, sources of interest referred to the situational interest induced by the text

and perceived interest was similar to the concept of interest experiences by Tsai et al.

(2008). 108 advanced adult students who learned Spanish as a second language

participated in this study. The students read one story, finished the reading

comprehension tasks and completed the Sources of Interest Questionnaire and the

Perceived Interest Questionnaire regarding the text. Sources of interest include five

indicators: (a) cohesion, (b) prior knowledge, (c) engagement (d) ease of recollection

and (f) emotiveness. The results showed that among the five sources of interest,

cohesion, engagement and ease of recollection were uniquely related to perceived

interest. One of the sources of interest, ease of recollection, significantly related to all

three measures of reading comprehension: text recalls, sentence completion and

multiple-choice questions. In addition, the students' perceived interest also had

significant relationships with their reading comprehension performances. These results supported that reading interest indeed plays an important affective role during L2 reading and "should not be ignored" (p. 106). In addition, these results suggested that most influential source of situational interest for L2 readers are the comprehensibility of the text, which is at the linguistic level.

I also did one study that compared L2 readers' perceived interest and reading strategy use with an easier text and a more difficult text (Lin, 2009). This study included 68 EFL students in the 8th grade. The participants were given one easier expository text and one difficult expository text followed by comprehension questions, a task-based reading strategy questionnaire and an affective engagement questionnaire on the two occasions. The results showed that the L2 readers engaged more deeply and expressed more interest in the easier text than the difficult text. Moreover, the highly-engaged readers used many metacognitive strategies more frequency than the less-engaged readers. In addition, task difficulty also induced different patterns of strategy use. For the easier text, cognitive strategies were used more frequently, while for the difficult text, the metacognitive strategies were initiated more often. Since task difficulty was highly correlated with interest experiences, it was possible that the differences in strategy use between the task conditions were caused by different levels of interest experiences. These findings revealed an interactive nature between reading strategies, interest experiences and task difficulty. However, this study used a single-method measure for strategy use and interest experiences. Hence, the qualitative relationships could not be further described at depth.

From the review on reading interest and L2 reading, I found a great blank left to

be filled for future research. Brantmeier's study (2006) on situational interest has established a springboard to build upon. Therefore, this study will also focus on the sources of situational interest and readers' perceived interest and further examine how reading interest and strategy use influence L2 reading comprehension.

<u>Summary</u>

This section introduced three different types of reading interest: situational interest, individual interest and interest experiences. The relationships between interest, strategic processes and domain knowledge are depicted in the Model of Domain Learing (MDL) by Alexander (1997). Interest is described as an evolving variable as learners' strategy use and domain knowledge increase. In addition, many empirical studies also documented the effects of interest on L1 reading and L2 reading. This study will draw from Brantmeier's study in 2006 to investigate how sources of situational interest, readers' perceived interest and strategy use affect the quality of reading comprehension.

CHAPTER THREE: METHODOLOGY

Overview

This chapter presents the methodology of this study. It begins with a list of the major research questions regarding the roles of reading strategies and reading interest in L2 reading comprehension. Next, the research design is introduced. This section first describes the contextual characteristics of the school setting, where the research was conducted, including the geographical features and the typical English instruction in this school. Then, this section delineates the characteristics of the students who participated in the study, details of the instruments, and data collection procedures. The last section discusses how the qualitative data and the quantitative data will be analyzed and integrated to address the three research questions.

Research Questions

Based on the review of previous literature, the study develops three major research questions to address the gaps in current research on L2 reading. The three overarching questions are:

Research Question 1: What are the L2 reading strategies employed by eighth-graders identified from a self-report assessment and think-aloud protocols and how do the results from different assessments correspond to each other?

Research Question 2: What are the sources of interest in L2 reading for eighth graders and how do the sources of interest relate to readers' perceived interest?

Research Question 3: How do L2 reading strategy use, sources of situational interest and perceived interest relate to L2 reading comprehension?

Research Design

To answer the research questions, this study applies a multi-method assessment recommended by Veenman et al. (2006) and Cromley and Azevedo (2006) to research L2 reading strategy use and reading interest with eighth graders in Taiwan. The multi-method assessment is a within-time design with different measurements. The assessments for reading strategy use involve one concurrent measure, think-aloud protocols, one retrospective measure, a L2 reading strategy questionnaire, and two outcome measures for L2 reading comprehension.

For reading interest, this study uses retrospective interviews to explore the sources of situational interest and readers' perceptions of their interest experiences during reading. Moreover, two retrospective questionnaires are adopted to collect quantitative data. One is *Sources of Interest Questionnaire* by Brantmeier (2006) to measure sources of situational interest, and the other one is the *Interest Experience Scale* developed in my pilot study (Lin, 2009) to assess readers' perceived interest.

This multi-method design thereby collects both quantitative data and qualitative data. The details of the research context, participant selection, the reading material, the instruments, and data collection procedures will be outlined in the following sections.

Research Site

The junior high school where I recruited the participants is located in a rural town in the mid-southern part of Taiwan. This town occupies an area of 20 square kilometers with a population of less than 40,000 residents. The school is the only public junior high school in this town. This school enrolls students from Grade 7 to Grade 9, and has about 1300 students in total. As for the socio-economic status of the

students, according to the information from the teachers in this school, most of the students' parents work in small private-run business enterprises, manufacturing factories or as farmers. Generally speaking, the students in this school might not come from very wealthy families, but they are also not in financially-deprived situations. In short, I consider this school is representative of a mid-sized, rural public school in Taiwan.

In Taiwan, traditional lecture-based instructional method is dominant in most of the classrooms in rural schools, and this school is no exception. Based on my interviews with two English teachers in this school, they both indicated that teacher-centered, grammar translation method was the common English teaching method they used in class. In addition, the English instruction was mostly test-oriented, because ninth graders in Taiwan need to take a standardized, pencil-paper based large-scale examination called Basic Competence Test (BCTEST, Ministry of Education, 2001). The scores of BCTEST are used to determine students' entrance into prestigious high schools. Accordingly, to prepare students for this important examination, all the teachers in the school required their students to purchase a workbook which comprises practice exercises that resembled the test items in the BCTEST. Completing exercises in the workbook and giving students tests after teaching one unit in the English textbook became the routines in their English instruction.

Participants

The participants of this study were 36 students at eighth grade who spoke Mandarin as their first language. Students at this grade in Taiwan usually have received official English instruction for about five to six years. I chose eighth-graders

as the targeted student population for two reasons. First, from the literature review, most of the studies on L2 reading strategy use and reading comprehension focus on high school students, university students or adult learners, while the L2 learning process of junior high school students has rarely been researched and fully understood. Based on the Model of Domain Learning (MDL, Alexander, 1998), adult learners or university learners might be in a different stage from young learners, because they have more domain knowledge, world knowledge and stable personal interest. Therefore, it is questionable to generalize the results from the studies involving adult learners to younger learners. Hence, I want to put a specific emphasis on younger learners and identify the L2 reading strategy use in their L2 learning process so as to inform better teaching practice for this group of learners.

Secondly, according to the MDL (Alexander, 1997), eighth graders are usually at the stage of acclimation where they start to build up domain knowledge and cultivate learning interest in different school subjects. In other words, it is a stage where learners' cognitive process and interest are more malleable and responsive to the context than more matured learners. Therefore, their reading processes could reveal interactive dynamics between strategic processes, interest and the ongoing task in greater depth.

To obtain the most diverse protocols, I included both high-achieving L2 learners, average L2 students and low-achieving L2 learners. I asked their home teachers to provide me with the achievement status of each student and recruited the students whose English academic achievement ranks were on the top of 20%, between 40% and 60%, and between 60% to 80% in their classes. Considering that the English text in the think-aloud activity had a median difficulty for an average eighth grader, I did

not recruit students with really low English proficiency because they might encounter great difficulty at the word level and would not be able to go beyond the textbase for constructive comprehension. I also asked the home teachers to select the students who were more articulated in terms of their verbal ability in order to perform the think-aloud task. In addition, to double check their language proficiency, I administered one self-developed English proficiency test, the *TOEIC reading comprehension test,* before the students started the think-aloud task. This test will be introduced in detail in the section of instruments.

A total of 36 students participated in this study; 18 of them were males and 18 were females. The average age was 14.19. These students were selected from 4 different classes at the same grade in the junior high school. I intended to recruit a sample of students with mixed levels of English proficiency, so I used their most recent mid-term English examination scores and the *TOEIC reading comprehension test* results as the indicators of their English proficiency. The mean score for the mid-term English exam in this sample was 82.78 and standard deviation was 15.23. The mean score for the *TOEIC reading comprehension test* was 6.78 and the standard deviation was .2.63.

Whether the sample was normally distributed in terms of English proficiency could be judged by the statistics of Skewness and Kurtosis (Hair et al., 2005). Skewness is the measure of the symmetry of a distribution. Skewness values between the range of -1to +1 indicate a symmetric distribution. Kurtosis assesses the peakness or flatness of a distribution in comparison with a normal distribution. The ideal values of Kurtosis should be near zero.

For the sample of this study, on the English mid-term exam scores, the

Skewness was -1.753, and the Kurtosis was 2.62. On *TOEIC reading comprehension test*, the Skewness was .116 and -.730 for Kurtosis. These statistics suggest that the distribution of the English proficiency levels was slightly negatively skewed, indicating that the sample had more high-achieving students. This result was reasonable since I had asked the teachers to recommend me students with some minimum English proficiency in advance.

Materials

The students read one English text about chocolate. The original text was used in the pilot study, and I adapted it by integrating more information from the entry of chocolate in The World Book Encyclopedia (2008). It introduced different kinds of chocolate and compared the benefits of dark chocolate with white chocolate. It had a total of 341 words, which was longer than the original text used in the pilot study.

I used two criteria to construct the text: textual difficulty and topic familiarity. Because reading strategy use was one important variable in my study, I needed to design a task which enables me to observe students' reading strategy use. Previous literature suggests that it requires a certain level of difficulty in the task to induce the necessity of using reading strategies to solve the problems (Afflerbach et al., 2009; Chuang, 2007). If the text is too easy, then students can reach comprehension by using a preponderance of reading skills, which are automatized and unconscious. If the text is challenging, readers would be forced to think harder to search for possible solutions and take actions to execute the solutions. These moments are when reading strategies come into play during comprehension. Therefore, this text was designed to have a difficulty level beyond students' current reading abilities. This text has several English words that typical eighth-graders in Taiwan have not learned from textbooks

yet, such as "caffeine", "blood", or "cholesterol". The sentences in the texts are longer, and the syntactical structures are more complex than what an average eighth grader used to read in textbooks.

Secondly, I selected a familiar topic to the targeted readers. According to previous studies (e.g., Alexander et al., 1995), reading interest is associated with topic familiarity. Hence, a familiar topic could help induce students' situational interest during reading. This point was also confirmed in my pilot study. The topic of chocolate was rated as more interesting and more familiar to the students than the topic of popcorn in the pilot study, because the Taiwanese students have more personal experiences with chocolate. Therefore, I decided to use this topic for the present study.

Instruments

The instruments in the study include one English reading comprehension test, prior knowledge free recalls, think-aloud protocols, a strategy questionnaire and retrospective interviews. Table 3.1 offers the list of these instruments for reading strategy use and reading interest.

For L2 reading strategy use, there are four related instruments: (a) think-aloud protocols, (b) The *Cognitive-Metacognitive Strategy Questionnaire* by Phakiti (2003; 2005), (c) multiple-choice reading comprehension questions and (d) text recalls. For reading interest, the study employs three methods to assess sources of interest and perceived interest; they are (e) retrospective interviews, (f) *Sources of Interest Questionnaire* and (g) *Interest Experience Scale*. Each instrument will be introduced as follows.

Table 3.1. *The Instruments Used to Assess Strategy Use and Reading Interest*

English language proficiency	Outcome measure	*TOEIC English reading comprehension test*
		Mid-term English exam scores
L2 reading strategy use	Pre-task measure	Prior knowledge free recalls
	Concurrent measure	Think-aloud protocols
	Retrospective measure	The *Cognitive-Metacognitive Strategy Questionnaire (CMSQ)*
	Outcome measures	Multiple-choice comprehension questions
		Text free recalls
Reading interest (sources of situational interest and perceived interest)	Retrospective measure	Semi-structural interviews
	Retrospective measure	*Source of Interest Questionnaire (SIQ)*
	Retrospective measure	*Interest Experience Scale (IES)*

TOEIC English reading comprehension test

This measure is used as an indicator of the students' language proficiency levels. This test was adopted from one sample test of the TOEIC Bridge. TOEIC bridge is designed to measure beginning English learners' language proficiency in performing selected everyday language tasks (ETS, 2010). I could not administer the whole TOEIC Bridge text because the time I was allowed to distribute the test to the students was limited. Therefore, I chose 12 items from the reading comprehension section to form an English reading comprehension test (Appendix A). The internal consistency coefficient of this test is .72 (Cronbach's alpha = .72). This test also has high correlations with the students' achievement scores in their English mid-term

exam (r= .75, *p<.001*).

Prior knowledge free recalls

Prior knowledge recalls were collected by asking the participants to tell me anything they know about chocolate (the topic of the reading text) before the think-aloud task. The scoring procedure of this measure is to calculate the number of propositions in their reports (Valencia et al.,1991). In order to clarity the relationship between background knowledge and reading comprehension, I had two different scores for prior knowledge. The first one was termed as "Relevance of the Prior Knowledge (RPK)", obtained by calculating the number of the proposition in the students' reports which was also related to the content of the chocolate text in the reading task. The second score was used to determine the breadth of the prior knowledge, which was named as "Breadth of the Prior Knowledge (BPK)". This measure was obtained by counting the total number of the propositions in the students' reports, regardless of its relevance to the chocolate text.

Think-aloud protocols

I administered the think-aloud activity individually with each participant. The think-aloud activity included one practice phase and one task phase as suggested by Pressley and Afflerbach (1995). The practice phase aims to prepare students for the think-aloud task, because students might not be familiar with the process of reading their thoughts aloud in the presence of others.

First, the students were instructed to read the English text for general understanding as they normally do and verbalize whatever thoughts on their mind when they see the visual prompts (a red star) at the end of the sentences in the text (See Appendix B for training guidelines). Then, the students were told to read the

practice text (Appendix C). The practice phase had three steps. The first step was to demonstrate the think-aloud process to the participants myself using a sample text. The second step was to let the participants practice the think-aloud task themselves. The participants were given a short practice text to read and think out-loud during reading. The third step was to answer the participants' questions about the whole process and make sure they become more relaxed with the think-aloud task. During training, participants were reminded to think aloud with these reminders: "Please say what you are thinking" or "Don't forget to read out loud". I did not intervene even if students expressed word difficulty, misread words, or asked questions.

After the practice phase, the students started the think-aloud task with the target text on chocolate (Appendix D). The participants were given a pen and paper if they wanted to take notes. The think-aloud sessions were audio-taped and transcribed verbatim in Chinese.

Text free recalls

The participants were asked to orally report whatever information they remembered about the text as detailed as possible. They could use either English or Chinese. The scoring procedure to assess the students' text free recall protocols was based on the weighted propositional analysis by Brown and Smiley (1977). I, together with another senior doctorate student who specializes in reading research, divided the original text into 42 acceptable structural units (Appendix E) and then ranked the importance of the units from one to three depending on their salience to the main ideas of the text. One point was given to the units that had the least relevance to the main ideas, and three points were given to those with the greatest semantic importance. The inter-rater reliability of assigning points between the two

raters is .932 (Kendall's W= .932, Chi-square = 76.398, *p =.001*). An average point was computed for each propositional unit. Then, the students' text recall scores were calculated by examining the propositions in their recall protocols and assigning the points accordingly. The mean and standard deviation of this measure are 10.43 and 5.48.

Multiple-choice reading comprehension questions

The students were asked to complete one reading comprehension test when they finished reading (Appendix F). There were 8 questions in total; Four of them were textbase questions to which the answers could be directly found among the sentences (Question 1,4, 5, 8), and the other four were inference questions which required readers to integrate different information in the text to make inferences (Question 2, 3, 6, 7).

After examining the students' responses to the test, I found that only two persons answered item3 correctly and this item even did not correlate to the total score at the significance level. I also observed that from the think-aloud protocols, almost none of the participants could understand the meaning of this sentence," The higher the percentage, the darker the chocolate". Hence, it was logical that the students could not correctly answer this question if they did not have the knowledge about the relationship between the proportion of the cocoa and the color of the chocolate. Therefore, I took out this item from the test. The internal consistency for the 7 items is .327 (Cronbach's alpha = .327), which is not very satisfactory.

The Cognitive-Metacognitive Strategy Questionnaire (CMSQ)

This strategy questionnaire is constructed by Phakiti (2003, 2008) to assess L2 learners' actual reading strategy use after a reading task. According to his original

design, this questionnaire is composed of two strategy categories: cognitive strategies and metacognitive strategies (Appendix G). For the cognitive strategy category, the items are further classified as strategies for comprehending (i.e., I translated the text into my first language), retrieval-inference (i.e., I tried to guess the meanings of the unknown words by using contextual cues.) and memory (i.e., I reread some sentences several times when I felt I did not understand them). For the metacognitive strategy category, it also has three subcategories: planning (i.e., I planned what to do before I began my reading), monitoring (i.e., I knew when I lost concentration when reading.) and evaluation (i.e., I checked my comprehension during the reading process.).

In addition, the *CMSQ* is originally designed for silent reading tasks. However, in this study, the readers were asked to rate their strategy use for the think-aloud task, which was different from silent reading. Therefore, three items in the *CMCQ* were regarded as inappropriate to reflect the actual reading process and were taken out. These items were "I flipped through the reading task before I actually stated to complete it", "I marked or underlined important parts by using colored pens or drawing starts" and "I tried not to understand the content in a word-by-word manner". There were 27 remaining reading strategies in total. The participants were asked to rate their strategy use for the reading task on a 4-point Liker scale: 0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often).

Retrospective semi-structural interviews

To assess the sources of situational interest in the text, the technique of collecting verbal reports by Wade et al. (1999) was adapted. After the think-aloud task, I asked the participants why they thought this text was interesting or

uninteresting. I also asked them to indicate which part of the text was interesting or uninteresting and offer specific reasons. In addition, I also asked them to describe their interest feelings and the degree of concentration during reading (See Appendix H for the semi-structural interview questions).

Source of Interest Questionnaire (SIQ)

The *SIQ* is created by Schraw et al. (1995) and has been used by Brantmeier (2006) to measure L2 readers' situational interest in L2 reading. Originally, the *SIQ* has 17 items that fall into five dimensions. For this study, considering that participants might feel too overwhelmed to complete a series of questionnaires after the think-aloud protocols, I simplified the *SIQ* by choosing two items which had the highest factor loadings in Brantmeier's study (2006) for each dimension (Appendix I). For the dimension of emotiveness, only one item was selected because only this item was more appropriate to describe the text. The simplified version of *SIQ* has 9 items on a 4-point Likert Scale: 0 (Do not agree), 1(Partially agree), 2 (Largely agree), 3 (Totally agree).

Interest Experience Scale (IES)

I developed the *IES (*Appendix J*)* to assess readers' perceived interest based on the definition of interest experiences (Tsai et al., 2008). It has 8 items with two dimensions: feelings of control (i.e., I don't think this text is hard) and feelings of interest (i.e., I feel that this text is interesting). This measurement asks respondents to mark their interest experiences for a specific task on a 4-point Likert scale: 0 (Do not agree), 1(Partially agree), 2 (Largely agree), 3 (Totally agree). The scoring procedure is to add the responses across the 9 items to obtain a total score, which represents the strength of readers' interest experiences. A higher score represents stronger interest

feelings readers have experienced during reading.

I had examined the reliability and validity of the *IES* in an empirical study (Lin, 2009). In this study, the reliability of this instrument was satisfactory. The internal consistency index (alpha) for the overall scale was .844 and .896 for two English reading texts. The construct validity of the *IES* was examined through exploratory factor analysis using Principal Component Analysis. Two components were extracted. The item loadings on the two components corresponded to the theoretically-defined dimensions. In addition, the *IES* was shown to positively correlate with readers' comprehension scores. Hence, the *IES* was proven to be a reliable instrument with adequate validity.

Data Collection Procedures

The *TOEIC English reading comprehension test* was administered first to the students. Then, I used this score along with their English achievement rankings to identify ideal students and carried out the think-aloud tasks with the selected students individually.

In the task section, the students were firstly asked to verbally recall whatever knowledge they have about the topic, chocolate. Then, they participated in the think-aloud activity, including the practice phase and the task phase. After they finished the think-aloud task, I asked the participants to provide text recalls and then complete the reading comprehension questions for the text. Then, I conducted semi-structural retrospective interviews, asking the students to describe their thoughts about the sources of interest in the text, their perceptions of interest experiences and their attitude toward English in more detail. Afterwards, I had the students complete the *CMSQ*, the *SIQ* and the *IES*. The duration of these sessions with 36 students

ranged from 28.28 minutes to 43.17 minutes with an average of 35.06 minutes. The

data collection points for the think-aloud task are visualized in Figure 3.1 below.

Figure 3.1. Data Collection Before, during and After the Think-aloud Task
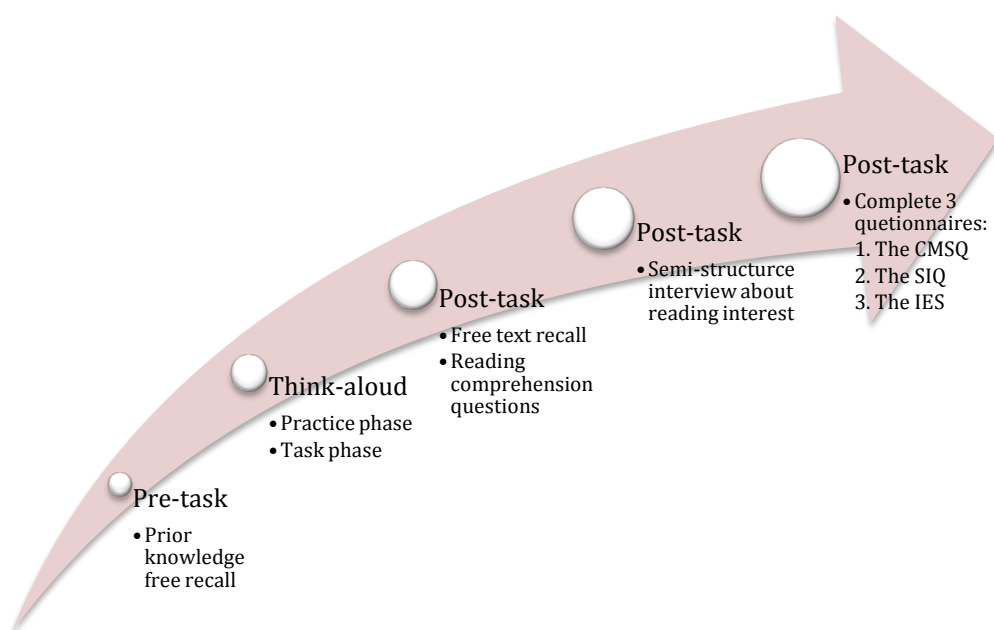
Data Analysis

Two kinds of data were collected: qualitative data from think-aloud protocols

and semi-structural interviews, and quantitative data from three questionnaires.

Hence, both qualitative analysis and quantitative analysis were applied to address the

three research questions. The section of qualitative analysis offers reports of how I

coded and analyzed the verbal data in the think-aloud protocols to identify 12 reading

strategies. Moreover, the process of analyzing the sources for reading interest in the

retrospective interviews is also described. Then, combining the data collected from different assessments, case analyses of learners' profiles are utilized to elucidate the relationships between reading strategy use, reading interest and reading comprehension.

The next section is quantitative analysis, where I explain the procedures of transforming the verbal reports into quantitative scores. I quantified the data from the think-alouds to derive three strategy scores. The three measures for reading strategy use are (1) *Quantity of Total Strategy Use*, (2) *Quality of Total Strategy Use*, and (3) *Sophistication of Strategy Use*. The scoring procedures of the three strategy measures will be explained in detail. Then, several statistical techniques employed for hypothesis testing are introduced. Lastly, a graph to depict the correspondence between the research questions and the collected data are presented.

<u>Qualitative Analysis</u>

Analyzing think-aloud protocols

Research Question 1 explores the specific L2 reading strategies employed by eighth graders. The think-aloud protocols collected on-line information of the students' strategic processes during reading. The verbal reports were transcribed verbatim into Chinese first. Then, the verbal data was coded for specific types of reading strategies.

There were four steps to developing the strategy coding system in order to analyze the verbal reports. The first step was parsing the verbal protocols into smaller, meaningful units for data coding. Because strategy use concerns readers' intentional and purposeful effort in responding and constructing meanings of the text (Afflerbach, 2008), I parsed the verbal protocols into "thought units" (Schellings et al., 2006)

rather than using linguistic clauses that contain only one verb. Thought units are

defined as the distinct remarks that contain one thought related to reading the text

(Schelling et al., 2006; Cote, Goodman & Saul, 1998).Using "thought units" will

better reflect the important components in a strategic activity that includes purposes,

reactions and behaviors. Thought units could be an utterance reaction to a text

sentence or several statements aiming to analyze and interpret the meaning of one

core sentence or the entire paragraph. The length of the thought units might vary.

Regardless of the length, each unit has one complete idea or reaction about the text or

the reading process.

These thought units were then coded for the types of strategies involved. I

identified the strategies from the transcripts and classified them into the coding

system. I also added more categories in the coding system until this system could

account for all verbalizations. Each strategy described the readers' behaviors or

salient activities as they were reading the text.

The second step was to construct and describe the labels in the strategy coding

system. I used the coding system developed from the pilot study (2010, Lin). This

coding system is based upon the strategy categorization system in Schellings et al.

(2006), Pressley and Afflerbach's summary of readers' on-line think-aloud strategy

reports (1995), and the strategy items in the L2 reading strategy questionnaire, the

Cognitive-Metacognitive Strategy Questionnaire (CMSQ, Phakiti, 2003; 2008).

The third step addressed the concerns about the reliability and validity of the

coding procedure. After constructing the coding system, I invited one researcher who

also specializes in ESL/EFL reading to code the verbal protocols using the same

coding system. After the definitions of the strategies were explained and

demonstrated, the rater independently coded the 9 students' transcripts. This was one forth of the total protocols, including 265 thought units. 89.78% of the remarks were coded identically between the two raters. Inter-rater reliability was computed and Cohen's Kappa was .805 (*p<.001*), which was satisfactory. I also discussed the remarks that were coded differently with the rater and was able to reach final agreement.

The final coding system reveals two major strategy categories: comprehension strategies and metacognitive strategies. The definition of comprehension strategies is based on Kintsch's Constrution-Integration model (1998; van Dijk & Kintsch, 1983), which refers to identifying words, changing and manipulating the language to construct meanings from the text. In this analysis, I identified 10 comprehension strategies. Four of these strategies relates to textbase construction, including translating the sentences into Chinese and analyzing words or sentences to determine the literal meanings. The other six comprehension strategies relates to the processes to elaborate the textbase model and derive a more integrated and coherent representation of an idea. These strategies include clarification, summarizing important messages, adding additional explanations based on the readers' prior knowledge and drawing inferences across the sentences to understand causal relationships among the ideas.

The metacognitive strategies draw upon the theoretical framework of self-regulated learning. These strategies are used when readers plan, monitor, and evaluate their ongoing performance to accomplish the cognitive goal (Dole, Nokes, & Drits, 2008; Phakiti, 2003; 2008). In this study, the comprehension-regulating processes involve comprehension monitoring and planning solutions to solve

problems.

To sum up, a total of 12 reading strategies are identified based on all of the verbal reports as shown in Table 3.2.

Table 3.2. *The Strategy Coding System*

C=Comprehension Strategies M=Metacognitive Strategies

Code	Label	Description
C1	Word-by-word translation	The readers tried to translate all, or most of the English words in a sentence into Chinese.
C2	Paraphrasing	The readers selectively translated part of the sentences and paraphrased the sentence using words that are more familiar or simpler in order to hold the meanings in working memory. For example: Original sentence*: The best kind of chocolate is dark chocolate with 70% of cocoa.* "This is about dark chocolate being the best because it has more pure ingredients." Original sentence: Eating chocolate can also make us feel happy, because dark chocolate has caffeine. "Because dark chocolate has something, and that thing can help us, very happy."
C3	Determining an unknown word's meaning by using contextual cues or linguistic cues	The readers used the contextual cues to infer the meanings of the unknown words, including titles, pictures and the other known words in the sentences. For example: Original sentence: *This is a Spanish word, meaning "hot water".* "I guess this word means a country." Original sentence: *We know high cholesterol can cause heart diseases.* "What is this…I don't know..*can*…Does this word mean heart?"

		Original sentence: *Cocoa butter has very little caffeine, so white chocolate doesn't' have as much caffeine as dark chocolate.* "..the same…I think it is the same…because here it says *as much as*..Yes, it means the same."
C4	Determining the meaning of a sentence by using contextual cues	The readers encountered unknown words in a sentence and used contextual cues, such as pictures or other known vocabulary in or across the sentences, to infer the overall meaning of the sentence. For example: Original sentence: We know high cholesterol can cause heart diseases. The antioxidants in chocolate can lower the cholesterol in our blood, so eating some chocolate can prevent heart diseases. "We know high…this can…can change the mood..I think this means a change here." Original sentence: *White chocolate has cocoa butter, sugar, and milk but no cocoa solids.* "Chocolate..milk something, It might be saying something about flavors."
C5	Elaborating on the text	The readers drew additional information related to text content from their prior knowledge as a way to bridge the text content with their schema of the topics. For example: "Doesn't coffee taste bitter also?" (Being bitter is not in the original text) "I think about chocolate being melt down [by hot water] and then become solid again" "I think about deoxidants. We are learning it now"
C6	Summarizing	The readers identified the important messages across several sentences and provide a summary to synthesize them. For example: " I think it mainly talks about things related to

		chocolate. Too much chocolate will make people fat, and it has both advantages and disadvantages." "Dark [chocolate] is better than white [chocolate]."
C7	Evaluating and responding to text content	The readers made judgments and gave personal comments on the information in the texts, including acceptance or disagreement by comparing the text with their prior knowledge, personal experiences or attitude. For example: "It looks terrible!" "Thirty calories…It should be a normal amount to eat [chocolate] every day."
C8	Generating explicit inferences based on text content	The readers made explicit inferences from the information in text content or formed causal relationships by combining the ideas in two or more sentences For example: "People in a hot place will like to eat chocolate." "Because chocolate is originally bitter, so I guess adding some sugar can make kids like to eat it more." "So we should eat less chocolate."
C9	Clarifying unclear information in text	The readers tried to clarify the ideas in the text by self-questioning about the content being read or creating a mental image about the content. For example: " Really? Chocolate can really enhance attentiveness?" "I am thinking, how big could a thirty-kilogram chocolate be?"
C10	Making forward inferences about the content or text structures	The readers predicted what the upcoming information in the text would be based on keywords or textual structures. For example: "I guess it will then tell us the good things and the

		bad things about dark chocolate".
M1	Monitoring the comprehension coherence or difficulty level	The readers detected that they had incoherent understanding or lack of understanding about the information in the texts. For example: " This should mean becoming fat, No...It should mean heart." "This is so hard."
M2	Planning on executing solutions to solve problems	The readers explicitly decided what to do next when encountering difficulties, such as skipping the sentences or going back to reread again. For example: " Hot water? Hot water? What does it mean? I think I will skip it and maybe later I will know what it means." "I want to read forward and try to see if I could connect these."

Note. Italics are used when the readers produced these words in English during reading

The final step was to interpret the strategy categorization results. More detailed explanations of each strategy will be offered in Chapter Four. Systematic patterns and emerging themes that could address the research question are also noted.

Analyzing retrospective interviews

Research Question 2 asks about the nature of sources of situational interest and perceived interest during L2 reading. The retrospective interviews were conducted to obtain detailed information about the sources of situation interest and readers' perceived interest in the given text. I followed the procedures used in Wade et al. (1999). The analysis process was similar to the way how the think-aloud protocols were analyzed. The oral responses were transcribed verbatim in Chinese first. I used

an initial coding matrix based on the five sources of interest (i.e. importance/value, prior knowledge, unexpectedness, ease of comprehension and writing styles) in Wade et al. (1999) to code the responses for sources of interest or sources of non-interestingness. Additional categories of sources of interest were created to accommodate all of the data. After the classification matrix was completed, I compared the matrix with students' responses on the *SIQ* and *IES* for data triangulation. The coding matrix and the common themes will be presented and interpreted in the chapter on qualitative results.

Profiling the L2 readers based on language proficiency, reading strategy use and reading interest

Research Question 3 focuses on interactions between reading strategy use and reading interest on L2 reading comprehension. In the studies by Alexander and her associates (e.g, Alexander et al., 1995; Alexander & Murphy, 1998), they profiled learners' performance differences on the three major variables of the MDL: domain knowledge, interest and strategy processing using the statistical technique, cluster analysis. However, this quantitative methodology is limited in uncovering the minute nuances and dynamics during the interactions among these factors. Hence, it provides less insight on how each element interrelates and contributes to learners' expertise development.

The current study, therefore, attempts to present L2 learners' profiles with respect to their differences in reading strategy use, reading interest, and language proficiency using both quantitative data and qualitative data. Based on the students' English achievement scores, think-aloud data, interviews and the questionnaire responses, three learners' profiles were presented and described. These learners

represent three kinds of L2 readers: (1) High language proficiency, high reading interest and strategy use at a deeper level, (2) Lower language proficiency, high reading interest and strategy use at a superficial level, and (3) High language proficiency, low reading interest and strategy use at a superficial level. The readers' profiles could allow us to inspect the dynamic interplay of the cognitive and non-cognitive factors and depict the multidimensional nature of L2 reading process.

Quantitative Analysis

Developing strategy measures for the CMSQ and the think-alouds

To address Research Question 1, I firstly examined the factor structure of the *CMSQ* using exploratory factor analysis (EFA). The quantitative analyses were conducted via the statistic software, SPSS 17.0. A factor is derived through a linear combination or a cluster of inter-related observed items that represents a specific underlying dimension of a construct (Pett, Lackey & Sullivan, 2003). Factor analysis is often applied for developing theories or assessing construct validity of an established instrument. With EFA, the factor structure of the *CMSQ* could be used to represent the underlying strategy categories assessed by questionnaires (Chuang, 2007).

Two different methods were employed to measure reading strategy use in this with-subject, multi-method assessment design: the *CMSQ* and think-aloud protocols. This section reports how L2 reading strategy use from the think-aloud protocols was scored for quantitative analysis. I adapted the procedures in the studies by Desoete (2008) and Veenman et al.(2005) to calculate three types of think-aloud reading strategy use scores for each participant: (a) *Quantity of Total Strategy Use*, (b) *Quality of Total Strategy Use*, and (c) *Sophistication of Strategy Use*. The detailed

information about the scoring processes is presented as follows.

Quantity of Total Strategy Use. This measure is obtained by summing the frequency counts in the 12 strategy categories coded for each participant in their think-aloud protocols. The sum of total strategy use represents the quantity of total strategy use.

Quality of Total Strategy Use. The second measure is a quality measure to judge the overall quality of the readers' strategic performance. This measure assesses how effortful or mindful the readers use the strategies to achieve comprehension or solve reading problems. It is noted that the quality of strategy use does not only depend on the outcome of the strategy use, but should also consider the depth of the process when the strategy is carried out (Veenman et al., 2005; Veenman et al., 2003; Veenman & Beishuizen, 2004). Since strategies, by definition, are learners' deliberate, intentional, and resourceful attempts to control and modify their efforts to achieve the desired goal (Afflerbach et al., 2008; Dole et al., 2008; Cohen, 1994; Oxford, 2011), the emphasis of the strategy assessment should be on the quality of learners' performance of these processes. For instance, if a reader uses a predicting strategy thoughtfully and purposefully to make forward inferences, the inferences might be coherent and logical, but do not correspond to the original messages in the text. He would still score high on the quality measure of strategy use because the assessment also values the degree of sophistication in the process of generating a prediction.

The scale to measure the quality of strategy use aims to distinguish strategies that are processed at the surface level from those at the deeper level (Veenman & Beishuizen, 2004). One point is given to a present strategy used superficially with less effort in achieving its goal. By comparison, two points are given if the strategic

action is relatively more complete, more deliberate, and well-executed to overcome a comprehension problem or enriches understandings of the text.

For example, the two verbalizations below are both classified as the reading strategy, "Determining the meaning of a sentence by using contextual cues".

Verbalization 1:

What does this mean? *Chocolate only has*…, maybe this chocolate only has this and that.

Verbalization 2:

This sentence says that chocolate is probably made from a …*seed*, a seed.. so it is probably…probably made from a kind of a tree.

(*Note*: Translated into English from Chinese, except for that the words in Italic are produced originally by the readers in English during reading)

On the scale for quality of strategy use, the first remark receives one point and the second remark receives two points. The first remark shows that the reader was aware of the presence of an unknown word, but did not make an effort to infer the meanings of the word. Instead, he used words like "this" and "that" to substitute the unknown words and then go on to the next sentence without actually solving the word problem.

The second remark, on the other hand, represents a more complete and thoughtful action to infer the meaning of the whole sentence using contextual cues. The reader used the known word "seed" as a contextual cue and inferred that the

unknown word "cocoa" could be a tree. Therefore, through comparison, the first

remark is given one point as a strategy was used at a more superficial level and the

second remark is given two points to reflect the reader's deeper involvement and

attention in strategic processing.

To provide a clear overview of the criteria used in the quality scale to score each

strategy, Table 3.3 below offers detailed behavior descriptions or decision rules with

example verbalizations of 1 point and 2 points based on the 12 strategy categories.

Table 3.3. *The Descriptions with Example Verbalizations for Each Strategy to Illustrate the 2-point Quality Scale for L2 Reading Strategy Use*

Strategy Label	Behavior Description and Examples
Word-by-word translation	1 point The readers identified only a few words in a sentence and translated those words into an incoherent and broken Chinese sentence. Example: Original sentence: *The word, chocolate comes from chocolatl. This is a Spanish word, meaning "hot water".* " hot water…this world…chocolate..from..That's it." 2 points The readers identified most of the words in a sentence and provided a complete, coherent and word-for-word Chinese translation. Example: Original sentence: *Eating chocolate can also make us feel happy, because dark chocolate has caffeine. Caffeine can help us have good feelings, such as happiness and attentiveness.* "Dark chocolate has…is that happiness? Coffee can make us have good feelings, such as happiness and attentiveness."
Translating by paraphrasing	1 point The readers skipped unknown words, translated part of the sentences, and generated a grammatically-correct, but

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	simplified version of the original sentence in Chinese. Example: Original sentence: *Much of the chocolate which we eat today is sweet chocolate, combining chocolate with sugar. White chocolate has cocoa butter, sugar, and milk but no cocoa solids.* "It says that chocolate, its ingredients only have this and that. It says a lot of chocolate is sweet, and then white chocolate only has this and that." **2 points** The readers identified the complete meaning of the sentence and rephrased the sentences using their own words, instead following the original words or structure of the English sentence. Example: Original sentence: *Cocoa butter has very little caffeine, so white chocolate doesn't' have as much caffeine as dark chocolate.* "It says that cocoa butter has very tiny caffeine, so white chocolate does not have a lot of caffeine. If compared with the dark chocolate, it does not have a lot."
Determining an unknown word's meaning by using contextual cues or linguistic cues	**1 point** The readers detected a need to figure out the meaning of an unknown word, but did not try to solve the word problem or utilize sufficient contextual cues or linguistic cues to infer the meaning Example: "I think the word *kiss* means something else, but I forget what it would be." **2 points** The readers detected a need to figure out the meaning of an unknown word and utilized different clues, such as contextual cues or linguistic cues to infer the meaning. Example: "..the same…I think it means the same…because here it says *as much as*..Yes, it means the same." "Chocolate is made from something called *coco…cocoa*, from a kind of tree, when it is growing..and then we make chocolate from these

	seeds."

Determining the meaning of a sentence by using contextual cues	1 point
	When reading a sentence with too many unfamiliar words, the readers tried to infer the meaning of the whole sentence by utilizing contextual cues, but the inference was illogical or they just skipped the unknown part.
	
	    Example:
	    "What does this mean? *Chocolate only has…*, maybe this chocolate only has this and that."
	
	2 points
	When reading a sentence with too many unfamiliar words, the readers made a logical and thoughtful inference about the general meaning of the whole sentence based on the contextual cues from other known words.
	
	    Example:
	    "This sentence says that chocolate is probably made from a …seed, a seed.. so it is probably…probably made from a kind of a tree."

Elaborating on the text	1 point
	 The readers drew additional information from their prior knowledge which was less related to the text content or the readers did not indicate how this additional information was connected with the text.
	
	    Example:
	    "I think about chocolate being melt down [by hot water] and then become solid again"
	    "I think about deoxidants. We are learning it now"
	2 points
	The readers drew additional information from their prior knowledge and demonstrated how the information was connected to the ideas in the text.
	
	    Example:
	    "Some chocolate is especially bitter, right? Dark chocolate must taste bitter."

Summarizing across sentences	1 point The readers provided a rather generalized and short statement

	to summarize across the sentences. Example: "In the previous paragraph, it is talking about white chocolate. Now here… its' all about chocolate." **2 points** The readers provided a more detailed summary to synthesize various ideas across several sentences. Example: "Here it is talking about the chocolate's origin, the production process and what things it can be made into." " I think it mainly talks about things related to chocolate. Too much chocolate will make people fat, and it has both advantages and disadvantages."
Evaluating text content	**1 point** The readers gave a short evaluative comment to express personal attitude toward the content without further explanations. Example: "It looks terrible!" "That's right. I feel exactly the same way." **2 points** The readers gave a more thoughtful or detailed comment on the content by giving more explanations or comparing the text with their prior knowledge, personal experiences or attitude. Example: "It looks horrible. Something in our blood..That sounds strange and not right." "Thirty calories..It should be a normal amount to eat [chocolate] every day."
Drawing explicit causal inferences	**1 point** The readers made a less plausible or less coherent inference from the information in a sentence or from combining the ideas in two or more sentences. Example: "People in a hot place will like to eat chocolate."

	"Because white chocolate has less caffeine, so it tastes okay."
	2 points
	The readers made a more relevant and logical inference from the information in a sentence or from combining the ideas in two or more sentences.
	Example:
	"Because chocolate is originally bitter, so I guess adding some sugar can make kids like to eat it more."
	"So we should eat less chocolate."
Clarifying the information in text content	**1 point**
	The readers tried to clarify the ideas in the text by raising a question about the content without further elaborating the question or providing a solution.
	Example:
	"Why is chocolate hot?"
	" Really? Chocolate can really enhance attentiveness?"
	2 points
	The readers tried to clarify the ideas in the text by raising an elaborated and logical question related to the content being read.
	Example:
	"I am thinking, if what it says is right…chocolate, ..eating chocolate would become like that, the situation should be different for different people, right?"
Making forward inferences about the content or text structures	**1 point**
	The readers tried to make a general prediction about what the upcoming information in the text would be.
	Example:
	"I don't want to read forward because it might say something bad about chocolate."
	2 points
	The readers made a more precise prediction about the upcoming information by indicating the contextual cues or text structures for such predictions.
	Example:
	"It has told us the good things about chocolate. I think the last

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	paragraph should be saying..chocolate also has bad side."
Monitoring the comprehension coherence or difficulty level	**1 point** The readers detected that they have incoherent understanding or difficulty in understanding the text. Example: "This is so hard." " This should mean becoming fat, No..It should mean heart." **2 points** The readers detected incoherent understanding and pointed out the specific part that caused the confusion. Example: "I don't understand. The blood sugar should go up. Why does here it say it will go down?"
Planning on executing solutions to solve problems	**1 point** The readers decided what to do next when encountering difficulties without further explanations or monitoring. Example: "I want to skip to see if the next part is relevant." **2 points** The readers decided what to do next when encountering difficulties and indicated rationales for his/her decision. Example: "I skip here because I am not sure what it means, so I want to just skim it through. I think later it might tell us more important things. Here it just wants to briefly mention about chocolate and calories."

Sophistication of Strategy Use. In addition to applying the two scoring procedures described earlier, I further invented a third measure, named "*Sophistication of Strategy Use*". It is obtained by dividing the total quality scores by the quantity scores for each reader. This measure therefore gauges the average degree to which the readers complete a strategic action as reflected in the verbal reports. This measure is taken as a means to indirectly evaluate readers' abilities to initiate a

strategic action and carry it out effortfully and thoughtfully. The readers' scores on this measure range from 1 to 2. The closer a score is to 2, the more complete and thorough a reader is in executing a strategy to achieve comprehension.

The study assumes that the measure, *Sophistication of Strategy Use*, could capture readers' engagement within the strategic processing more accurately than *Quality of Total Strategy Use*, which has been used extensively in the studies by Veenman and his associates (Veenman et al., 2005; Veenman et al., 2003; Veenman & Beishuizen, 2004). If examined closely, the quality measure for total strategy use is still partially determined by the total number of strategies that appeared in the protocols. If a reader is more loquacious and thus generated longer protocols, even though his/her strategic processes are less complete or shallow, he might still get higher quality scores from the sum of the frequencies of total strategy use than a reader who is more reserved and produce fewer protocols but executes every strategy at a deeper level. Therefore, *Quality of Total Strategy Use* might not be sufficient to assess the level of depth in readers' mental processing of the strategies.

By contrast, the measure, *Sophistication of Strategy Use*, is derived as a ratio between the quality score of total strategy use and the quantity score of total strategy use. It represents the average quality points the reader receives for each strategy. Hence, it is independent of the absolute quantity of total strategy use. The study argues that this new measure might better assess how effortful and intentional the reader is to carry out each strategy and could also be highly related to L2 reading comprehension. This assumption will be also examined in the following statistical analysis.

It should be emphasized that think-aloud protocols still have limitations in

retrieving the entire account of readers' strategic processing in short-term memory (Pressley & Afflerbach, 1995; Ericson & Simon, 1993). Readers' verbal reports might inherently lack completeness of their actual strategic processing due to individual differences' in retrieving and vocalizing inner thoughts or mental behaviors. Hence, the measure of sophistication in strategic processing could only represent the relative effort the readers devote in the reading process and the relative completeness of strategy use gleaned from the think-aloud protocols.

Correlations and multiple regressions with the quantitative measures

Research Question 1 asks whether results from different assessments correspond to each other. Therefore, Pearson correlation analyses were carried out to estimate the convergence among the strategy measures from the think-aloud protocols and the *CMSQ*. In addition, the interrelationships between strategy use measures and the reading comprehension measures, including multiple-choice reading comprehension questions and text free recalls, were also estimated and reported.

Research Question 2 concerns how the sources of situational interest relate to readers' perceived interest. To answer this question, the latent variables revealed from the *SIQ* and the *IES* were analyzed using exploratory factor analyses. Then, Pearson correlation analyses were conducted to examine the correlations among the latent variables of the *SIQ* and the *IES*.

In addition, multiple regressions were further applied with interest experiences as the dependent variable and sources of situational interest as the predicting variables. Multiple regression analysis is the statistical tool to conduct prediction by estimating the variance of the dependent variable accounted for by a linear combination of the independent variables (Hair et al., 2005). The regression

coefficients, such as such as magnitude, sign and statistical significance, of each independent variable will reflect the effects of the independent variables on the dependent variable. The total variance explained by the independent variables could be evaluated by using the coefficient of determination, R^2. Using multiple regressions, I examined what sources of situational interest could better account for L2 readers' interest experiences.

Research Question 3 discusses the influences of reading strategy use and reading interest on reading comprehension. First, Pearson correlations were applied to inspect the interrelationships among the think-aloud strategy use score, the *CMSQ,* the reading comprehension scores, the *SIQ* and the *IES*.

Then, to compare the relative influences of reading strategy and reading interest on reading comprehension after readers' language proficiency is accounted for, I used hierarchical regression models with language proficiency, strategy use score , the *SIQ* and the *IE*S as the independent variables respectively and the reading comprehension scores as the dependent variable. With hierarchical regressions, the unique contribution of each independent variable could be examined by checking whether the change of R^2 is statistically significant as the independent variable is entered into the regression equation as one block. The significant increased R^2 indicates whether the independent variable add a significant portion of variance to explain the total variance of the dependent variable (Pedhazur, 1997).

The research design and the data analysis procedures are illustrated in Figure 3.2.

Figure 3.2. The Multi-method Design and Data Analysis Procedures

Research Question 1

Quantitative data

- Think-aloud strategy measures The CMSQ Multiple-choice comprehension questions Text free recalls
  ◇ Exploratory factor analysis　Pearson correlations

Qualitative data

- Think-aloud protocols
  ◇ Coding scheme　inter-rater reliability

Research Question 2

Quantitative data

- The SIQ The IES
  ◇ Exploratory factor analysis　Pearson correlations

Qualitative data

- Retrospective interviews
  ◇ Classification matrix

Research Question 3

Quantitative data

- Strategy use scores　Multiple-choice comprehension questions　Text recalls　The SIQ　The IES
  ◇ Pearson correlations　Hierarchical regressions

Qualitative data

- Think-aloud protocols　Retrospective interviews
  ◇ Profiling L2 learners on language proficiency, reading strategy use and reading interest

Cross Comparison

Cross Comparison

Cross Comparison

Data integration and interpretation

CHAPTER FOUR: RESULTS

This chapter reports the results of quantitative analysis and qualitative analysis to address the three research questions:

Research Question 1: What L2 reading strategies are employed by

eighth-graders identified from a self-report strategy assessment and

think-aloud protocols, and how do the results from different assessments

correspond to each other?

Research Question 2: What are the sources of interest in L2 reading for eighth

graders and how do the sources of interest relate to readers' perceived

interest?

Research Question 3: How do L2 reading strategy use, sources of situational

interest and perceived interest relate to L2 reading comprehension?

This chapter is divided into two parts; Part A presents the quantitative results and Part B reports the qualitative results to address the major research questions. Each part will be introduced as follows.

PART A: Quantitative Results

The following sections report the quantitative results to respond to the three research questions. In each section, I briefly introduce the statistical analytical procedures I employed first. Then, I describe the quantitative results in more detail. The main findings from these statistical analyses are summarized in the last section of this part.

Research Question 1 on L2 Reading Strategy Use

The first part of analysis answers Research Question 1, focusing specifically on

the strategies identified in the self-report measure, the *Cognitive-Metacognitive Strategy Questionnaire (CMSQ)*. The underlying factor structure of the *CMSQ* was analyzed using exploratory factor analysis. The reduced item structures could also serve as a means for data triangulation to compare the results in the qualitative analysis.

Next, the correlation between the three strategy measures from the think-alouds and the self-report strategy questionnaire, the *CMSQ*, were analyzed to inspect the degree of convergence among these different strategy assessments.

Research Question 1.1. What L2 reading strategies are employed by eighth-graders identified from a self-report strategy assessment?

To answer this question, the study analyzes the underlying factors of the strategy questionnaire, the *CMSQ*. This questionnaire measures the strategic competence in L2 reading through 27 cognitive and metacognitive items related to learners' reading behaviors or mental procedures. The reliability for the *CMSQ* in the study is obtained by internal consistency index, Cronbach's alpha, which is .90 at the significance level of .001. Construct validity is examined through exploratory factor analysis. The principal component analysis with quartimax rotation method is conducted and the factors with eigenvalues greater than one are extracted based on the Kaisser-Guttman rule (Pett et al., 2003). It reveals 8 factors accounting for 77.60% variance in total.

The items loaded higher on one factor compared to the other factors are considered to be placed in that factor. As for the items with similar loadings across the eight factors, the decision is made based on the theoretical and conceptual connections with other items on a certain factor. The factor structure and the corresponding items are listed in Table 4.1 below.

Table 4.1. *Factor Structure of the Cognitive-Metacognitive Strategy Questionnaire*

Factor	Item	Content	Loading
Factor 1: Text comprehension strategies (Mean/SD= 2.72/ .73)	13	I related the information from the text or tasks to my prior knowledge or experience.	.81
	15	I summarized the main information in the text.	.80
	8	I identified or guessed meanings of unknown words using context clues.	.76
	12	I guessed meanings of unknown words using root words.	.71
	5	I knew what to do if my intended plans did not work efficiently while completing this reading task.	.69
	18	I know which information was more or less important.	.68
	27	I immediately corrected my misunderstanding when found.	.67
	29	I reread the sentences several times when I came across conflicting information.	.61
	19	I applied my learned grammar rules while reading and completing the reading task.	.61
	26	I checked if I was reading the important ideas of the text.	.61
	11	I analyzed what the author meant or tried to say in the text.	.55
	20	I knew when I lost concentration during reading.	.52
	23	I asked myself if I understood the content constantly during reading.	.50
Factor 2: Elaboration strategies (Mean/SD= 3.18/.88)	10	I tried to interpret hidden ideas/meanings in the text in my own words	.91
	16	I paraphrased the sentences during reading in my own words to better understand what it said.	.88
	14	I translated the text, tasks, or questions into my first language.	.60

Factor 3: Coherence monitoring strategies (Mean/SD=2.96/.82)	6	I tried to understand the relationships between ideas in the text.	.77
	25	I checked my own performance and progress as I moved along the reading.	.73
	2	I used the title or pictures to guess what I would read.	.63
Factor 4: Planning strategies (Mean/SD=2.04/.91)	22	I paid attention to how much time I have spent and how much time I still have during reading.	.76
	4	I made sure I understood what had to be done and how to do it.	.70
Factor 5: Time monitoring strategies (Mean/SD= 2.83/.71)	24	I knew when I should read or complete the reading more quickly or carefully.	.67
	17	I reread texts or tasks several times when I felt I did not understand them.	-.55
Factor 6: Predicting strategy (Mean/SD= 2.33/.89)	9	I thought what the author was going to say or what was going to happen next while I was reading the text.	.79
Factor 7: Goal-setting strategy (Mean/SD= 1.83/.94)	3	I had set up a goal for this reading task before reading.	.77
Factor 8: Emotional response (Mean/SD= 3.19/1.06)	28	I knew when I felt worried, tense or unmotivated during reading.	.95

Total variance explained: 77.60%

Cronbach's alpha: .90

Mean/SD = 2.64/ .52

The first factor, text comprehension strategies, has 13 items with factor loadings ranging from .50 to .81. This factor explains most of the total variance (27.40%). This factor contains a set of strategies applied to decode English words, retrieve the literal meaning of a sentence or a phrase, and monitor metacognitively this

meaning-construction process. Most of the strategies pertain to the processes of building up textbase models, such as guessing word meanings using root words and using grammar rules. In addition, this factor also has strategies related to identifying main ideas of the text, such as selecting important information and analyzing the author's intention. These strategies are pertinent to establishing literal understanding of the text, based on which some further inferences could be drawn. The Cronbach's alpha of this subscale is .92.

The second factor, elaboration strategies, consists of 3 strategy items with factor loadings higher than .596. These three highly-related strategies involve translating the sentences into Chinese and reinterpreting the meaning through paraphrasing. This process is associated with how L2 readers combine the literal meaning of the text with their background knowledge using more familiar L1 words during the read-aloud process. The Cronbach's alpha of this subscale is .84.

The third factor is named "coherence monitoring strategies" because the strategy items loaded high on this factor are used particularly to ensure a cohesive understanding of the text. Examples of this type of strategies in this category are: understanding the relationships among different ideas and checking performance and progress during reading and using text titles or pictures to draw inferences. Hence, this factor is characterized by how readers try to generate inferences among the ideas in the text, check whether their understanding is coherent, and make use of titles or pictures as contextual cues for further inferences. The Cronbach's alpha of this subscale is .80.

The fourth and fifth factors have only two items and they are associated with readers' metacognitive strategies for monitoring the general reading process. The

fourth factor, planning strategies, comprises strategies about making plans based on the available reading time and decision on a working method to solve comprehension problems. These strategies help readers identify the available resources they have and map out a plan to complete the reading task. The Cronbach's alpha of this subscale is .76.

The fifth factor, time monitoring strategies, involves drawing attention to reading time allocation properly. It should be noted that item 17, "I reread texts or tasks several times when I felt I did not understand them" has a negative factor loading (-.549). It could be speculated that readers might be aware that the process of re-reading to solve word-level problems takes up too much of their time and thus is not helpful for them in managing their reading time effectively.

The sixth, seventh, and eighth factors contain only one item that is loaded high. The item in Factor Six is related to making forward inferences about the text based on what's been read. Therefore, it is named "predicting strategy". From the think-aloud protocols, it is also found that prediction is a rarely used strategy by these readers, which explains why this item stands by itself as one single factor.

The item in Factor Seven is setting a clear goal for this reading task, so it is called "goal-setting strategy". In effect, compared to a silent reading task, the structure of this think-aloud task might not allow the readers too much time to plan and think about how to approach the text at the beginning of the task. Thus, this strategy is not found in the think-aloud protocols and is also not related to other strategy items in the factor analysis.

Factor Eight is named as "emotional response", containing one item which describes how readers detect their emotional changes during reading. Because there

are no other items related to regulating emotion or other affective responses except for item 28 in the *CMSQ*, it is reasonable to have this item comprising a single factor due to its different conceptualization from other factors. In addition, this item only represents readers' awareness of their emotional state without further actions, plans or efforts to deal with this emotional response. Hence, this factor could not represent a strategic activity and is named as a response to readers' emotional fluctuation.

In conclusion, the exploratory factor analysis of the *CMSQ* reveals a factor structure which is apparently different from the original factor structure in the studies of Phakiti (2003; 2008). The primary reason could be that the task used in this study is a think-aloud reading activity, which is by nature, different from the silent reading task in the studies of Phakiti. To respond to different task demands in various reading contexts, it is necessary for readers to adapt different strategies or engage in a different sequence of strategy use.

In the case of think-aloud reading, I observe that the readers tended to decode the meaning of the sentences first, based on which some further inferences were made or the following actions could be determined to solve the problems occurred through constant metacognitive monitoring. This strategy sequence might be repeated as the readers move on to the next sentence. Because these strategic processes are usually initiated concordantly, it might be harder to differentiate cognitive strategies from metacognitive strategies in a think-aloud task than in a silent reading task as readers reflect back on these processes when completing the questionnaire. This might explain the entangled factor structures of the *CMSQ* in this study.

To sum up, the result of factor analysis shows that the primary activity during think-aloud is a combination of cognitive strategies and metacognitive strategies. The

literal meaning of the L2 text is studied, from which grammar rules are decoded, meanings of unknown words' meanings are inferred, and conflicting information is checked. Other minor strategy factors related to the deeper understanding of the main ideas implicated in the text, such as elaborations and coherence building, are also revealed. In addition, several factors specifically related to metacognitive activities, such as planning for the task and monitoring time during the task, are identified as well.

Although the factor structure of the *CMSQ* does not follow that of a silent reading task as used in previous studies(e.g., Phakiti, 2008; Chuang, 2008), it still roughly aligns with the theoretical account of L2 reading processes that textbase strategies are first required followed by inference-making processes (Nasajii, 2007) and metacognitive monitoring (Sheorey & Mokhtari, 2001).

Research Question 1.2. How do the results from different assessments correspond to each other?

Before carrying out inferential statistical analyses with the strategy measures, it is important to know the score distributions on these measures in this sample. Table 4.2 shows the summary of the descriptive statistics for the four strategy measures, including the scoring procedures, means and standard deviations.

Table 4.2. *Summary of the Descriptive Statistics of the Four Strategy Use Scores*

	Scoring Procedure	Mean	Standard Deviation
The *CMSQ*	Average of the frequency responses across the strategy 27 items	2.64	.52
Quantity of Total Strategy Use	Sum of frequency counts across each strategy	28.86	7.45
Quality of Total Strategy Use	Sum of quality points across each strategies	41.22	14.01
Sophistication of Strategy Use	A ratio between *Quality of Total Strategy Use* and *Quantity of Total Strategy Use*	1.40	.21

Next, I checked the convergence between the think-alouds and the *CMSQ* using Pearson correlations with the four strategy measures: (1) The *CMSQ,* (2) *Quantity of Total Strategy Use*, (3) *Quality of Total Strategy Use*, and (4) *Sophistication of Strategy Use*. The result is offered in Table 4.3.

Table 4.3. *Pearson Correlations between the Reading Strategy Use Measures*

	The *CMSQ*	*Quantity of Total Strategy Use*	*Quality of Total Strategy Use*	*Sophistication of Strategy Use*
The *CMSQ*	-			
Quantity of Total Strategy Use	.22	-		
Quality of Total Strategy Use	.33*	.93***	-	
Sophistication of Strategy Use	.43**	.53**	.79**	-

*p<.05 **p<.01 ***p<.001

From Table 4.3, it is found that the *CMSQ* does not correlate significantly with the quantity measure of strategy use, but has significant positive correlations with the quality measure of total strategy use and completeness of strategy use (r= .33, .43

respectively). This finding suggests a low convergence between the self-report retrospective measure and the process measure. The higher the readers score on the *CMSQ*, the better their strategic processes are as measured by the quality of total strategy use and completeness of strategy use in the think-aloud protocols. This result suggests that when the readers are engaged more deeply within the think-aloud reading process and initiated the strategies more sophisticatedly, they could reflect upon these activities after the task through self-reports on the questionnaire.

The finding show that the *CMSQ has,* in general, low correlations with the three strategy measures collected from think-alouds, indicating a discrepancy, rather than a convergence, between the results from the retrospective measure and the concurrent measures. This result supports what Veenman and his associates have questioned regarding the extent to which a retrospective instrument, such as questionnaires, could genuinely assess readers' strategic processing due to possible memory loss or distortions caused by the time lag between the actual performance and the self-reports (Veenman et al., 2003; Veenman, 2005). It should be noted that concurrent measures, such as think-alouds, also have inherent methodological limitations. Relevant discussions on the methodological issues from the results will be discussed in Chapter Five.

Pearson correlation analyses on reading strategy use and the readers' language proficiency were also conducted to examine the convergence between the strategy measures and the readers' language proficiency. The result is presented in Table 4.4.

Table 4.4. *Pearson Correlations between Reading Strategy Use and English Language Proficiency*

	The *CMSQ*	*Quantity of Total Strategy Use*	*Quality of Total Strategy Use*	*Sophistication of Strategy Use*
The *TOEIC reading comprehension test*	.28	.24	.46**	.69***
The English academic achievement score	.28	.54**	.69***	.76***

*p<.05 **p<.01 ***p<.001*

Table 4.4 shows that the correlations between the *CMSQ* and two of the language proficiency measures, the *TOEIC reading comprehension test* and the students' English academic achievement scores, are not significant. On the other hand, the three measures from the think-aloud protocols all have moderate to high significant positive correlations with the language proficiency measures. Pearson correlation is .46 between *Quality of Total Strategy Use* and the *TOEIC reading comprehension test* and .69 with the English academic achievement scores. *Sophistication of Strategy Use* even has higher correlations with language proficiency. The Pearson correlation is .69 with the *TOEIC reading comprehension test* and .76 with the English academic achievement scores, indicating that the higher the students' English proficiencies ~~are~~, the better they are able to execute the strategies at a deeper level. This result demonstrates a strong link between language proficiency and strategic processing as recognized in previous literature (e.g., Mokhtari & Reichard, 2004; Oxford et al., 2004; Phakiti, 2008).

To summarize, this part of analysis identifies seven strategy factors from the self-report strategy questionnaire, the *CMSQ*. They are: (1) text comprehension

strategies, (2) elaboration strategies, (3) coherence monitoring strategies, (4) planning strategies, (5) time monitoring strategy, (6) predicting strategy and (7) goal-setting strategy. This strategy structure coarsely corresponds to the dimensions of textbase comprehension, situation model construction and metacognitive monitoring as classified from the think-aloud protocols.

Comparing the correlations among the self-report strategy questionnaire and the three measures derived from the think-aloud protocols, (1) *Quantity of Total Strategy Use*, (2) *Quality of Total Strategy Use* and (3) *Sophistication of Strategy Use*, it is shown that the *CMSQ* has low to no correlations with the three measures from think-alouds, indicating a low correspondence between the self-report retrospect measure and the concurrent measure.

On the other hand, the new measure created by this study to score the think-aloud protocols, *Sophistication of Strategy Use*, has moderate to high correlations with the other three strategy assessments. Moreover, *Sophistication of Strategy Use* also correlates higher with the readers' language proficiency than the other strategy measures, which indicates its substantial external validity. A more detailed discussion on assessing reading strategy use based on these results will be presented in Chapter Five.

Research Question 2 on L2 Reading Interest

The second part of the analyses focuses on Research Question 2. Exploratory factor analyses were carried out to probe into the factor structures of the two interest questionnaires: (1) the *Situational Interest Questionnaire (SIQ)* and (2) the *Interest Experience Scale (IES)*. Then, correlation analyses were applied to examine how situational interest relate to readers' perceived interest.

Research Question 2.1. What are the sources of situational interest in L2 reading for eighth graders?

The *SIQ* assesses readers' situational interest in the English text about chocolate. The internal consistency index, Cronbach's alpha of the whole scale is .75. Using principle component analysis with an orthogonal rotation method, the exploratory factor analysis extracts two factors with eigenvalue greater than one, accounting for a total of 58.17% variance. The factor structure matrix of the *SIQ* with the Cronbach's alpha of each subscale is shown in Table 4.5.

Table 4.5. *Factor Structure of the Situational Interest Questionnaire (SIQ)*

Items	Factor1 Engagingness (Mean/SD= 2.36/.73)	Factor 2 Familiarity and Comprehensibility (Mean/SD = 2.01/ .59)
7. The text contains some unforgettable information.	**.81**	.06
6. The text is thought-provoking.	**.77**	-.02
9. The text makes me happy.	**.72**	.21
5. The text has vivid and exciting details.	**.66**	-.01
8. The text is easy to picture in my mind.	**.62**	.64
3. The text covers a topic I have read about or heard about	-.33	**.700**
before.	.00	**.68**
4. The text contains information that I am familiar with.	.39	**.65**
1. The text is easy to understand.	.53	**.54**
2. The text's main ideas are presented clearly		
Accounted variance	40.15%	18.01%
Cronbach's alpha	.82	.53

Total variance: 59.17%

Mean/ SD for total scale: 2.18/ .56

The first factor involves seven items with factor loadings ranging from .81 to .53. This factor cluster accounts for 40.15% of variance and comprises items related to how appealing this text is to the readers. The items, such as "The text has unforgettable information" and "The text has vivid and exciting ideas", describe the interestingness of the ideas in the text. In addition, positive affective responses, as assessed through item 9 "This text makes me happy", are also integrated into this factor. Hence, this factor is named as "engagingness".

The second factor, named as "familiarity and comprehensibility", contains four items with factor loadings between .70 and .65, to account for 18.01% of total variance. This factor is characterized as to whether the text has familiar information and how easily the text is to understand. According to previous studies, these two elements are also the sources of difficulty in a L2 reading task (Brantmeier, 2006; Robinson, 2001). If a L2 text has a more familiar topic and easier vocabulary or sentence structures, it would be easier for L2 readers to comprehend. Therefore, this factor implies a close relationship between text difficulty and situational interest. When the task is judged to be less familiar and less comprehensible by readers, the situational interest during reading becomes lower.

I also conducted an exploratory factor analysis on the *IES* to inspect its factor structure. The principal component analysis is performed with an orthogonal rotation method. Three factors with eigen value greater than 1 are extracted to account for 76.16% of total variance. Cronbach's alpha of the whole scale is .784. The factor structure matrix is shown in Table 4.6.

Table 4.6. *Factor Structure of the Interest Experience Scale (IES)*

Items	Factor 1 Feelings of interest (Mean/SD= 2.49/ .84)	Factor 2 Feelings of control (Mean/SD= 2.50/ .63)	Factor 3 Feelings of concentration (Mean/SD= 2.32/ .83)
2. I felt that this text was very interesting.	**.85**	.26	.10
1. I felt curious about what the text said during reading.	**.77**	-.17	.23
6. Reading this text was fun.	**.64**	.54	.35
4. I encountered some difficulties during the reading process and did not know how to solve them.	.07	**.85**	-.21
3 I didn't think this reading task is hard.	.24	**.69**	.30
7. I felt lost and didn't know what to do to help me comprehend this text.	-.37	**.63**	.48
5. I was very concentrated when I read this text.	.20	-.06	**.90**
8. I was totally absorbed during reading.	.43	.30	**.71**
Accounted variance	42.52%	19.79%	13.85%
Cronbach' alpha	.76	.64	.77
Total variance: 76.16%			
Mean/ SD for total scale: 2.44/ .59			

Factor One, feelings of interest, consists of three items, all of which relate to the readers' interest level during reading, such as feeling interested or curious. The factor loadings of each item range from .85 to .64 and the accounted variance is 42.52%. The Cronbach's alpha of this subscale is .76.

Factor Two is named as "feelings of control" because the item cluster of this factor is related to how certain the readers feel in accomplishing this task successfully.

This factor has items loaded from .848 to .626 to account for 19.79% of variance. The Cronbach's alpha of this subscale is .64. Moreover, the first factor and the second factor correspond to the original factor structure of this questionnaire in the previous study with a silent reading task (Lin, 2009).

The third factor, "feelings of concentration", is an additional extraction. This factor is not found in the previous study (Lin, 2009), suggesting that the readers' experience of concentration has unique contribution to the whole interest experience in the context of think-aloud. Two items are loaded high on this factor with loadings between .90 and .71 and the accounted variance is 13.85%. These items describe the degree of attentiveness the readers experienced during reading. All in all, the three-factor structure represents three aspects of interest experiences of the readers when they are reading and thinking-aloud the English text.

Table 4.7. *Correlations between Reading Interest and Language Proficiency*

	Engagingness	Familiarity and comprehensibility	*SIQ* total	Feelings of Interest	Feelings of control	Feelings of concentration	*IES* total
The *TOEIC reading comprehension test*	.39*	.39*	.46**	.26	.600***	.33	.46**
The English academic achievement scores	.27	.37*	.37*	.40*	.54**	.35*	.37*

*p<.05 **p<.01 ***p<.001*

Table 4.7 presents the correlations between the reading interest measures and the readers' language proficiency in order to check the external validity of these two

reading interest instruments. In general, both of the *SIQ* and the *IES* are found to have low to moderate positive correlations with the readers' English language proficiency as measured by the *TOEIC reading comprehension test* and the English academic achievement scores.

For the *SIQ*, the Pearson correlation coefficient is .39 between the *SIQ* and the English reading comprehension test and .37 between the *SIQ* and the English academic achievement scores. As for the *IES*, the Pearson correlations between the *IES* and the language proficiency measures are .46 and .37. These moderate correlations suggest that L2 reading interest is only partially related to English language proficiency, and other factors, such as text characteristics, might also play an important role in inducing L2 readers' interest.

At a closer look, the subscale of the *IES*, feelings of control, has the strongest connection with language proficiency. The Pearson correlations between feelings of control and the English reading comprehension test is .60 and .536 with the English academic achievement scores. This finding implies that language proficiency is mostly connected to how confident readers feel about themselves in completing the task, and less connected with readers' interest judgment about the task per se.

Research Question 2.2. How does situational interest relate to perceived interest?

To answer this question, Pearson correlation analysis was performed to analyze the relationships among the latent variables of the *SIQ* and the *IES*. Then, multiple regressions were applied with the *IES* as the dependent variable and the factors of the *SIQ* as the independent variables. These results are reported in the following.

Correlations between situational interest and perceived interest. To better understand the internal structures and the mutual relationships between the two

interest-related constructs, situational interest and interest experiences, Person

correlation analysis was conducted with the two factors of the *SIQ* and the three

factors of the *IES*, which include (a) engagingness, (b) familiarity and

comprehensibility, (c) the *SIQ* total scores (d) feelings of interest, (e) feelings of

control, (f) feelings of concentration and (g) the *IES* total scores. Table 4.8 presents

the inter-correlations among the subscales of the *SIQ* and the *IES*.

Table 4.8. *Correlations between the SIQ and the IES*

	Engagingness	Familiarity and comprehensibility	*SIQ* total	Feelings of interest	Feelings of control	Feelings of concentration	*IES* total
Engagingness	-						
Familiarity/ comprehensibility	.30	-					
SIQ total	.93***	.62***	-				
Feelings of interest	.73***	.30***	.71***	-			
Feeling of control	.19	.51**	.35*	.27	-		
Feelings of concentration	.57***	.22	.55**	.55**	.30	-	
IES total	.67***	.45**	.72***	.84***	.66***	.78***	-

*p<.05 **p<.01 ***p<.001*

It is shown that the two subscales of the *SIQ* do not have a significant

correlation with each other (r= .30, *p>.05*). This result indicates that the engagingness

of the content and text familiarity could be distinct sources for situational interest.

The three subscales of the *IES* have either a moderate correlation or no

correlations with each other. The highest correlations among these subscales is

between feelings of interest and feelings of concentration (r= .55, *p<.001*), showing

that the more interest feelings are experienced, the higher degree of concentration is reported during reading. On the other hand, feelings of control does not correlate with the other two subscales, interest feelings and concentration (r= .27, .30 respectively, *p>.05*).

As for the correlations between the *SIQ* and the *IES*, Table 4.8 shows that there are, in general, moderate to high positive correlations between the *SIQ* and the three subscales of the *IES*. If the readers perceive more situational interest in the text, they would experience more interest (r= .71, *p<.001*), have a stronger feeling of control (r=.35, *p< .01*) and become more focused (r= .55, *p< .01*) on the text. The correlation between the total scores of the *SIQ* and the total scores of the *IES* is high (r= .72, *p< .001*), which indicates a high degree of convergence between these two interest-related variables.

Multiple regressions to predict perceived interest with situational interest. The next step to explore the relationship between situational interest and perceived interest is to determine how the sources of situational interest influence the readers' interest experience during reading. Simultaneous multiple regressions were applied with the *IES* total score as the dependent variable and the latent variables of the situational interest: engagingness and familiarity/comprehensibility, as the two predicting variables. Table 4.9 reports the results of this analysis, including standard errors of unstandardized regression coefficients (*SE B*), standardized regression coefficients (β) and total variance explained by the predictors.

Table 4.9. *Multiple Regression Predicting Interest Experiences Using the Factors of Situational Interest*

| | Dependent variable | | | |
| | Interest experiences | | | |
Predictor	*SE B*	β	R	Adjusted R Square
1. Engagingness	.14	.59***	.72	.49
2. Familiarity and comprehensibility	.31	.22*		

*p<.05 **p<.01 ***p<.001*

The multiple regression analysis yields an adjusted R square of .49, indicating that 48.9% of total variance is explained by the two predictors. Examined closely, engagingness has more contribution to interest experiences than familiarity/ comprehensibility (β= .59 and .22, respectively). This result suggests that the content of the L2 text might be more influential than the linguistic difficulty of the L2 text to affect readers' interest experiences.

In summary, two main findings are reported in this section regarding how situational interest relates to perceived interest. Firstly, two sources for situational interest are identified from the questionnaire, *SIQ*. They are engagingness of the text content and familiarity/comprehensibility of the L2 text. Secondly, both of the two sources of situational interest have significant contributions to readers' perceived interest during reading. In specific, the interestingness of the L2 content has stronger influences on perceived interest than the difficulty level of the L2 text. This result suggests that L2 readers gain more enjoyment from reading an interesting L2 text than reading an easy but uninteresting L2 text. In other words, L2 readers seem to approach an L2 text as a meaning construction activity as in L1 reading, rather than a mere problem-solving, language decoding task.

Research Question 3 on Relationships among Reading Strategy Use, Reading Interest and Reading Comprehension

The third part of the analyses addresses Research Question 3. The reading strategy use measures, the reading interest measures, and the reading comprehension measures were entered into correlation analyses first to uncover the interrelationships among these variables. Then, multiple regression analyses were utilized to understand the contributions of reading strategy use and reading interest to reading comprehension. In particular, the technique of hierarchical multiple regressions was chosen to examine the unique contribution of each variable after the other variables are controlled for on reading comprehension. The following sections report the results of these analyses.

Research Question 3. How do L2 reading strategy use, sources of interest and perceived interest relate to L2 reading comprehension?

This section presents two types of statistical procedures to address this broad question. The first one is correlation analyses on the interrelationships between the three variables. The second one is hierarchical regressions to compare the unique contributions of L2 reading strategy use and L2 reading interest to reading comprehension.

Correlations between L2 reading strategy use, reading interest and reading comprehension. The study analyzes the relationship between L2 reading strategy use and L2 reading interest through Pearson correlation analysis. The correlation coefficients between the four reading strategy use measures and the two reading interest measures are presented in Table 4.10.

Table 4.10. *Correlations between L2 Reading Strategy Use and L2 Reading Interest*

	Engagingness	Familiarity & comprehensibility	*SIQ* total
The CMSQ	.62***	.36*	.65***
Quantity of Total Strategy Use	.21	.22	.26
Quality of Total Strategy Use	.37*	.36*	.43**
Sophistication of Strategy Use	.51**	.51**	.61***

	Feelings of Interest	Feelings of control	Feelings of concentration	*IES* total
The CMSQ	.53***	.28	.59***	.61***
Quantity of Total Strategy Use	.16	.35*	.21	.31
Quality of Total Strategy Use	.37*	.51**	.33*	.53**
Sophistication of Strategy Use	.60***	.61***	.45**	.73***

*p<.05 **p<.01 ***p<.001*

For the strategy questionnaire measure, the *CMSQ* is highly correlated with the *SIQ* (r = .65, *p< .001*) and the *IES* (r= .611, *p<. 001*) at the significance level. These correlations are higher than those between the strategy scores from the think-aloud protocols and the interest questionnaires. This result might be explained from the viewpoint of instrumentation effects (Brewer, 2000). The three measures (The *CMSQ*, the *SIQ* and the *IES*) are all self-report questionnaires on Likert-type scales. Hence, the participants' responses on this type of instruments might yield similar patterns or variations, which lead into higher correlations within similar instruments than the correlations collected from different methods.

As for the correlations between the three strategy use measures from the

think-aloud protocols and the two reading interest questionnaires, Table 4.10 shows that *Quantity of Total Strategy Use* does not have significant correlations with the *SIQ* and the *IES* (r= .26, .31, respectively, *p>.05*). However, *Quality of Total Strategy Use* demonstrates low or moderate positive correlations with the *SIQ* (r= .43, *p<. 01*) and the *IES* (r=.53, *p< .01*).

Most important of all, the fourth strategy measure, *Sophistication of Strategy Use,* is shown to have the highest positive correlations with reading interest. The Pearson correlation between *Sophistication of Strategy Use* and situational interest is .61 (*p< .001*). *Sophistication of Strategy Use* is also highly correlated with interest experiences(r= .73, *p < .001*). All of the subscales of the *SIQ* and the *IES* are also moderately correlated with *Sophistication of Strategy Use*. As readers process the reading strategies at a deeper level, they tend to judge the text to be more interesting and report to experience more concentration and feelings of control during this process. This relationship could be recursive instead of unidirectional. When the readers feel more interested in this text, they are more willing to use strategies more sophisticatedly. On the other hand, it is also possible that if readers have better command of using strategies, they are more able to carry these strategies out successfully to achieve the reading goal. This fulfillment from the readers' strategic competence, in turn, generates the perception of interestingness about the text and feelings of self-efficacy during reading.

One of the main purposes of this study is to understand the relationships among reading strategy use, reading interest and reading comprehension of the text. To this end, Pearson correlation analysis was conducted to inspect the correlations among prior knowledge measures, the reading comprehension measures, the four reading

strategy use measures and the two reading interest questionnaires as shown in Table 4.11.

Firstly, it is found that the two prior knowledge measures, breadth of prior knowledge and relevance of prior knowledge, do not correlate significantly with most of the strategy measures and the interest questionnaires. The only significant correlation related to prior knowledge appeared to be between the breadth of prior knowledge and the quantity of total strategy use (r= .34, *p<.05*), which means if the readers report more knowledge about the text topic, chocolate, they also produce more strategies in the think-aloud protocols. However, the correlation coefficient does not reach the power level of .80, so the inference made based on this result would be less robust.

Table 4.11. *Correlations between Prior knowledge, Reading Strategy Use, Reading Interest and Reading Comprehension*

	The CMSQ	Quantity of Total Strategy Use	Quality of Total Strategy Use	Sophistication of Strategy Use	The SIQ	The IES
Breadth of prior knowledge	.01	.34*	.32	.20	.10	.12
Relevance of prior knowledge	-.06	.13	.17	.19	.12	.17
The multiple-choice reading comprehension test	.05	.23	.33	.36*	.01	.22
Text retellings	.45**	.36*	.57**	.76***	.59***	.63***

*p<.05 **p<.01 ***p<.001*

Although the correlations between the prior knowledge measures, strategy use measures and reading interest scales are not statistically significant, there is abundant evidence in the qualitative analysis showing that the L2 readers have actively utilized

their prior knowledge about chocolate to elaborate comprehension, draw inferences, and make interestingness judgments. Therefore, the non-significant effects from prior knowledge in the quantitative analysis could be explained from the limitations of the methodology.

The method used to assess prior knowledge in this study is a recall task where the readers were told to freely report what they could think of immediately about chocolate. This method is "the least directive and least structured " (p. 210, Valencia et al., 1991), so it might render diverse output that is the least related to a designated topic of the reading material. In addition, for younger learners, retrieving information with very limited prompts or cues might also be too ambiguous for them to provide very specific knowledge immediately. Thus, it is suggested that using a recognition task, such as a prior knowledge test, might be more appropriate to capture young learners' prior knowledge for a specific topic within a short time.

Second, Table 4.11 shows that the multiple-choice reading comprehension test does not have significant correlations with the interest measures and the strategy measures except for *Sophistication of Strategy Use*. Pearson correlation between the multiple-choice reading comprehension test and *Sophistication of Strategy Use* is .360 (*p<.05*). It should be reminded that in the methodology chapter, the reliability of this multiple-choice reading comprehension test is low (Cronbach's alpha = .33) as well. Hence, it is suggested that this assessment lacks substantial reliability and needs revision before any interpretation based on it should be made.

As for the text retellings, it has significant moderate or high positive correlations with all of the strategy use measures, including the *CMSQ,* quantity, quality and sophistication of strategy use (r= .36~ .76). Notably, the highest correlation with the

text telling scores is *Sophistication of Strategy Use* (r= .76, *p<.001*). This result demonstrates that when the readers are highly engaged in processing the strategies, they could recall the text better.

In addition, the text retellings also positively correlate with the *SIQ* (r= .59, *p<.001*) and the *IES* (r= .63, *p<.001*) at the significance level. This finding indicates that reading interest is also highly associated with reading comprehension as strategy use does. When the readers experience more interest feelings and value the interestingness of the text, they generate better text recalls for the text.

Multiple regressions to predict reading comprehension with L2 reading strategy use and L2 reading interest. To conduct multiple regressions, it is important to determine what the best predictors are in relation to the dependent variable (Pedhazur, 1997). In this study, the dependent variable is reading comprehension. Two measures for reading comprehension were employed; one was a multiple-choice reading comprehension test and the other one was text retellings. According to the reliability and validity analysis, the multiple-choice reading comprehension test does not have sufficient reliability and its convergent validity with other measures is also problematic. By comparison, the text retelling scores are shown to have reliable and consistent high correlations with other relevant constructs, such as language proficiency. Therefore, the text retellings are chosen as the dependent variable for reading comprehension.

As for the predictors of reading strategy use, the study has four measures of reading strategy use. These measures are reported to have moderate to high correlations with each other. If highly-correlated independent variables are entered simultaneously into regression analyses, the effects of multicollinearity might occur

to reduce the predictive power of the single independent variable (Hair et al., 2005). Hence, only the measure, *Sophistication of Strategy Use*, was selected to represent L2 reading strategy use because it had been proven to have stronger construct validity and external validity than the other three measures in the previous analyses.

Regarding the second predictor variable, reading interest, the study assesses two different interest constructs: situational interest and interest experiences. Situational interest refers to readers' judgments about the sources of situational interest in the text and interest experiences depict readers' perceived emotional responses during reading. Due to the distinct nature of these two constructs, the study conducted two sets of hierarchical regressions to better uncover the influences of each interest construct on reading comprehension; one involved reading strategy use and situational interest as the predictors and the other one included reading strategy use and interest experiences as the predictors.

To examine the independent contributions of each predictor to reading comprehension, a series of hierarchical regressions was performed. Text retellings were the measure of outcomes of every analysis. Each analysis included the students' English academic achievement scores as the first step in the equation to control for the effect of language proficiency. To inspect the independent role of strategy use on reading comprehension, situational interest was entered as the second step and *Sophistication of Strategy Use* as the third step. Conversely, to determine the independent influences of situation interest on reading comprehension, *Sophistication of Strategy Use* was entered as the second step and situational interest as the third step. Table 4.12 presents the results of these hierarchical regressions, including standard error of unstandardized regression coefficients (*SE B)*, standardized

regression coefficients (β) and R square change from the step at which the variable is entered in the model.

Table 4.12. *Hierarchical Regression Analyses Predicting Reading Comprehension Using Language Proficiency, Reading Strategy Use and Situational Interest*

| Step and predictor | Dependent variable | | |
| | Text retellings | | |
	SE B	β	Adjusted R square change
1. The English academic achievement scores	.05	.54**	.27
2.Situational interest	.15	.45**	.17
3. *Sophistication of Strategy Use*	5.46	.67**	.13
2. *Sophistication of Strategy Use*	4.55	.83***	.28
3.Situational interest	.16	.19	.01
Total adjusted R square .56			

*p<.05 **p<.01 ***p<.001

It is found that reading strategy use still has a significant contribution to L2 reading comprehension after language proficiency and situational interest are accounted for (β = .67, *p<.01*). Adding this predictor increases the total explained variance by 12.5%.

As for the impact of situational interest, the analyses show that when situational interest is entered after reading strategy use, it does not have a   significant contribution to reading comprehension (β =.192, *p> .05*). However, it can significantly increase the variance by 16. 60 % when it is entered *before* the variable, reading strategy use. This result implies an overlapping variance shared by situational interest and reading strategy use. When situational interest is a sole predictor, it has

significant predictive power for reading comprehension. Nevertheless, when the variance of reading strategy use is controlled ~~for~~, the rest of the variance explained by situational interest alone is not substantial enough to reach the significance level.

The second set of hierarchical regression included the text retellings as the dependent variable and the English academic achievement scores, *Sophistication of Strategy Use* and interest experiences as the predictors. The order was the same as the first set of hierarchical regressions; the readers' English academic achievement scores were entered as the first step and reading strategy use and interest experiences as the second and third step. The statistical results are offered in Table 4.13.

Table 4.13. *Hierarchical Regression Analyses Predicting Reading Comprehension Using Language Proficiency, Reading Strategy Use and Interest Experiences*

	Dependent variable		
	Text retellings		
Step and predictor	*SE B*	β	Adjusted R square change
1. The English academic achievement scores	.05	.54**	.27
2. Interest experiences	.18	.48**	.15
3. *Sophistication of Strategy Use*	5.52	.70**	.13
2. *Sophistication of Strategy Use*	4.55	.83***	.28
3. Interest experiences	.20	.17	.00
Total adjusted R square .55			

*p<.05 **p<.01 ***p<.001

Table 4.13 shows that reading strategy use is still a significant predictor to increase the total variance of reading comprehension by 13.4 % after language

proficiency and interest experiences are controlled. The result is the same as the first set of hierarchical regressions with situational interest as the other predictor.

In light of interest experiences, a similar pattern as the first set of hierarchical regressions is revealed. Interest experiences do not produce significant contribution when language proficiency and reading strategy use are accounted for ($\beta =.17$, $p > .05$). Likewise, interest experiences remain as a significant predictor for reading comprehension to increase the variance by 14.8% *before* reading strategy use enters into the model.

To conclude, the results from the hierarchical regressions indicate that reading strategy use has a stronger contribution to L2 reading comprehension than reading interest. Moreover, the findings suggest that reading strategy use might play a mediating role between reading interest and reading comprehension, because the effects of reading interest on reading comprehension are shown to disappear after the influences of reading strategy use come into play. In other words, the effects of interest on reading comprehension should be manifested through the processes of reading strategy use. As the readers feel more interested in reading the text and experience more positive emotions, they are motivated to execute the reading strategies more thoroughly with more effort, which in turn improves comprehension. The emotional process and the cognitive process are not only closely related to each other, but also intertwined to a degree that is difficult to disentangle.

Summary

This part reports all quantitative results to address the three research questions. Research Question 1 aims to identify the types of strategies employed by the participants and examines whether the strategy use measured from the self-report

questionnaire, *CMSQ* , corresponds to the concurrent measure, think-aloud protocols. For the *CMSQ*, the exploratory factor analysis identifies eight factors, including seven strategy categories and readers′ emotional responses. These factors are summarized as follows:

(1) Text comprehension strategies: 13 reading strategy used to analyze the linguistic input, construct the textbase and metacognitively regulate these processes

(2) Elaboration strategies: 3 reading strategies used to paraphrase and elaborate the meanings using more familiar words

(3) Coherence monitoring strategies: 3 reading strategies used to monitor whether the current understanding is coherent and logical

(4) Planning strategies: 2 reading strategies used to make plans and decide what to do for the reading task

(5) Time monitoring strategies: 2 reading strategies used to monitor the remaining time and adjust the reading activities accordingly

(6) Predicting strategy: 1 reading strategy used to predict the following content based on available cues in the text

(7) Goal-setting strategy: 1 reading strategy used to set up a goal for the reading task

(8) Emotional response: 1 item related to readers′ reflections on the emotional changes during reading

For the think-aloud protocols, three scoring procedures are used to quantify the readers′ verbal reports and three strategy scores are derived for each reader; they are

(1) *Quantity of Total Strategy Use*, (2) *Quality of Total Strategy Use* and (3) *Sophistication of Strategy Use*. To compare the correspondence between the strategy questionnaire and the think-aloud protocols, it is found that the strategy questionnaire, *CMSQ* has only low to no correlations with the three measures from think-alouds. This result suggests a low correspondence between the self-report measure and the process measure, such as think-aloud protocols, for reading strategy use.

In addition, one of the strategy measures obtained from the think-aloud protocols, *Sophistication of Strategy Use*, is found to have the highest correlations with the other strategy measures, the readers' language proficiency measures, and the L2 reading comprehension measures. The results imply that this strategy measure could be a more valid and meaningful approach to assess and score strategy use than the other types of measures.

To address Research Question 2 on the sources of the readers' situational interest and perceived interest, exploratory factor analyses are carried out with the two interest scales, *SIQ* and *IES,* respectively. Two factors are revealed from the *SIQ* and three factors are identified from the *IES*. The names of the factors, the descriptions and the number of items are listed in Table 4.14.

Table 4.14. *Summary of the Underlying Factor Structures of the SIQ and the IES*

	Factor	Name of the factors	Description
The *SIQ*			
	Factor One	Engagingness	5 items describing the interestingness of the ideas or the content of the text
	Factor Two	Familiarity and Comprehensibility	4 items describing the familiarity and the ease of comprehension of the text

The *IES*			
	Factor One	Feelings of interest	3 items describing readers' feelings of interest and curiosity as reading this text
	Factor Two	Feelings of control	3 items describing readers' feelings of control and self-efficacy in finishing this task
	Factor Three	Feelings of concentration	2 items describing readers' feelings of concentration during the task

Pearson correlation analyses with the subscales show that the two interest scales as well as the subscales, in general, have moderate to high positive correlations among each other. The results indicate positive relationship between situational interest and readers' interest experiences.

Research Question 3 focuses on analyzing the unique contributions of reading strategy use and reading interest to readers' comprehension performance. The results of hierarchal regressions with the readers' text recalls as the dependent variable show that reading strategy use has significant influences on reading comprehension. On the other hand, the two constructs of reading interest, situational interest, and perceived interest, also has important effects on reading comprehension. However, the effects are relatively smaller than reading strategy use and even disappear when the contribution of reading strategy use is accounted for in the regression equations. This result suggests that reading strategy use might mediate the influences of reading interest on reading comprehension. It also implies an intertwined relationship between the cognitive processes and emotional processes during L2 reading.

Part B: Qualitative Results

In Part B, I report the qualitative results to address the three research questions. Research Question 1 aims to examine the specific reading strategies employed by the

L2 eighth- graders. I will explain the 12 reading strategies identified from the think-aloud protocols with sample utterances from the verbal reports. I also contrast the strategy use frequencies between the proficient L2 readers and the less proficient L2 readers to elucidate individuals' differences in strategy use.

Research Question 2 probes into the sources of situational interest in reading L2 texts. The study uses retrospective interviews after the reading task to collect readers' reflections on why the text is interesting or uninteresting for them to read. The data is coded for eight types of situational interests. The coding matrix is presented and the patterns of reader-text interest in L2 reading are also observed and interpreted.

Research Question 3 focuses on the interactions among L2 reading strategy use, reading interest, and L2 reading comprehension. The study selects three learners to represent different L2 readers who demonstrate distinct patterns in terms of language proficiency, reading strategy use, reading interest and reading outcomes. The data, including the students' academic achievement, think-aloud protocols, interviews, text recalls and questionnaires, are analyzed in detail. Based on the analyses of the three cases, the study elucidates the complex dynamics among contextual effects, L2 readers' language learning motivation, reading interest in the current task, strategy use and reading comprehension.

Research Question 1:.What are the L2 Reading Strategies Employed by Eighth-graders Identified from the Think-aloud Protocols?

In Chapter Three, the procedures of analyzing the think-aloud verbal reports to identify types of strategies were described. As defined in this study, strategy use is readers' purposeful and resourceful effort to reach certain goals during reading, such as solving comprehension problems or establishing more coherent understanding

about the text. The qualitative analysis yields 12 reading strategies. The labels of each strategy and their definitions are:

(1) Word-by-word translation: Readers try to translate the English words in a sentence into Chinese in a word-for-word manner.

(2) Paraphrasing: Readers paraphrase the sentences in Chinese using more familiar or easier words in order to hold the meanings in work memory more easily.

(3) Determining an unknown word's meaning by using contextual cues or linguistic cues: Readers use the contextual cues, including titles, pictures and other known words in the sentence, or linguistic cues to infer the meanings of unknown words.

(4) Determining the meaning of a sentence by using contextual cues: Readers encounter unknown words in a sentence and use contextual cues, such as pictures or other known vocabulary in or across the sentences, to infer overall meanings of the sentence.

(5) Elaborating on the text: Readers draw additional information related to text content from their prior knowledge as a way to bridge the text content with their schema of similar topics.

(6) Summarizing: Readers recognize important messages in a paragraph and provide a summary to synthesize them.

(7) Evaluating and responding to text content: Readers compare the text with their prior knowledge, personal experiences or attitude and make personal judgments about the information, including acceptance or disagreement.

(8) Generating explicit inferences based on text content: Readers learn from text

content and generate explicit causal inferences about the ideas in the text.

(9) Clarifying unclear information in text: Readers try to clarify the confusing part of the text by self-questioning or creating a mental image about the content.

(10) Making forward inferences about the content or text structures: Readers predict what the upcoming information in the text would be based on keywords or textual structures.

(11) Monitoring the comprehension coherence or difficulty level: Readers detect the difficulty of the task and monitor whether they have incoherent understanding or lack of understanding about the text.

(12) Planning on executing solutions to solve problems: Readers decide what to do next when encountering difficulties, such as skipping the sentences or going back to reread again.

In the following sections, I will explain each reading strategy in more detail by three theoretical aspects: textbase comprehension, situation model construction, and metacognitive processing. How the readers of different language proficiency levels enacted these reading strategies to reach comprehension will also be discussed using examples from the excerpts in their verbal reports.

Textbase comprehension strategy use

The dimension of textbase comprehension strategies includes the strategies of "word-by-word translation", "paraphrasing", "determining an unknown word's meaning by using contextual cues", and "determining the meaning of a sentence by using contextual cues". These strategies are introduced as follows.

Word-by-word translation and paraphrasing. To construct the textbase, it is found that translating, such as word-by-word translation or paraphrasing to convert

the English sentences into Chinese sentences, was the most basic and major process that these readers were engaged in with during the think-alouds. Kern (1994) defines translation as a "mental reprocessing of L2 words, phrases, or sentences in L1 forms while reading L2 texts" (p. 442). Kern argues that mental translation during L2 reading is a fundamental process that help generates and reserves the meaning of the text in working memory for further cognitive processing. L2 studies on using translations as a learning strategy also indicate that during translating, learners could utilize their L1 as a leverage point to overcome some deficits of L2 knowledge and improve their performances in writing, reading and vocabulary acquisition (Liao, 2006; Hummel, 1995; O'Malley & Chamot, 1990).

In the present study, two types of translations are distinguished. The first one is word-by-word translation, where the readers attempt to translate every word in the sentences into Chinese directly. It should be noted that some of the syntactical structures in English are different from those in Chinese. For example, in English, the locative phrases and temporal adjuncts are often placed at the end of a sentence, while in Chinese, the legitimate positions of these adverbial adjuncts are usually in the middle of a sentence. Therefore, translating an English sentence word by word into Chinese sometimes does not lead into a grammatically-correct and meaningful Chinese sentence, which in turn might not facilitate comprehension.

For instance, Reader 1212, a low-English achieving student, is shown to use this strategy in the entire think-aloud transcript. He translated all English words into Chinese directly for the whole text with a focus on the nouns. His text recall below shows that most of his recall contains only nouns in the text, revealing an inadequate construction of the textbase at the propositional level.

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Reader 1212:

還記得卡洛里，巧克力，巧克力就從甚麼地方來的，然後巧克力會影響我們的健康，會很胖。

(I remember calories, chocolate… Chocolate is from somewhere.

Chocolate is bad for our health. And being fat.)

The other kind of translation is paraphrasing the original English sentence using the readers' own words to produce a more logical and coherent propositional statement in Chinese. According to Zwaan and Brown (1996), a paraphrase is a translation of a sentence that preserves the meaning and partial structure of the original sentence. McNamara et al. (2007) also explains that paraphrasing enables readers to transform the original text into a representation that is more familiar and more memorable for them. The ability to paraphrase demonstrates a reader's capability to further process the superficial linguistic codes of a sentence to form the legitimate syntactical structure in a meaningful way. In addition, paraphrasing also signals readers' metacognitive awareness of the comprehension process. Through paraphrasing using their own words, readers are trying to manage the reading task, finding connections between the new information in the text and what they have known, and rehearse it to help with learning and retention (McNamara & Magliano, 2009).

The excerpts below are produced by Reader 1104, a high-English achieving student. The sentence contains several thought units that demonstrate how he strategically used the paraphrasing strategy to translate the sentences into more

cohesive propositions in Chinese with additional adjectives or colloquia terms.

Original sentences:

White chocolate is different from dark chocolate because it is made from cocoa butter, not the cocoa. Therefore, it does not have the good antioxidants in dark chocolate. Cocoa butter has very little caffeine, so white chocolate doesn't have as much caffeine as dark chocolate.

Reader 1104:

1. 白巧克力是不同的，來自黑巧克力，因為它是用可可亞的奶油，可是不是可可亞原本的。(White chocolate is different, coming from dark chocolate, because it is made out of the butter of cocoa, not the original cocoa itself).

2. Therefore, 它沒有好的抗氧化物，在巧克力，也就是說，他沒有黑巧克力有的抗氧化物。(Therefore, it does not have the good antioxidant. In other words, in [white] chocolate, it does not have that kind of antioxidant in dark chocolate.)

3. 就是說可可亞奶油有很多微小的咖啡因，所以白巧克力沒有很多咖啡因，和黑巧克力比沒有很多。

(It says that cocoa butter has very tiny caffeine, so white chocolate does not have a lot of caffeine. If compared with the dark chocolate, it does not have a lot [of caffeine].)

The excerpts show that Reader 1104 managed to paraphrase the text using more familiar or descriptive words, such as "original" and "tiny", to self-explain the ideas of the sentences. In addition, he also tried to incorporate the information learned from the previous sentence into the current understanding and kept track of the relationships that spanned across sentences through paraphrasing. In this way, the paraphrases helped him better organize and memorize what was previously comprehended in the work memory. He could then further accommodate the proceeding information as the reading continued. These paraphrases also vividly illustrate the dynamic nature of on-line text processing.

Determining the meaning of a word or a sentence by using contextual cues. As L2 readers translate sentences, they usually find it difficult to completely understand the meaning of a sentence if one or several unknown words are encountered in a sentence. A common solution to resolve such word problems is to rely on the contextual cues available in the text to infer the meanings. According to Bengeleil and Paribakht (2004), contextual clues could come from the linguistic characteristics of the other known words or sentences in the text, such as word morphology, sentence meaning, syntax, pragmatic relations or grammar. In addition, L2 readers also utilize their world knowledge about the topic to facilitate lexical inferencing.

In the present study, the strategies involving the use of possible cues to infer meanings at the lexical level or the sentence level are named as "determining an unknown word's meaning by using contextual cues or linguistic cues" and "determining the meaning of a sentence by using contextual cues". Due to limited vocabulary knowledge, inferring the meaning of new words in a text becomes a necessary practice in L2 reading. This requires strategic utilization of contextual cues,

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such as reading backward for accessing previous cues, reading forward to get more information, or using the grammatical relationship and semantic similarity between words, to successfully solve the word problems (Chern, 1993).

This study found that the low-achieving readers tended to use the contextual cues more frequently than the high-achieving readers in determining the meaning of a sentence. In contrast, the high-achieving readers used the contextual cues more frequently to infer the meanings of the unfamiliar words. Due to limited language knowledge, the low-achieving readers might recognize fewer words in a sentence. This might make them more inclined to guess the meaning of the whole sentence based on the immediate local context, rather than focusing on working out the individual meanings of each unfamiliar word. This type of guessing strategy on the global level could easily lead these low proficiency readers to form incomplete textbase model containing miscellaneous disconnected propositions. The five excerpts below from Reader 1112, a low-achieving reader, demonstrate such results.

Reader 1112:

1.這是說我們喜歡吃這個，這句話是說，甜美的，就是好吃的巧克力。 (It says that we all like to eat this, this sweet and delicious chocolate.)

2. 這一句我看不懂，不過應該是說跟牛奶有關係。 巧克力跟牛奶一起吃吧。(I don't understand this sentence. But it should be related to milk. Maybe it's saying eating chocolate with milk.)

3. 他說我們知道巧克力會引起胖…應該是胖之類的。(It says we know that chocolate will cause….something like being fat.)

4. 恩.. 這個抗氧化物對不對，所以巧克力能夠降低對我們，人體的傷

害吧。(This antioxidant, right?…so chocolate can lower…some damages to our body, maybe.)

5. 它說吃這個有三十的熱量啊，然後應該是每天的需要吧。(It says eating this will produce 30 calories. This might be about what we need every day).

These excerpts show that he tried to make general inferences about the meanings of the sentences based on the meanings of other words in the immediate context. Some of them might be correct (e.g., Verbalization 4), some are only partially relevant (e.g., Verbalization 5), and some might be entirely different from what is being said in the text (e.g., Verbalization 1 and Verbalization 2). In addition, he also used his background knowledge to help him generate the inferences. For example, Verbalization 3 was produced when he was reading the paragraph on how chocolate can cause heart diseases instead of causing obesity. Therefore, this inference was solely based on his prior knowledge about the relationship between chocolate and calories. Although this idea was indeed mentioned in the later paragraph, this inference here in effect inhibited him from comprehending the textual meaning of this paragraph.

Moreover, the low-achieving readers usually inferred the meanings within a sentence, instead of monitoring the semantic coherence across sentences. Hence, their textbase models revealed from the think-aloud reports were often composed of isolated propositions without cohesive connections. As a result, although many inferences were made to determine the meanings of the sentences, these low-achieving readers still found it hard to recollect the major information in the text

after reading was completed. The text recall of Reader 1112 illustrates that what he could remember better was still the logical and coherent part of the ideas, not the isolated and disconnected inferences he made using the contextual cues.

> Reader 1112:
>
> 巧克力是來自哪裡的。吃這個會對人類的身體怎麼樣就不知道了。還有她說這個東西有多少的熱量，一份這樣子。(Chocolate is from somewhere. Eating it seems to have some effects to human bodies. And it says how much calories this thing have, per portion.)

It was observed that the high-achieving readers spent more time deciphering the meaning of each word in a sentence before they proceeded to understanding the meaning of the whole sentence. This finding supports the importance of word-unit processing in L2 reading, especially for beginning L2 readers (Haynes, 1993; Bengeleil & Paribakht, 2004; de Bot, Paribakht, & Wesche,1997). Young L2 readers with limited language proficiency might often lack the sophisticated knowledge about the syntactic and collocative relationships in a sentence. They also tend to possess inadequate background knowledge about the topic of the text to draw correct inferences for a whole sentence. The focus on solving word-level problems rather than deriving a global inference for a sentence helps readers construct better textbase model and prevents them from making erroneous conjectures.

Furthermore, the study also found that the L2 readers used a variety of linguistic cues to infer the meaning of an unknown word in addition to the semantic information from the context. Similar to the study by Chern (1993), pronunciation

and word analysis were some of the tactics used by the readers as they tried to decode the word meanings. Some readers tried to pronounce the unknown word first and then judge what the word sounds like. For example, the word "*caffeine*" was new to most of the readers, but its Chinese translation is phonetically similar to the English pronunciation. Several readers successfully guessed its meaning because they sounded it out first and quickly connected it to the Chinese translation due to the phonetical similarity as the English pronunciation.

The other type of lexical inference strategy using linguistic cues is analyzing graphemes of the unknown words. Some readers could infer the meaning of the word "*caffeine*" because "it looks just like the word, *coffee*." *(Reader 1223)*. However, this grapheme-based inference is also likely to lead to mistakes. Several readers mistakenly recognized some words as a different word because of the similar shapes. For example, "yogurt" for " sugar", "kid" for "kind", and "weather" for "water". This in turn twisted their understanding of the meaning of the whole sentence.

In conclusion, the L2 readers' verbal reports show that lexical or sentence decoding are the basic and essential activities during L2 comprehension at the textbase construction level. Using contextual cues or linguistic cues to infer the meanings is the strategic solution L2 readers use to solve word problems. This strategic process involves activation of readers' knowledge about the other words from the context and the linguistic information of the unknown word to make inferences about its possible meanings. This top-down process is initiated for the purpose of facilitating the establishment of the linguistic representation of the text (Stanovich, 1978; Haynes, 1993; de Bot, Paribakht, & Wesche,1997).

Situation model construction strategy use

Situation model is a structure composed of the textbase and additional propositions from personal interpretation related to the readers' background knowledge or experiences (Kintsch, 1998). The application of prior knowledge to enrich the textbase is characterized as strategies for situation model construction. Six of such strategies are identified in the verbal reports. These include: elaborating on the text, summarizing across sentences, evaluating text content by giving personal comments, drawing explicit causal inferences based on text content, clarifying the information in a text, and making forward inferences. The explanations of these strategies are described below.

Elaborating on text content. In this strategy, the reader makes connection in the text with the background knowledge he/she has about the topic. During the elaboration process, readers go beyond the understanding of the textbase and extract relevant information from their prior knowledge, common sense, or logic to enrich the text (McNamra, Levinstein & Boonthum, 2004). This strategy is regarded as a kind of inference-making activity, where learners try to build up coherent connections between information from their prior knowledge and the new information from the text (Pressley & Afflerbach, 1995). This process allows readers to integrate new information from the text into the existing schema of similar topics.

The study found that both high-achieving readers and low-achieving readers used the elaboration strategy during reading. The high-achieving readers employed this strategy more frequently and their elaborations usually occurred at the sentences which were more relevant to the main ideas of the text. For example, Reader 1225 mentioned how chocolate could be an important source of calories for people who are

engaged in some physically-demanding activities when she read about high amount of calories in chocolate.

> Reader 1225:
>
> 它會帶給人們很多的熱量，這樣我會想到那個，因為老師說登山的時候，因為要有熱量啊，所以要吃巧克力。(It will give people a lot of calories. This makes me think that my teacher once said, when climbing a mountain, we need to have calories, so we need to eat chocolate.)

This elaboration presents an ideal association between the fact that chocolate has calories and how people can benefit from this. In addition, when reading about the fat in chocolate, she also mentioned, "It's hard to lose weight with so much fat in chocolate"; she also added the consequence of eating chocolate into her comprehension. These elaborations were closely related to the main ideas delivered in the text and helped her enrich the situational model about the text as evidenced in her free recall after reading.

> Reader 1225 (Text recall):
>
> 它告訴我們裡面的成分有甚麼啊，然後還跟我們說吃起來會讓我們心情愉快，就會讓我聯想到登山的人啊，然後他說白巧克力和黑巧克力有甚麼不同啊。(It tells us what the ingredients are, and also tells us that eating chocolate will make us have good mood, which reminds me of mountain climbers. And it also talks about the differences between white chocolate and dark chocolate.)

In contrast, the low-achieving readers gave more elaborations to the part of the content which was less important. The following excerpts show how the three low-achieving readers reacted to the word "hot water" in the first paragraph of the text.

Reader 1226:

我想到巧克力溶化，然後變固體。(I thought about how chocolate melts down and then becomes solid again.)

Reader 1234:

巧克力遇到熱會融化。(Chocolate will melt if it meets heat.)

Reader 1117:

我想到巧克力不能放到熱水裡面。(I am thinking that chocolate cannot be put into hot water.)

The readers similarly associated the word, "hot water" with their knowledge about how chocolate would melt when heated. This association is correct. However, it doesn't relate to the major themes of this text, so it does not help them generate more concise and pertinent situation models. This finding suggests that facilitatory effects of elaborations depend not only on how rich the additional information is, but also on the degree of relevance with the main ideas of the text. This process requires readers to screen out irrelevant information and focus only on the essential points

during the course of reading.

Summarizing. Another reading strategy used very frequently by the high-achieving students is the integration of different parts of the text into a big picture by providing a summary across several sentences. To generate a summary, readers need to distinguish the important ideas from other irrelevant information and synthesize these ideas into a simplified and coherent statement that could stand for the original text (Pressley & Afflerbach, 1995; Dole et al., 1991). In addition, summaries generated across sentences also help readers sustain their memory about the main ideas in the text. This lays an important foundation for the construction of situation models about the whole text after reading.

Take the verbal report of Reader 1107 who is an average-achieving student as an example. After finishing reading each paragraph, he stopped and provided a succinct statement to conclude the main idea of each paragraph. The four summaries he produced for the four paragraphs are shown below.

> Reader 1107:
>
> 1. 就是介紹可可亞，介紹巧克力這種東西，還有裡面的製造成分。(It is about introducing cocoa, introducing chocolate and its ingredients.)
>
> 2. 雖然黑巧克力不是很甜，但是它會幫助，對我們人體造成好的影響。(Although dark chocolate is not so sweet, it will help us, will have good influence on human body.)
>
> 3. 就是他拿白巧克力和黑巧克力作比較。然後有一些不好的東西在巧克力裡。(Here it uses white chocolate to compare with dark chocolate. And there are some bad things inside the chocolate."

4. 這個就告訴我們不要吃太多這種東西，不然會變胖。(This is to say that we should not eat too much of this thing, or we will become fat.)

In effect, from his verbal report, I could see that he encountered many word problems which he could not solve directly. He resolved this problem by skipping over these unknown words and kept on reading. He would pause at the end of each paragraph and try to organize and identify the more important messages across the sentences through summarizing. In this way, he could still extract the relevant and correct information without the unknown words. This strategy significantly supports his comprehension. His text recall below demonstrates a very detailed and sound understanding of the text, in which most of the information was also mentioned previously in his summaries.

> Reader 1107 (Text recall):
>
> 就認識巧克力啊，它的種類，還有比較。就是白巧克力，黑巧克力，還有一些不同種的巧克力，他就是白巧克力跟黑巧克力的不同種的成分，然後就是比較，他說黑巧克力會帶來我們身體一些好處，然後白巧克力就是和那個甚麼糖類一樣。還有吃一點點的巧克力就是身體會帶來好處。(It talks about chocolate…different kinds of chocolate. And it also compares white chocolate, dark chocolate and some other kinds of chocolate. It talks about different ingredients in white chocolate and dark chocolate. And then it also compare, it says dark chocolate can be helpful for our bodies, and white chocolate is like some candy. And eating a little of chocolate will do good to our bodies.)

The finding on the relationship between summarization and reading comprehension indicates that summarizing across several sentences might be a more effective top-down strategy to overcome word problems instead of trying to determine the meaning of the word from its immediate context.

Evaluating and responding to text content. Evaluating the information in the text based on personal preferences or opinions was employed very often by both the high-achieving and low-achieving readers during reading. Evaluations usually occur in reaction to particular information in the text with respect to the writing style or the text content (Pressley & Afflerbach, 1995). The use of evaluation strategies shows that readers try to "personalize" the content by connecting the new information in the text with their subjective preferences or life experiences. Evaluation with personal comments might be the first step to transform the "cold information" in an expository text into "hot" knowledge as more personal thoughts and emotional responses are infused (Lin, 2009).

For example, in reading this text on chocolate, a common evaluation from the readers was to refer back to their own attitude toward chocolate. Take the readers' responses to the sentence about how chocolate makes people happy because of the caffeine it contains as an example. Reader 1225 commented, "I feel exactly the same way when I eat chocolate". Reader 0617 also expressed his opinion, "I agree with this. I love to eat chocolate".

Some readers seemed to reflect on their own experiences with chocolate and examined whether their experiences were congruent with the messages in the text. For instance, Reader 0619 commented, "It's strange. I haven't had this kind of feeling

when I eat chocolate".

Other kinds of evaluative reaction include the readers' excitement about learning a new piece of knowledge. For example, knowing that one ounce of chocolate might have 150 calories, the readers exclaimed, "Wow, that's a lot!" *(from Reader 1104)* or "That looks horrible!" *(from Reader 1101)*.

As could be seen, these evaluative reactions were expressed in a more colloquial tone with abundant subjective views and informal expressions. This shows the readers did not merely approach the messages in this expository text as learning a piece of purely objective and distant knowledge. Rather, they actively responded to the text with personal opinions through constant evaluations. This process reflects that L2 reading also possesses the nature of constructively responsive comprehension as in L1 reading (Pressley & Afflerbach, 1995).

Drawing explicit inferences based on text content. Drawing causal inferences across sentences in a text is a crucial process to generate learning from expository texts (e.g., van Dijk & Kintsch, 1983; Zwaan & Radvansky, 1998; Zwaan & Brown, 1996; Magliano & Graesser,1991). This strategy could be observed from readers' explanations about the causal relationships among the propositions in a text or conjectures through combining the ideas in a text with their prior knowledge. This kind of statement is equivalent to the concept of "macrostructure" in the C-I model (van Dijk & Kintsch, 1983; Pressley & Afflerbach, 1995). The C-I model defines macrostructures as readers' mental representations of how different propositions are interconnected. According to Graesser, Singer and Trabasso (1994), inferences are generated automatically during text comprehension based on the assumptions that

reading is goal-oriented, and readers aim to achieve comprehension coherence locally and globally.

The common inferences in on-line text processing include bridging inferences to link different sentences locally and causal inferences that explain the relationships among different ideas in the text (McKoon & Ratcliff, 1992). In this study, the frequency of drawing explicit inferences from the sentences by the high-achieving L2 readers is higher than that by the low-achieving readers to a large extent. Moreover, this study found qualitative differences in the types of inferences between the high-achieving readers and the low-achieving readers. The low-achieving students constructed bridging inferences mostly. Their inferences were generally related to connecting two or three nearby sentences. The excerpts below are examples of such bridging inferences. These examples show that the reader focused on sorting out the relationships across different sentences and identifying the main ideas at the local level.

Reader 0629:

1. 很熱的地方會喜歡吃巧克力。(People in a hot place like to eat chocolate.)

2. 所以很多人都會很胖，因為它們吃錯了，從上面看下來的話，好像就是吃到不好的巧克力。(Many people become fat because they eat the wrong thing. From the previous sentences, it seems that they eat the bad chocolate.)

In contrast, the high-achieving readers generated more causal inferences that

depicted a major message across paragraphs or were connected with their prior knowledge about the topics. Below is a list of causal inferences from five high-achieving readers. These causal inferences are related to comparing dark chocolate and white chocolate, how much chocolate is appropriate, and possible applications of dark chocolate.

Reader 1101:

喔，他說白色巧克力，所加的抗氧化物並沒有像黑色巧克力那麼好。那應該要多吃那個黑色巧克力少吃那個白色巧克力。(It says that in white chocolate, the antioxidant is not as good as that in dark chocolate. So we should eat more dark chocolate and eat less the white chocolate.)

Reader 1104:

1. 巧克力用處還滿多的。(There are still many benefits in chocolate.)

2. 白巧克力的話，是比黑巧克力比比較不好的。(White chocolate is worse compared with dark chocolate.)

Reader 1119:

1. 黑色巧克力比較少問題 (Eating dark chocolate is less problematic.)

2. 所以少吃一點巧克力對我們身體會比較好，不要吃太多，適量就好。"(So eating less chocolate will be better for our bodies. Don't eat too much. Just eat appropriate amount of it.)

Reader 1124:

1. 那個黑巧克力有好的抗氧化物，所以吃黑巧克力會抗老? (Dark

chocolate has good antioxidants, so can eating chocolate help defy aging?)

2. 黑巧克力比較會提神，所以上課前可以吃一點巧克力。(Dark

chocolate can increase our attentiveness, so I can eat some chocolate before

the class.)

Reader 1131:

他說巧克力可以那個..提振精神。就是上那個大夜班的可以吃。

(It says that chocolate can...boost up our spirits. So people working for

night shift can eat [dark chocolate].)

These excerpts show that the high-achieving readers made more global

inferences to incorporate ideas from different parts across the paragraphs to derive a

major statement. For example, after finishing the third paragraph about white

chocolate, the readers reflected back upon the previous paragraph and made the

inference that eating dark chocolate should be better than white chocolate because it

has less antioxidants or caffeine. Also, in reading about calories in chocolate, many

readers drew similar conclusions that we should only eat a little or appropriate

amount of chocolate everyday to avoid obesity. These inferences are clearly the main

messages this text intends to convey but are not explicitly stated in the sentences.

Moreover, the readers not only inferred the main ideas within the text, but also

associated the main ideas in the text with their background knowledge or experiences

to construct new knowledge that this text might not aim to deliver. For example, one excerpt above shows that when knowing that the dark chocolate has antioxidants, Reader 1124 wondered whether dark chocolate could help defy aging as well because of the antioxidants. It is possible that she made such inference because the information about the anti-aging effects of antioxidants has been highly emphasized in many advertisements of cosmetic products in Taiwan. Hence, based on this prior knowledge, she tried to examine the link between dark chocolate and anti-aging effect.

Another example of integrating prior knowledge into the current text messages is from the readers' inferences on the information that caffeine can increase attentiveness and feelings of happiness. This knowledge led the readers to think about utilizing such benefits as eating dark chocolate in their daily life. The inferences about eating dark chocolate to increase attentiveness in class or at work are good examples of how the L2 readers could apply the information from the L2 text into daily practice appropriately.

To conclude, the inferring process described above is similar to the third stage of complex reading defined by the NAEP 2009 Reading Framework (NAGB, 2008), which refers to readers' abilities to "… draw on the ideas and information they have acquired from text to meet a particular purpose or situational need" (p3). In the context of L2 reading, the causal inferences constructed by the L2 readers in this study strongly demonstrates that L2 learners could go beyond analyzing the linguistic content of a L2 text and further applying that knowledge from the text in real-life situations to solve problems or serve their own purposes.

Clarifying unclear information. Clarification is a process similar to the strategies

in the category of interpreting in Pressley and Afflerbach (1995), which involves visualizing concepts or relations in a text, instantiating prior knowledge and judging the underlying meanings or the authors' purposes. During reading, the L2 readers asked themselves questions to clarify the meanings of the sentences or created mental images to visualize the unclear content. These clarification activities were carried out to identify problems or to prepare for exerting more cognitive resources to the confusing parts of the text.

Clarifications with questions usually occur when the sentence convey a message which is different from the reader's prior knowledge or hinders the flow of their comprehension. These incongruent incidents draw the readers' attention and raise their awareness to take more actions. As described by Palincsar and Brown (1984), the triggering moments for questioning and clarifying could be when readers realize that an expectation is not confirmed or when unfamiliar concepts are encountered too frequently to ignore.

From my observation, the high-achieving readers used this strategy more frequently than the low-achieving readers. The excerpts below show how the readers attempted to elucidate the unclear information by asking more questions related to personal experiences or creating mental images to illustrate the details in the text.

> Reader 0629:
> 真的喔，我吃巧克力是為了好吃而已，它真的可以引起專注喔? (Really? I eat chocolate only because it is delicious. Can it really increase attentiveness?)

Reader 1104:

我想說，巧克力..他這篇這樣說的話，如果是這樣的話，如果說，那巧克力吃的話會這樣的話是不是因人而異啊?我吃的時候只有苦味而已，然後就沒甚麼感覺啊。（I am thinking, chocolate, …if what this text says is true, then is the effect [of chocolate] different for different people? When I ate chocolate, I only felt its bitterness. I did not have any other specific feeling.)

Reader 1119:

為什麼會提到 kiss，糖果啊?(Why does it mention candy kiss here?)

Reader 1121:

就是想到一顆心臟在跳吧。(I am imaging a beating heart now.)

From the excerpts, the readers reported a feeling of bewilderment when what they read in the text was not consistent with their personal experiences of eating chocolate. For example, Reader 1104 stated that he did not have any particular feelings (e.g. being more focused or happier) when eating chocolate, which is why he generated a question to analyze the validity of this message.

Visualizing abstract or unfamiliar ideas in a text was also an effective way for readers to achieve a more concrete understanding about the text. For instance, to disambiguate how antioxidants affect heart conditions, Reader 1121 tried to draw a mental picture of a beating heart in her mind. These clarification activities exemplify how the readers fostered a situation model which encoded their personal interpretations about the content.

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Making forward inferences. The process of making forward inferences is like a "psychological guessing game", an analogy used by Goodman (1968) to describe how readers rely on their background knowledge about the content and the text structures to predict the incoming messages during reading. According to Pressley and Afflerbach (1995), predictions could be induced by meaning cues, structural cues and cues about the purposes of the author or the text. Using these cues, readers could retrieve the most relevant schemata about the text from their prior knowledge to further facilitate the comprehension process.

This is another strategy used mainly by the high-achieving readers only in this study. The study found that the readers collected the meaning cues in making predictions most often. For example, Reader 1101 constantly tried to predict what the text was going to say and expressed some emotional responses, such as anticipation or curiosity. When reading about the relationship between chocolate and heart health, he said, "I think it will say something about health. I am so curious what it will say". As he learned that white chocolate doesn't have as much caffeine as dark chocolate, he commented, "I feel it is going to say something bad about white chocolate. I really want to find out what it will be". In reading the paragraph about chocolate and fat, he even stopped and sighed," I know it is going to say some horrible things. I don't want to keep reading". Obviously, he was deeply involved in the meaning construction process as he read this text cognitively as well as emotionally. He not only understood the literal meanings of the sentences but also drew sound forward inferences about what the text might lead him into and generated emotional responses associated with his predictions.

There were also readers who made good use of the structural cues to make

predictions about the text. For instance, Reader 1228 was aware that this text used a structure of comparison to contrast different kinds of chocolate. As she read the first paragraph, she noted," It should be saying that the ingredients in white chocolate are not as good as those in dark chocolate next". When she finished reading the second paragraph about the benefits of eating dark chocolate, she forecasted, "I think the last paragraph should talk about something bad about chocolate". The awareness of the hidden structure in the text drove her to make these predictions, which were all correct and successfully guided the comprehension process. Her text retell below illustrates how this structural knowledge helped her organize her comprehension of the text.

> Reader 1228:
>
> 它一開始是先講說巧克力的來源，還有它是從哪個地方，然後開始講黑巧克力有甚麼好處，然後他含有咖啡因，跟白巧克力不一樣，白巧克力的咖啡因比較少一點，最後大概是講說，每一天吃一點點就好了，不然對身體不好。(It firstly talked about the origin of chocolate and where it is from. And then it talks about the benefits of dark chocolate, and that it contains caffeine. It is different from white chocolate and white chocolate has less caffeine. Lastly, it says that we should only eat a little ~~of~~ chocolate every day, otherwise it will do harm to our bodies.)

From her predictions during the think-aloud, it could be seen that she already activated her knowledge about the text structure of comparison and contrast to support her comprehension about the differences between dark chocolate and white

chocolate as she read along. Therefore, she could further use this structure to organize the information from the text in her recall. For instance, in her situation model of the text, she used the transitional words, such as "first", "and then" and "lastly" to structuralize her memory of the text. This recall provides evidence about the close relationship between metalinguistic processing and text comprehension.

Metacognitive strategy use

Metacognitive strategies refer to mental procedures that allow readers to plan, monitor, and evaluate their ongoing performance to accomplish the comprehension goal (Dole, Nokes, & Drits, 2008). In this study, two metacognitive strategies applied by the L2 readers to monitor and regulate their comprehension progress are identified. They are: "monitoring the comprehension coherence or difficulty level" and "planning on executing solutions to solve problems".

Monitoring the comprehension coherence or difficulty level. The monitoring strategy was used frequently by the high-achieving readers to detect their comprehension problems. Most of the low-achieving readers only commented on the difficulty they felt about the text by saying "It is so hard" *(from Reader 0617)* or "I feel confused. I don't understand it" *(from Reader 1212)* as they stumbled in decoding the linguistic input of the text. Then, they usually kept on reading without making extra efforts to go through the problems they encountered in more detail.

In comparison, the high-achieving readers were more able to indicate why they felt it was difficult during reading or which part confused them. For example, Reader 0617 pondered on what was actually referred to by a pronoun as he said, "It says this is a good news. It seems to say the whole thing, doesn't it? I am not sure". The high-achieving readers also monitored whether the meanings in the text were logical

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and reasonable. For instance, Reader 1111 mistakenly inferred the new word. "antioxidant" in the second paragraph to mean "sugar blood". Therefore, he detected a contradiction between his world knowledge about sugar blood and the message in the second paragraph by explicitly pointing out, "I don't understand here. Why…The sugar blood should go up, right? Why does it say it decreases here?" This utterance shows that he not only discovered the mismatch between his prior knowledge and the current information in the text but also went back and forth across the sentences to search for possible explanations.

In these remarks, the high-achieving readers are shown to execute better monitoring by attending to the textual details, examining the causal relationships and finding the problems that might cause confusions than the low-achieving readers. As noted in previous studies, comprehension monitoring is a vital metacognitive processing because it initiates following actions, such as selecting a particular strategy or shifting strategies, in order to solve the comprehension problems within a specific task context (Baker & Brown, 1984; Pressley & Afflerbach, 1995; Block, 1992; Samuels et al., 2005). More sophisticated use of monitoring strategy is highly critical for readers to further plan and to decide on proper solutions to deal with the comprehension blunders.

Planning on executing solutions to solve problems. In addition to the more frequent use of monitoring strategy, the high-achieving readers were also more actively engaged in the strategic process of planning for solutions when encountering comprehension problems. The low-achieving students, on the other hand, barely reported the use of it. According to Block's (1992), comprehension monitoring in L2 reading consists of the problem identification phase, the planning phase, and the

action phase. When monitoring the occurrence of a difficulty, the high-achieving students were more able to devise and carry out the planning strategy thoughtfully. During the process of planning, they would set up a temporary solution, indicate the reason for this decision, and then execute it.

Take the verbal report of Reader 0617 as an example. When she read the sentence about the original meaning for the word "chocolate" in Spanish, she could not understand the meaning of the whole sentence; she could only recognize several words in isolation. As she was not certain about how "hot water" was related to the other words in the sentence, she decided, "Maybe later there would be some explanations in the text, so I should skip it here". Also, when she was reading about the ingredients in white chocolate and was feeling overwhelmed by many unfamiliar nouns, she stated, "I think I should go back to read the previous sentence again". Reader 0927 also provided a more thorough explanation for her decision to skip an unknown word as in the following.

> Reader 0927:
>
> 我想先不要猜，先看後面的句子，再看看可不可以把意思串起來。
>
> (I don't want to guess its meaning now. I want to read the following
>
> sentences first to see if could connect the meanings together.)

Skipping unknown L2 words in a sentence and continuing to read was a common reading activity that occurred frequently in the verbal reports of the low-achieving readers. They usually did not use it as a result of a careful and planful decision. Rather, most of the low-achieving readers skipped the unknown words to

get away from the difficulty, instead of trying to solve the problems. On the other hand, the high-achieving readers appeared to make the decision of skipping through the planning process. In their think-aloud reports, their planning strategy usually included remarks that indicate the problem space, solutions that draw upon their prior experiences, and reasons to explain their decisions. The use of this metacognitive strategy also demonstrates that skilled L2 reading process is structured, organized and goal-oriented.

Frequency counts of the reading strategy use

To observe the patterns of the readers' strategy use, Figure 4.1 presents the strategy use frequencies of the 36 readers identified from the their verbal reports. A total of 1037 strategies were identified. For each reader, the total number of strategies ranged from 41 to 8; on average, every reader produced 28.80 strategic actions during reading with a standard deviation of. 7.45. Figure 4.1 illustrates the readers' strategy use frequencies in a bar chart.

Figure 4.1. Strategy Use Frequencies in the Think-alouds of the 36 Readers
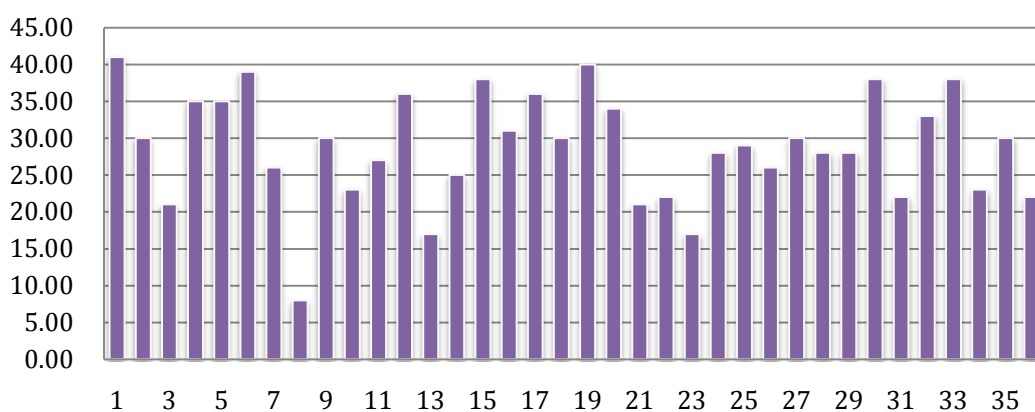
Then, the frequency counts of each strategy were calculated. It should be

reminded that think-aloud protocols are still limited in presenting a full account of readers' unobservable strategic activities. Therefore, conclusions based on frequency count comparisons from think-aloud data should be drawn with caution.

Table 4.15 offers the number of frequency counts for the 12 strategies from the 36 readers. Figure4.2 is a visual representation of the frequency counts across the strategy categories.

Table 4.15. *Reading Strategy Use Frequency Count*

	C1	C2	C3	C4	C5	C6
The 8th- grade readers (n=36)	454 43.78%	137 13.21%	37 3.57%	186 17.93%	21 2.02%	42 4.05%
	C7	C8	C9	C10	M1	M2
The 8th- grade readers (n=36)	27 2.60%	72 6.94%	19 1.83%	10 .96%	24 2.3%	8 .77%

Note. C1: Word-by-word translation C2: Paraphrasing C3: Determining an unknown word's meaning C4: Determining the meaning of a sentence. C5: Elaborating on the text C6: Summarizing across sentences C7: Evaluating the content C8: Drawing explicit causal inferences C9: Clarifying unclear information in the text C10: Making forward inferences M1: Monitoring the comprehension coherence M2: Planning on executing solutions to solve problems

Figure 4.2. Bar Chart of the Reading Strategy Use Frequency Counts
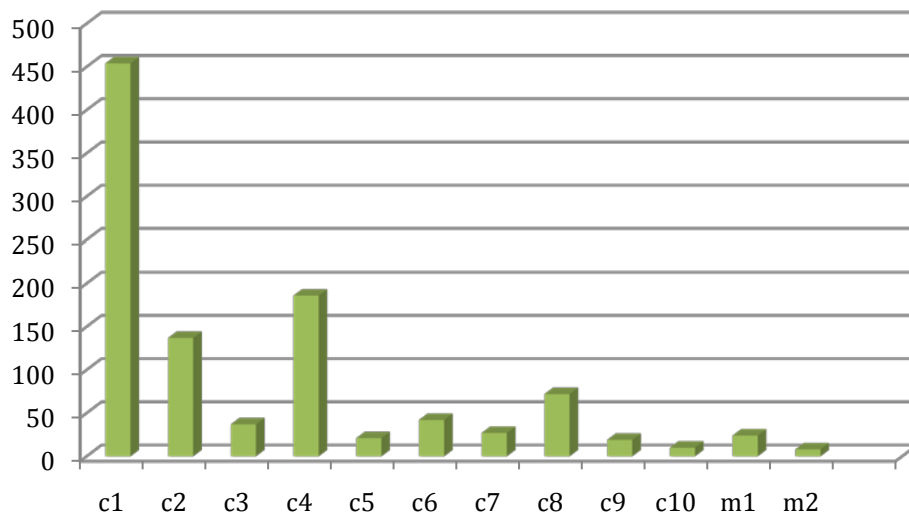
Note. C1: Word-by-word translation C2: Paraphrasing C3: Determining an unknown word's meaning C4: Determining the meaning of a sentence. C5: Elaborating on the text C6: Summarizing across sentences C7: Evaluating the content C8: Drawing explicit causal inferences C9: Clarifying unclear information in the text C10: Making forward inferences M1: Monitoring the comprehension coherence M2: Planning on executing solutions to solve problems

It could be seen that the most frequent strategies in use by these readers are word-by-word translation (C1), translation through paraphrasing (C2) and determining the meaning of a sentence (C4), which accounts for 74.92 % of total strategy use. These strategies are all related to building up textbase and achieving literal comprehension of the text at the sentence level.

As for the situation model construction, the strategies on elaborating the basic understanding of the text, such as drawing inferences from the sentences (C8, 6.94%) and summarization (C6, 4.05%), are initiated more often than other types of situation model construction strategies. Overall, the graph shows a gradual decline in the use of the higher-order strategies that are used to generate an integrated situation model connecting to readers' prior knowledge.

Compared to the comprehension strategies, these readers, in general, does not

report much of metacognitive strategy use. The two metacognitive strategies in total only account for 3.08% of the total strategy use in the think-alouds (Table 4.15). It might be due to that metacognitive thoughts or behaviors are inherently less able to be verbalized. Also, for these beginning L2 readers, their work memory might be fully occupied by this demanding tasks, such as decoding linguistic input and constructing coherent comprehension, so there was little room left for them to explicitly reflect and evaluate the reading process metacognitively.

Furthermore, drawing upon the "good language learner" perspective (e.g., Jimenez, Garcia & Pearson, 1996; Brantmeier, 2002; Chuang, 2007), I also compared the differences in strategy use between proficient L2 readers and less-proficient L2 readers. Using their mid-term English examination scores, the selected proficient L2 readers are students who scored above the top 25% (n =11, mean= 94.73, SD=1.68), and the less proficient L2 readers are those with scores below the 75% in the sample (n= 9, mean= 54.00, SD= 14.31). The frequency counts of the two groups are offered in Table 4.16 and the bar chart is presented in Figure 4.3.

Table 4.16. *Reading Strategy Use Frequency Counts of the High-achieving Readers and the Low-achieving Readers*

	C1	C2	C3	C4	C5	C6
High-achieving readers (n=9)	150	64	16	48	7	16
Low-achieving readers (n=11)	94	10	6	61	3	9
	C7	C8	C9	C10	M1	M2
High-achieving readers (n=9)	10	30	9	3	11	5
Low-achieving readers (n=11)	6	5	1	0	3	0

Note. C1: Word-by-word translation C2: Paraphrasing C3: Determining an unknown word's meaning C4: Determining the meaning of a sentence. C5: Elaborating on the text C6: Summarizing across sentences C7: Evaluating the content C8: Drawing explicit causal inferences C9: Clarifying unclear information in the text C10: Making forward inferences M1: Monitoring the comprehension coherence M2: Planning on executing solutions to solve problems

Figure 4.3. Bar Chart of Reading Strategy Use Frequency Counts between the High-achieving Readers and the Low-achieving Readers
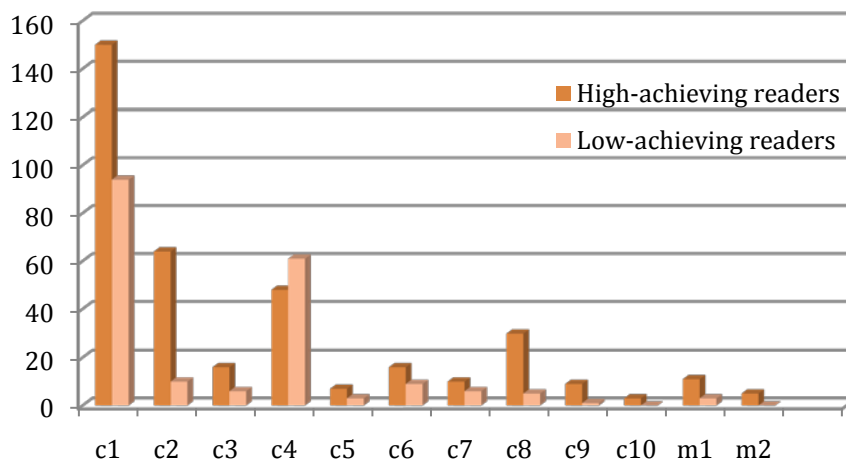
Note. C1: Word-by-word translation C2: Paraphrasing C3: Determining an unknown word's meaning C4: Determining the meaning of a sentence. C5: Elaborating on the text C6: Summarizing across sentences C7: Evaluating the content C8: Drawing explicit causal inferences C9: Clarifying unclear information in the text C10: Making forward inferences M1: Monitoring the comprehension coherence M2: Planning on executing solutions to solve problems

According to the comparisons of reading strategy use frequency between the high-achieving readers and the low-achieving readers, it is found that except for determining the meaning of the sentences, the proficient L2 readers use all the other strategies, including translating L2 into L1, inferring the meaning of an unknown word using contextual cues, summarizing, elaborating the meaning, and engaging in metacognitive monitoring, more frequently than the low-proficient readers. It supported the findings from Sheorey and Mokhtari (2001) and Mokhtari and Reichard (2004) in that good language learners do not just use more global and top-down strategies. Rather, they also employ more bottom-up strategies during reading that focuses on textbase construction. In other words, regardless of the types of strategies, good language learners are also skillful strategizers who generally use more strategies with higher frequency.

In addition, the frequency counts show that the low-achieving readers rarely used the metacognitive strategies to regulate their comprehension process. This result might reveal the reality that the eighth-grade learners in Taiwan generally are not equipped with essential strategic knowledge and practices to execute metacognitive monitoring in reading processes. This issue could be a cause for their low academic performance as well as the result of the traditional lecture-based, knowledge-centered instruction the students receive at school.

Research Question 2. What are the Sources of Situational Interest in L2 reading for Eighth Graders and How do the Sources of Interest Relate to Readers' Perceived Interest?

To address this question, the qualitative analysis focuses on identifying the specific text characteristics that could induce readers' interest perceptions following

the procedure employed in the study by Wald et al. (1999). In the retrospective interviews, I asked the readers if they considered this text was overall interesting or not, and instructed them to provide reasons for their answers. In addition, I also asked them to point out the most interesting paragraphs and the most uninteresting paragraphs among the four paragraphs of the text. Their answers were transcribed verbatim in Chinese and then coded for types of sources for situational interest.

Table 4.17 presents the readers' responses in evaluating the overall interestingness of the text, the interesting/uninteresting paragraphs and the types of text characteristics related to their interestingness judgments. The first major column lists the number of the readers who judged this text is overall interesting/uninteresting for them and the frequency counts of the readers' reasons why the text is interesting or uninteresting. The second major column reports the frequency counts for each paragraph judged as the more interesting part of this text and the total responses for each sources of situational interest when they were mentioned by the readers as the reasons for the interestingness of the paragraphs. The third major column offers the frequency counts for each paragraph judged as the less interesting part of the text and the total responses for each sources of situational interest as the reasons for the uninterestingness of the paragraphs.

Table 4.17. *Sources of Situational Interest and the Number of the Readers' Responses*

Sources of situational interest	Overall Evaluation of the Text Total number of responses		Interesting Paragraph Total number of responses				Uninteresting Paragraph Total number of responses			
	Interesting	Uninteresting	1st	2ed	3rd	4th	1st	2ed	3rd	4th
	18	18	3	14	4	13	12	13	0	6
Comprehensibility	_	17	9				17			
Novelty	8	_	7				2			
Importance	5	_	7				8			
Relevance	2	_	5				_			
Topic preference	4	_	3				2			
Correspondence to prior knowledge	1	_	2				_			
Text genre	1	2	_				_			
Interest in English	1	1	1				_			
Total responses	22	20	34				29			

In general, 50% of the readers regarded this text as interesting and 50% of the readers did not give positive judgments about the interestingness of the text. Among the four paragraphs, the second paragraph is reported to be the most interesting based on 41.17% of the responses, followed by the fourth paragraph (38.23% of the total responses). The least interesting paragraph is also the second paragraph based on 41.94 % of the total responses. The first paragraph is ranked as the second least interesting (38.71%). The readers offered a variety reasons for their perceptions about the interestingness of the text and each paragraph. From the interviews, I identified

eight elements related to their interestingness judgment. They are: (1) comprehensibility, (2) importance, (3) relevance, (4) topic preference, (5) novelty, (6) correspondence to prior knowledge, (7) text genre, and (8) personal interest in English. These eight sources of situational interest are aligned with previous literature on reading interest in L1 reading research (Wald et al., 1999; Kintsch, 1980; Fox & Alexander, 2004; Alexander, 1997; Hidi, 1990; 2001; 2006; Schiefele, 1991; Krapp, 2002) as well as in L2 reading research (Brantmeier, 2006).

In the following sections, I will describe the five text characteristics positively associated with the readers' situational interest. These sources are novelty, importance, relevance, topic preference, correspondence to prior knowledge, and personal interest in English. I will then report the two text characteristics and one other source that negatively impact their interest perceptions, namely, comprehensibility of the text, text genre, and personal interest in English.

Text characteristics and other sources most positively related to situational interest

Novelty. Novelty refers to new information contained in the text or the information is unfolded in a surprising or unusual way to readers. According to Kintsch (1980), the unexpectedness of events in a text can influence readers' interest. If the text information is too familiar or entirely predictable, it will not generate too much interest or curiosity from readers.

Among the eight sources of situational interest, novelty is the category that receives the most positive responses. In the interview data, there are eight related remarks (36.36%) in the overall evaluations and seven related remarks in the paragraph evaluations (20.59%). Many readers considered the second paragraph of the text as the most interesting because it contains information about the effects of

chocolate on health, which is totally new or different from their prior knowledge. The exemplar comments include "I like the second paragraph, because it talks about how dark chocolate would affect our bodies. I don't usually think about it this way", "I like this paragraph because it talks about some ingredients in chocolate that I have never heard before", "I think it is interesting because I can learn some new things from it", and "I didn't know it has caffeine in chocolate before". The fresh knowledge about the differences between dark chocolate and white chocolate is also often cited as the reason that makes this text interesting by the readers. This finding suggests that L1 and L2 reading shared a universal cognitive purpose; which is to construct meaning and initiate learning (Pressley & Afflerbach, 1995), during which the novelty of the information helps increase readers' curiosity and deepen their engagement.

Importance. Three text characteristics for increasing situational interest are revealed in the interviews. These are related to the value-related valances in Schiefele's theory of individual interest (1991; 1992). These text characteristics are "importance", "relevance" and "topic preference". In this theory, value-related valances refer to how individuals identify the importance or personal significance of a certain topic. The present study finds that the L2 readers not only made the interestingness judgment based on the comprehensibility of the text, but also highly emphasized the value of the information in the text.

Importance of the information is one major component of the value-related valances. To decide which paragraph is more interesting, 7 responses (20.58%) mentioned that the importance of the information is a major criterion for them to choose a certain paragraph. Most of the remarks in this category concern with the

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readers' judgments about how worthwhile it is to learn about the health or calorie issues in the text.

For example, Reader1112 responded, "I would say the most interesting paragraphs are the second and the third paragraphs, because they are comparing the differences between dark chocolate and white chocolate and talks about something which would affect health. I think these are important things to know". Reader 1120 favored the fourth paragraph because "It talks about calories and fat in chocolate. It is worth knowing". These remarks show that the readers pay great attention to the significance of the information in the text, which in turn influence their interest perception in reading the text.

Relevance. Relevance refers to how readers compare the relevance of the content with their personal life or prior knowledge to evaluate the interestingness of the text (Wald et al.,1991). A total of 2 responses in the overall evaluations (9.09%) and 5 responses (14.71%) in the paragraph evaluations are classified into this category. As the readers recognized the relevance of the information, they tended to give positive evaluations about the interestingness of the text.

The characteristic of relevance was frequently mentioned by the readers who indicated that the fourth paragraph about the amount of calories in chocolate is most interesting for them. The readers described that " This paragraph is more relevant with things in our daily life, and I personally also care about the fat issue", "I can know which things will make me fat", "This information is more relevant to my life" and " I think eating chocolate and becoming fat are something more useful to know for me". The dependence on the criterion of relevance to make the judgments implies that as the readers were comprehending the text; they also constantly reflected upon

the usefulness or the relationship between the content and their personal backgrounds. This bridging process from a more personal perspective is also the key aspect of reader-text interactions during meaning constructions (Bernhardt, 2002; Pressley & Afflerbach, 1995).

Topic preference. Topic preference relates to individuals' preference for the topics in a text. There are 4 such responses (18.18%) in the overall evaluations and 3 responses (8.82%) in the paragraph evaluations. The responses usually contain the readers' descriptions about how their personal cravings for chocolate influence their interest perceptions. The exemplar comments are "I like it because I like chocolate" and "I love eating white chocolate so I like this paragraph". These responses explain that the readers have more positive evaluations about the interestingness of the text because of their subjective and personal preferences for the specific topics. This type of interest pertains to topic interest or individual interest, which is more stable and usually less affected by text characteristics (Fox & Alexander, 2004; Alexander, 1997).

Correspondence to prior knowledge. The readers also made positive judgments about the interest level of the text if the information corresponded with their prior knowledge. This category received 1 response (4.55%) in the overall evaluations and 2 responses (5.88) in the paragraph evaluations. The readers indicated that their interesting perceptions were induced because the text contains some knowledge that they have known before so that they could make connections more easily.

For example, Reader 1225 explained, "I like the second paragraph because it talks about something that could make people feel happy. I have learned this before and now it confirms what I have known". In other words, familiarity with the

information could also be a source for situational interest as well as the novelty of the information.

Correspondence between the text contents and readers' prior knowledge was also cited by one reader as a source that decreased his situational interest in the text. He clearly claimed that having the knowledge about the topics in the text is what makes him dislike a certain paragraph. "I don't like reading the fourth paragraph because I have already known these things".

Moreover, this study found that among the positive sources for situational interest, the proportion of the responses in the category, "correspondence to prior knowledge" is relatively smaller than that of the novelty category (4.55% vs. 36.36%). This finding indicates that most of the readers in this sample still prefer reading L2 texts with which they could learn new information rather than familiar facts. As Kintsch theorizes (1980), interest increases as more prior knowledge is involved and diminishes at the point where readers do not need to read anymore to learn new information. The results from this study seem to partially capture this curvilinear relationship between prior knowledge and interest during reading of this expository L2 text.

Text characteristics and other sources most negatively related to situational interest

Comprehensibility refers to the linguistic comprehensibility of a text to L2 readers, which could be influenced by lexical difficulty or grammatical complexity in the text. From the interviews, comprehensibility is the primary factor reported to strongly inhibit situational interest in reading the L2 text. 17 responses (85%) indicated that too much unknown vocabulary in the text is the reason why they judged it as uninteresting. To decide which paragraph is the least interesting, the

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second paragraph received the most responses because it is also the most difficult part of the text with many new words and complex concepts (17 responses= 58.62%).

Many readers reported a feeling of frustration when they could not recognize the vocabulary and failed to fluently translate the text into meanings. For example, Reader 1117 concluded, "This paragraph was so boring because I could not understand it at all. When I could not understand, I got upset and felt so annoyed that I don't' want to read anymore". Likewise, in comparing the interestingness of each paragraph, many readers selected the easiest paragraph as the most interesting one.

Kinstch (1980) explains why comprehensibility plays a fundamental role in L1 reading interest by arguing "so that he is able to construct a coherent macrostructure in which text unit has its place and is meaningfully related to other sections of the text" (p. 89). The findings from the present study also reveal a strong relationship between ease of meaning comprehension and L2 reading interest. In addition, this result is in accordance with the multi-component model of interest in L2 reading by Brantmeier (2006), where ease of recollection is the most significant factor that impacts L2 reading comprehension.

Text genre is one minor source for situational interest identified in the interviews. The category of text genre is created as the readers pointed out whether they generally prefer to read expository texts such as this text on chocolate. A total of 2 responses (10%) are directly related to how the genre of this text affects the overall reading interest. Two readers indicated that they do not consider this text interesting because they personally prefer to read narrative texts rather than expository texts. Due to the fact that most of the reading materials in the readers' English textbooks are narrative texts, the unfamiliarity in reading an expository text thus negatively

influences their interest perceptions about this text.

However, there is still one reader who expressed preference for expository texts over narrative texts. He stated, "This kind of texts has a novel genre. I like to read it in English and we can also learn useful information from it". Hence, it is inferred that if L2 readers have more exposures to L2 texts written in a variety of genres, they might feel more comfortable and become more adaptable to different reading materials, and the novelty in text genres might turn into a facilitator for reading interest.

Personal interest in English. In addition to the seven text characteristics, the present study also finds that readers' interest in learning the second language, a specific source related to individual differences, has certain impacts on their reading interest for the L2 text. A total of 2 responses relates the interest perceptions to language learning motivation. One reader explained that he does not like any paragraph in this text at all because he has no interest in the subject of English, not because of the text per se.

On the contrary, the other reader emphasized that he likes to study English very much and he chose the second paragraph as the most interesting one because it is difficult and thus challenging. "I like reading this part because I like English and this part is challenging so I could see if my English is good enough to understand it". In other words, readers' language learning motivation could also indirectly influence their interest level in L2 reading. If they have low learning motivation for the second knowledge, their motivation for completing the L2 reading task would also deteriorate to a point where they withdraw from engaging in reading regardless of the text characteristics.

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Although personal interest in English is a minor source for situational interest, this finding could still contribute to the current knowledge about how language learning motivation influences learners' language performances. Previous studies on language learning motivation took a macro perspective by analyzing how the overall tendency of individuals' general language motivation was related to general learning outcomes in a broad view (e.g., Masgoret & Gardner, 2003; Oxford &Shrearin, 1994; Dörnyei, 2001). By contrast, results of this study demonstrate how L2 learners' language motivation could interact with learners' psychological processes, perceptions and comprehension during an ongoing L2 task. Approaches using think-aloud tasks and interviews could shed some light on the interactions among motivation, interest and cognition during second language processing at a more fine grain size.

Research Question 3. How do L2 Reading Strategy Use, Sources of Interest and Perceived Interest Relate to L2 Reading Comprehension?

From this sample, I identified three L2 readers who demonstrated most distinct patterns in their profiles on English proficiency, L2 reading interest, and L2 reading strategy use. Their pseudo names are *Mark*, *Alice*, and *Stella*. They could be taken as the representatives of three learner clusters in L2 reading. Mark represents the first learner cluster, characterized as having high language proficiency, high reading interest and using strategies at a deeper level. Alice represents the second learner cluster, characterized as having low language proficiency, high reading interest with superficial strategy use. Stella is an example of the third learner cluster, having high language proficiency, low reading interest and has strategy use at a superficial level.

This study has employed different assessment tools to collect rich information

about the readers' language proficiency, L2 reading strategy use, L2 reading interest and L2 reading comprehension. Therefore, I use the quantitative data from the three readers, including their English academic achievements, the strategy questionnaire scores and two reading interest scale scores, to support and validate my observations and interpretations about the readers' strategic behaviors, interest performance and reading comprehension outcomes from their think-aloud protocols, retrospective interviews and text recalls. Table 4.18 reports the three readers' performances on the nine quantitative measures: (a) English academic achievement as measured from their mid-term English examination scores, (b) the TOEIC reading comprehension test scores, (c) the *Situational Interest questionnaire* (*SIQ*), (d) the *Interest Experience Scale* (*IES*), (e) the *Congnitive-Metaconginitive Strategy Questionnaire*, (*CMSQ*), (f) *Quantity of Total Strategy Use*, (g) *Quality of Total Strategy Use*, (h) *Sophistication of Strategy Use*, and (i) the text recall scores. In addition, the means and standard deviations of the sample on the nine measures are also offered to serve as the anchoring points that can help identify the three readers' relative positions from each other on these scales.

Table 4.18. *The Quantitative Information of the Three L2 Readers and the Sample Means on the Measures of Language Proficiency, Reading Interest and Reading Strategy Use*

	English academic achievement	TOEIC reading comprehension test	The *SIQ*	The *IES*	The *CMSQ*
Sample mean (standard deviations)	82.78 (11.23)	6.78 (2.63)	19.83 (5.11)	19.61 (4.66)	73.17 (15.92)
Mark	93.00	8.00	25.00	27.00	91.00
Alice	77.00	5.00	25.00	20.00	75.00
Stella	95.00	7.00	17.00	15.00	49.00
	Quantity of Total Strategy Use	*Quality of Total Strategy Use*	*Sophistication of Strategy Use*	Text recall scores	
Sample mean (standard deviations)	28.86 (7.45)	41.22 (14.01)	1.40 (.21)	10.43 (5.48)	
Mark	39.00	65.00	1.67	20.00	
Alice	30.00	39.00	1.30	12.00	
Stella	36.00	47.00	1.31	4.5	

Mark is identified as an example of a high-achieving L2 reader who demonstrates a high reading interest in this English reading task and also uses many strategies actively with full effort during reading. His English academic achievement scores and the TOEIC reading comprehension test scores prove his higher language proficiency compared to his peers; both of the scores are above almost one standard deviation than the average. He also scores more than one standard deviation higher than the group mean on the interest-related measures. The four strategy measures from the strategy questionnaires and the think-aloud protocols also attest that he is

adept at using strategies and highly involved in the strategic processes, which in turn results in successful reading comprehension about the text. Based on this information, I regard him as a good case to exemplify the strategic and motivational processes of a good language learner.

Alice represents a L2 learner who lacks adequate language proficiency and sophisticate practices of strategy use, but expresses strong reading interest in the task. Her test results in English proficiency are about half a standard deviation below the average score. In spite of her lower language proficiency, she reveals strong reading interest in this L2 task as reflected from her high scores in the interest questionnaires.

As for the strategy measures, Alice scores above the mean of the strategy questionnaire and that of the quantity measure from the think-alouds, both of which are measures related to the total amount of strategies used for the task. However, her performances on the quality measure and the sophistication measure fall below the mean of the sample, indicating that she uses many strategies, but is not able to execute them thoroughly and sophisticatedly to aid meaning construction during reading. Hence, the profile of Alice portrays a struggling L2 learner who is interested in L2 reading, but needs more guidance to improve his/her abilities of effectively using strategies.

Stella is a notable case to represent a proficient language learner who, nevertheless, has distinctly flagging reading interest and superficial use of reading strategies when completing this reading task. From her academic achievements, it could be seen that she has outstanding test results at school, but does poorly on the *TOEIC reading comprehension test* I administered. Her scores on the interest scales is almost one standard deviation below the average, indicating her insipid interest

perception about the task. Moreover, she reports an infrequent use of strategies on the questionnaires and also produces strategies that are less efforful and reflective in the think-aloud. I also observe that her text recall score is remarkably well below the average, implying how reading interest and strategy use might pose un-negligible impacts on L2 reading comprehension apart from language proficiency. Therefore, she is selected as a significant case to highlight the role of reading interest in L2 reading.

In the following sections, I will present the strategy use sequences in relation to the original text based on their think-aloud protocols of the three readers. More detailed descriptions about each reader's performance regarding their strategy use, interest and comprehension from their interviews and text recalls will also be offered. Relevant issues or patterns emerging from the interactions among these factors in the readers' profiles will be emphasized and discussed.

Mark, a L2 reader who has high English achievement, high reading interest and uses strategies at a deeper level

From my observations on Mark's interactions with the reading task, he demonstrated a strategy use chain which occurred repeatedly across several sentences, or within single paragraphs. Figure 4.4 broadly illustrates his strategy use sequence along the timeline of his reading of the original text.

Figure 4.4. Illustration of Interactions between the Original Text and Strategy Use by a High-achieving L2 Reader with High Reading Interest

Quotes from the excerpts

"Cocoa butter..is its ingredient..so the taste of sweetness may come from this stuff."

"This part is talking about how it is produced."

"If I eat chocolate, maybe I will have the same reactions."

"I think white chocolate is worse than dark chocolate."

"From the things it says, chocolate is indeed beneficial for us."

"I am thinking, chocolate, …if what this text says is true, then is the effect different for different people? When I ate chocolate, I only felt its bitterness. I did not have any other specific feeling."

"I think white chocolate is worse than dark chocolate."

"Everything thing has two sides..Chocolate has good sides and bad sides"

"Does this mean it is not sweet in the ancient time?"

"What I am thinking is, why is chocolate hot?"

Situation model

Clarifying the information in text

Summarizing

Drawing inferences

Drawing inferences

Drawing inferences

Determine meaning of a sentence

Clarifying the information in text

Summarizing

Summarizing

Evaluating text content

Drawing inferences

Evaluating text content

Textbase

Word-by-word translation

Word-by-word translation

Determine meaning of a sentence

Word-by-word translation

Paraphrasing

Word-by-word translation

Determine meaning of a sentence

Text

"The word, chocolate comes from *chocolatl*. This is a Spanish word, meaning "hot water."

"There are several kinds of chocolate... Much of the chocolate which we eat today is sweet chocolate, combining chocolate with sugar."

"Dark chocolate is the best kind of chocolate…Caffeine can help us have good feeling, such as happiness or attentiveness."

"White chocolate is different from dark chocolate…Too many chocolate will make people fat."

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The strategy use chain of Mark usually began with reading out loud every word in a sentence in English first and then going back to translate the sentence into Chinese word-by-word or through paraphrasing. Then, he would try to expand the literal meaning of the sentence by using several situation model construction strategies, such as adding more information from his background knowledge, identifying and clarifying the particular part that confused him, summarizing or giving evaluative comments.

For example, in reading about different kinds of chocolate and their different ingredients, he used reasoning skills to infer the possible messages implied by the sentences, such as whether the cocoa butter is the source of sweetness for chocolate and whether the chocolate is not sweet in the past because one sentence says that the chocolate we eat "today" is sweet chocolate. Moreover, he also frequently evaluated the text with reference to his own personal experiences and reflected on whether chocolate could really impact himself as much as what the text describes. After initiating these situation-model-related strategies, he then went on to the next sentences and returned to the translation or word-solving process.

This strategy use chain from Mark's verbal protocol demonstrates the recursive nature between textbase models and situation models during comprehension as noted in the Constructed-Integrated Model (C-I model, van Dijk & Kintsch, 1983). C-I model explains how readers start from constructing local textbases for several sentence or phrases when the reading process launches, based on which a macrostructure is established by identifying the causal relationships. In addition, a "local" situation mode is constructed by integrating with readers' prior knowledge via multiple cognitive and metacognitive processes. The local situational models are held in readers' work memory for further updates when the reading continues and the

subsequent situation model is formed when reading the next several sentences.

Another characteristic of Mark's strategy use sequence is that he employed different situation model construction strategies flexibly and appropriately in reaction to the content of the text and the course of the reading. For example, he tended to use more textbase comprehension strategies in the beginning of the reading and more situation model construction strategies toward the end of the reading. In reading the first or second paragraph, he focused more on understanding the literal meaning of the sentences and refrained from over-elaborating the meanings based solely on his prior knowledge. In the middle of the reading, he started to add more personal opinions as he accumulated more understandings about the text. At the end of the reading, he made summaries more frequently to identify and synthesize the information he regarded as important across the paragraphs. This strategy sequence clearly assisted him to form a more detailed and relevant mental representation about the text as evidenced in his text recall below:

Mark:

白巧克力是由百分之七十的可可亞奶油做成的,黑巧克力吃的時候心情會變好也會比較專注。黑巧克力有很多的抗氧化物,可以幫助我們的身體健康,然後白巧克力則是相反的。巧克力一個大概是含一百五十卡洛里左右,然後一個新聞是說人們一天吃三十個卡洛裡的話就不會讓我們變胖,也就是說,控制好應該是好的。(White chocolate is made up of seventy percent of cocoa. When we eat dark chocolate, we will feel better and also become more attentive. Dark chocolate has a lot of antioxidants, which can improve our health, and white chocolate is the opposite. One chocolate contains about 150 calories. And then there is one news saying

that with 30 calories a day, people won't get fat. In other words, if we have

good control of eating chocolate, it should be good for us.)

In short, Mark's strategy use sequence underlines the importance of the

conditional knowledge about strategy use, which is knowledge about what strategies

are more effective in certain reading conditions (e.g., Paris et al., 1984; Oxford, 2011).

Mark might not be the reader who used a great variety of different strategies or used

strategies with the highest frequency. However, his strategy use demonstrates a level

of harmonious correspondence between the strategy choice and the linear progression

of comprehension.

With regard to Mark's reading interest in this task, his situational interest in this

text and strong English learning motivation both contribute to his engagement in this

task. In the retrospective interview, Mark considered that this text is interesting

because "I have never knew about the history of chocolate, so I have learned new

things from it". He further indicated that every paragraph is interesting because "Here

it tells us how chocolate is produced, here it says something about the mood, here it

talks about the bad sides, and here it says we could control how much we should eat.

Every paragraph has new things". Obviously, the novelty of the content continued to

raise his curiosity and sustained his interest level during reading.

Moreover, Mark also showed a passion for learning English. He reckoned that

English is interesting because he could gain a sense of achievement from reading a

difficult English text. He even had tried to read some English novels on his own,

which is quite rare for a junior high school student in Taiwan whose life is usually

occupied by taking additional classes in cram schools or preparing for tests. These

interest sources from the content of the text or from the language itself synergize

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together and become a powerful drive behind his deep involvement in executing strategies to comprehend this L2 text.

The weaving between reading interest and reading strategy use is manifested by his reply to the interview question about his degree of involvement during the task. He specified that he was quite absorbed in reading and felt that "I spent eighty percent of the time reading and twenty percent of the time thinking about questions or things about this text". His think-aloud report also confirms that he seemed highly engaged in the strategic processes of forming situation models with his prior knowledge through the question-generating process. Also, his interests in the content of the text and English would be the indispensible catalyst to fuel such processes.

Alice, a L2 reader who has lower English achievements, high reading interest and uses strategies at a superficial level

Alice is viewed as a low-achieving student in terms of her overall lower English test scores. Hence, she is assumed to experience difficulties in reading this text due to its grammatical complexity and vocabulary load. However, during the think-aloud process, she displayed active emotional responses and cognitive involvement in reading this text although she encountered many comprehension hurdles caused by unknown words or sentences. Her interest and enjoyment from reading could be observed from her strategy choices illustrated in Figure 4.5.

Figure 4.5. Illustration of Interactions between the Original Text and Strategy Use by a Low-achieving L2 Reader with High Reading Interest

Quotes from the excerpts

"People in a hot place like to eat chocolate."

"I think it is yuckie! I don't like sweet chocolate."

"I like this kind of chocolate better."

"Really? Can it really increase attention?"

"I think they are indeed different. I think white chocolate tastes greasier."

"That's why many people are fat. Because they eat the wrong chocolate."

Situation model

Drawing inferences

Determine

Evaluating text content

Evaluating text content
"

Clarifying the information in text

Evaluating text content

Drawing inferences

Textbase

Determine meaning of a word

Determine meaning of a sentence

Determine meaning of a sentence

Word-by-word translation

Word-by-word translation

Paraphrasing

Word-by-word translation

Paraphrasing

Word-by-word translation

Text

"The word, chocolate comes from *chocolatl.* This is a Spanish word, meaning "hot water.""

"Much of the chocolate we eat is sweet chocolate."

"Dark chocolate is the best kind of chocolate…
Caffeine can help us have good feeling, such as happiness or attentiveness.""

"White chocolate is different from dark chocolate…Eating white chocolate can not make us feel happy as eating dark chocolate."

Alice's interest in performing this reading task is manifested by her constant use of evaluation strategy to actively respond to the text content. From Figure 4.4, it could be seen that she frequently expressed her own opinions, attitude or prior experiences right after she comprehended the information mentioned in the text through translations. For example, when reading that most of chocolate is sweet chocolate, she immediately responded," I think it is yuckie! I don't like sweet chocolate". As reading the sentence describing a higher proportion of cocoa in dark chocolate, she agreed, "I like this kind of chocolate better". In reaction to the comparison between white chocolate and dark chocolate, she stated, "I think they are indeed different. I think white chocolate tastes greasier". These utterances resemble a continuous, interactive dialogue between her and the author, where she freely shared her own ideas or personal experiences related to chocolate, and sometimes even argued with the author.

In addition, I also observed that during the think-aloud, she tended to use a more causal and personal tone to explicate her thoughts and opinions about this expository text. She also focused more on how her own experiences were related to the text, instead of analyzing the gist or identifying the targeted scientific knowledge in the text. In a word, Alice's reading approach gives a glimpse of one aspect of L2 reading, which is the more emotionally-charged, "hot" interaction between the reader and the text (Pintrich et al., 1993).

Despite her active responses and evaluations to the text content, Alice still used the strategies at the superficial level in a more cursory or intuitive manner. Namely, she demonstrated attempts to carry out certain situational model construction strategies, such as drawing inferences, content evaluations or clarifications during reading. However, she did not fully cultivate these strategic processes adequately and sophisticatedly enough to facilitate comprehension of the text. In her use of the

evaluation strategy, most of her utterances were straightforward statements based on her own experiences or personal opinions without referring to how these evaluative comments could be connected to the information in the text in more depth. To draw inferences or clarify unclear content, she just raised the questions without further examining the quality of her inferences or exploring possible answers from the text. Consequently, she did not receive high scores on the measurements of quality of her total strategy use.

Moreover, Alice did not use other situation model strategies (e.g. summarization or elaborations) that would have helped her build a more complete mental representation about the text. Instead, the repeated use of the evaluation strategy might signal the dearth in her strategy repertoire and insufficient practices of strategy use from her prior reading experiences. The effects of the limited and superficial use of the strategies were, therefore, reflected in her reading comprehension. Below is the excerpt of the text recall produced by Alice. The excerpt shows that she could construct basic main ideas in the text, but these ideas are rather general and missed more specific information that is original in this text. This outcome implies that emotional engagement alone without elaborated use of strategies is still insufficient to generate successful comprehension.

> *Alice*:
>
> 巧克力有甜的還有苦的。甜的，苦的會讓我們很開心，會有專注的感覺，然後不好的巧克力會讓我們變胖。(Some chocolate are sweet and some are bitter. The bitter one will make us happy, and more focused. And the bad chocolate will make us fat.)

Regarding Alice's interest perceptions about this text, she showed a high level of topic interest despite of the linguistic difficulty of the text. In the retrospective review, she regarded that this text "would be more interesting if I could understand more of it". In accordance with the previous analysis, difficulty in comprehension is a major element that inhibits L2 readers' interest, especially for the low-achieving students. However, she still considered this text to be interesting because of her personal craving for chocolate. She stated that "I like the second paragraph because it talks about dark chocolate, which I like a lot… I don't like the last paragraph because it says something about fat and chocolate. This will make me feel bad next time when I buy chocolate". Apparently, Alice's personal preference for this topic becomes the significant source that influences the situational interest in this task. The rise of reading interest in the topic might in turn help her overcome the frustration caused by the comprehension difficulties.

In addition, I also learned that Alice has strong language learning motivation for English. She indicated that English is her favorite subject. One of the reasons for her high interest in English might be related to her family background as she mentioned, "Because our family is running a company with many foreign clients, but my mom and my brother could not use English very well". The fact that learning English could greatly help her family's business enables Alice to become more aware of the importance of English than other students, which also helps her form a better learning attitude toward English.

To conclude, the qualitative analysis of Alice's case implies that L2 reading interest in a current reading task is a complex construct that has multiple interest sources at different levels. The most direct influences are from the characteristics of the text and the immediate reading context. While many indirect effects related to

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individual differences, such as readers' personal topic preferences, language learning

motivation and socio-cultural backgrounds could also play implicit and significant

roles during the reading process. In the case of Alice, she is clearly a

highly-motivated L2 learner who demonstrates spontaneous interactions with the text

in a more emotional way. Aside from the necessity to improve her language

proficiency, she also needs external support to buttress her strategic knowledge and

processing skills. An explicit reading strategy instruction could greatly help her

expand the strategy repertoire and provide her with more opportunities for practice

and refinement of the use of strategies. Based on her impressive reading interest, I

believe that she might be a promising reader who could gain extraordinary progress

after a strategy instruction.

Stella, a L2 reader who has high English achievements, low reading interest and uses

strategies at a superficial level

Stella's profile on language proficiency, strategy use, and reading interest

presents a sharp contrast with that of Alice. She is regarded as a high-achieving

student who has outstanding academic performance in almost all school subjects and

English is no exception. However, when asked to complete this think-aloud task, she

did not appear to be enthusiastic during the whole process. From her strategy use

analysis, as portrayed in Figure 4.6, it is found that she was not very involved in

processing this text cognitively and emotionally, and used the strategies more at the

superficial level.

Figure 4.6. Illustration of Strategy Use Sequence by a High-achieving L2 Reader who Has Low Reading Interest

Quotes from the excerpts

"Hot tea? It's strange."

"I am thinking about deoxidants. We are learning it now."

"It seems that the white has less..No, the white has more.. than the dark. Eating dark chocolate will have less problems"

"Chocolate is the same as candy. Don't eat them too much."

"Here it says that it has a lot of calories. Don't eat too much. You will become fat."

Situation model

Monitoring comprehension coherence

Determine meaning

Elaborating on text content

Determine

Drawing inferences Drawing

Drawing inferences Determine

Summarizing

Determine meaning of a sentence

Determine meaning of a word

Determine meaning of a sentence

Determine meaning of a sentence

Determine meaning of a word

Textbase

Paraphrasing

Paraphrasing

Word-by-word translation

Word-by-word translation

Word-by-word translation

Text

"The word, chocolate comes from *chocolatl*. This is a Spanish word, meaning "hot water."

"Cocoa has a lot of antioxidants."

"Cocoa butter has very little caffeine…Eating white chocolate can not make us feel happy as eating dark chocolate.."

"There are some bad things about chocolate…30 calories is the same as a chocolate candy kiss."

One of the specific patterns I notice from Stella's verbal report is that most of her utterances are direct translations or paraphrases, and the other remarks classified as the use of situation model construction strategies are generally short and simple. This strategy profile indicates that although she experienced fewer difficulties in translating and could build up the textbase more successfully, she seemed to have little intention and devote less effort to elaborate on the textbase for a more sophisticated situation model.

For example, when she monitored a comprehension problem during reading, she simply indicated the confusing point but did not try to clarify the problem or search for possible explanations. In addition, she drew several inferences for certain paragraphs, such as comparing the benefits between white chocolate and dark chocolate. However, the inferences she made were usually confined to linking the pieces of the information within the text. She seldom drew additional connections to bridge the information in the text with her prior knowledge and elaborate the literal understandings of the text. Therefore, she receives a relatively low score on the strategy quality assessment, implying that the strategies she employed generally remained at the surface level.

Another characteristic of her strategic process is the use of a more analytic approach for reading, which, in my view, focuses more on gaining academic knowledge from a text. Unlike Alice, Stella rarely expressed personal attitudes, opinions or feelings to the text in a more emotional way. Most of her statements centered on sorting out the concepts or the relationships between different information described in the text. The only additional knowledge she mentioned was how the chemical in chocolate, antioxidants, reminded her of deoxidants, which was what she

was learning from her science classes. This utterance thus insinuates her orientation to search for knowledge that is academically worthwhile in a text.

In addition to the more academic-oriented approach in reading this text, her tone during the think-aloud process was more impersonal. It seems to me that she positioned herself at a distance from the text as opposed to actively engaging in communicating with the text. This indifference serves as a sign of her low reading interest and flagging mental effort in comprehending this text, which could be further observed from her rather plain and short recall of the text:

> *Stella*:
>
> 大部分都在跟熱量有關吧，不然就在提白巧克力跟黑巧克力的成分。不知道，忘了。(Most of the text is about calories. Otherwise it is talking about the ingredients in white chocolate and dark chocolate. I don't know. I forgot).

Stella's meager reading interest is also confirmed in her retrospective interview. She clearly indicated that she did not enjoy reading this text and paid little attention because "I only concentrate when I am taking a test. If it is not a test, I won't take it too seriously. If I pay attention in a test, I could get good scores. This is not a test. I won't get scores on it, so I just scrambled through it". This statement points out an intertwined relationship among reading purposes, reading interest and strategy use. Stella is obviously a test-oriented student who tends to make cognitive efforts for a reading task that could give her external rewards or have high-stake impacts, such as a school examination. Since the current reading-aloud task was not related to her

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academic achievements at all, she simply did not intend to engage in comprehension and treated it like an obligation to fulfill.

There is a potential concern regarding Stella's strategy use tendency associated with this "reading for tests" approach. In the interview, Stella mentioned that her common reading strategy in L2 reading is searching for answers to reading comprehension questions from the text. "I often read the questions first and then go back to look for the answers in the text". This kind of test-taking reading strategy is not uncommon for EFL students (Rupp, Fern & Choi, 2007; Cohen & Upton, 2007). However, when situated in a non-test, normal reading context, the learners seem not be able to generate adequate reading interest and engage strategically to construct meaningful comprehension due to the overly practices of the test-taking reading strategy with a rigid test-oriented motivation. The case of Stella illustrates why a high-achieving reader with sufficient language proficiency might still experience difficulty with comprehension. This result raises cautions about the fundamental contextual effects on learners' reading interest, strategy use and reading outcomes.

Summary

This part reports three sets of qualitative analyses to answer the research questions. The first part describes12 strategies identified from the 36 readers' verbal protocols. These strategies pertain to three broad strategy categories: textbase comprehension strategy use, situation model construction strategy use and metacognitive strategy use. The textbase comprehension strategies are related to the ways in which readers translate the English sentences into Chinese and how readers determine meanings of unknown words or sentences based on contextual clues. The six situation model construction strategies are associated with the processes when L2

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readers construct meanings beyond literal comprehension, such as elaborating on the text, clarifying unclear information, summarizing across sentences, evaluating text content and drawing causal inferences to generate learning. As for the metacognitive aspect, two metacognitive strategies are identified: "monitoring the comprehension coherence or difficulty level" and "planning on executing solutions to solve problems".

The second part of this chapter offers the findings on the sources of reading interest from the readers' retrospective interviews. A total of eight sources that could influence reading interest are reported. Six of them are positive sources to increase the readers' situational interest: "novelty", "importance", "relevance", "topic preference", "correspondence to prior knowledge" and "personal interest in English". These sources are more related to the characteristics of the text content. The other two sources, comprehensibility of the text and whether readers like the text genre, are found to have negative impacts on interest perceptions.

The last section examines three learners' profiles on language proficiency, reading strategy use, reading interest and comprehension of the current text. These three learners are selected to represent three different types of L2 readers. The first learner, Mark, represents a high-achieving L2 reader with high reading interest who uses reading strategies more sophisticatedly. Because of his strong interest in English substantive use of strategies and active emotional engagement during reading, Mark produced a rather comprehensive text recall of the text.

The second learner, Alice, represents a low-achieving L2 reader with high reading interest in the text and the English language but uses the strategies at the superficial level. Alice demonstrated positive emotional engagement in reading,

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giving continuous evaluations and personal thoughts to interact with the text messages. However, she did not have adequate language knowledge and experienced difficulties in decoding words and understanding the meanings. Also, constrained by her limited strategic knowledge, she did not use too many higher-order strategies to help her construct a situation model of the text other than the evaluation strategy. Thus, she generated a text recall which was superficial and incomplete.

The third learner, Stella, is taken as an example of a high-achieving L2 reader who expresses low reading interest in the task and has superficial use of reading strategies. With strong language proficiency, Stella experienced fewer obstacles in understanding the literal meanings of the sentences. However, she appeared not interested in reading this text, and did not try to go beyond the textbase to elaborate the situation model. Most of her strategies were executed at the surface level without too much effort and deliberation. Hence, her recall of the text was of low quality, showing a strong influence from reading interest on learners' strategic processes and outcomes. These analyses of the distinct cases elucidated the complex dynamic between cognitive processes and emotional engagement.

CHAPTER FIVE: DISCUSSIONS AND IMPLICATIONS

Introduction

This final chapter starts by reviewing the results from the qualitative and quantitative analyses in the previous chapter. A general discussion will follow on the four thematic findings containing the integration of the results from the two sets of analyses. Relevant implications for researching on L2 reading and teaching English reading in the EFL context are also provided. The last part concludes the significance of this study.

Review of the Qualitative Results and Quantitative Results

In this section, the qualitative results and quantitative results in accordance with each research question are reviewed. To present a broad picture about how the qualitative and quantitative data complement or contrast each other in answering the research questions, the results are listed in Table 5.1 where the qualitative results (QUAL) and the quantitative results (QUAN) are placed side by side for clearer comparison.

Table 5.1 shows that the qualitative analysis and quantitative analysis have produced corresponding or complementary results that could help strengthen the validity of the inferences drawn to address the research questions. In the following sections, I will integrate these results and offer a synthesized discussion on the emerging themes based on the findings.

Table 5.1. *Summary of the Qualitative and Quantitative Results for the Three Research Questions*

Research Question 1

Research Question 1.1: What are the L2 reading strategies employed by
      eighth-graders identified from a self-report assessment and
      think-aloud protocols?

QUAL	QUAN
From the think-aloud protocols, twelve reading strategies were analyzed: 1.Word-by-word translation 2.Paraphrasing 3.Determining an unknown word's meaning by using contextual cues 4.Determining the meaning of a sentence by using contextual cues 5. Elaborating on the text 6. Summarizing across sentences 7. Evaluating text content 8. Drawing causal inferences from text sentences 9. Clarifying the information in the text 10. Making forward inferences 11.Monitoring the comprehension coherence 12. Planning on executing solutions to solve problems	From the strategy questionnaire, *Cognitive-Metacognitive Strategy Questionnaire* (*CMSQ),* the exploratory factor analysis identified seven strategy factors: 1. Text comprehension strategies 2. Elaboration strategies 3. Coherence monitoring strategies 4. Planning strategies 5. Time monitoring strategies 6. Predicting strategy 7. Goal-setting strategy

Research Question 1.2: How do the results from different assessments
      correspond to each other?

QUAL	QUAN
The think-aloud protocols were analyzed to develop detailed descriptions	In addition to the *CMSQ*, three scoring procedures were

for the rubrics of one point and two points in the quality scale for strategy use to measure the degree of sophistication and effort when readers execute the strategies.	adopted to quantify the readers' strategy use from the think-aloud protocols, so there were four strategy measures in total
	1.Total score of the *CMSQ*
	2. *Quantity of total strategy use*
	3. *Quality of total strategy use*
	4. *Sophistication of Strategy Use*
	    Pearson correlation analyses on the four strategy measures show that the self-report measure, the *CMSQ* has low correspondence to the three strategy measures from the think-aloud protocols.
	    Among the four strategy measures, *Sophistication of Strategy Use* has the highest correlations with other strategy measures as well as readers' English proficiency scores.

Research Question 2: What are the sources of interest in L2 reading for

eighth graders and how do the sources of interest relate to readers'

perceived interest

QUAL	QUAN
From the retrospective interviews of the L2 readers, eight elements were classified as the sources for reading interest: 1. Novelty 2.Importance	The exploratory factor analysis on the Situational Interest Questionnaire *(SIQ)* identified two latent variables related to the sources of interest:

3. Relevance	1. Engagingness
4. Topic preference	2. Familiarity and comprehensibility
5. Correspondence to prior knowledge	The exploratory factor analysis
6. Personal interest in English	on the Interest Experiences Scale
7. Comprehensibility of the text	(IES) identified three latent
8. Text genre	variables related to perceived
The elements reported to have positive influence to increase situational interest are more related to the characteristics of the text content, such as "novelty", "importance", "relevance", "topic preference", and "correspondence to prior knowledge".	interest: 1.Feelings of interest 2.Feelings of concentration 3.Feelings of control
The elements reported to have negative influences on situational interest are more related to the linguistic difficulty of the text, such as "comprehensibility of the text" and "text genre".	Low to moderate correlations are found among the latent variables of situational interest and perceived interest. The multiple regression analysis shows that the variable, engagingness of the content, has a stronger contribution to readers' interest experiences than the familiarity and comprehensibility of the text.

Research Question 3: How do L2 reading strategy use, sources of

     situational interest and perceived interest relate to L2 reading

     comprehension?

QUAL	QUAN
Three reader are selected to represent three dissimilar L2 learner groups based on their distinctive differences in language	The results of multiple regressions with the readers' text recalls as the dependent variable

proficiency, L2 reading strategy use, reading interest and reading comprehension:

1. The first reader represents a L2 learner who has high English achievement performance, strong reading interest in the task and employs reading strategies flexibility and actively to achieve comprehension.

2. The second reader represents a L2 learner who is low in English proficiency and limited in using adequate strategies sophisticatedly, but has strong reading interest and language learning motivation.

3. The third reader represents a L2 learner who is more proficient in English but demonstrates low reading interest and superficial use of reading strategies.

show that reading strategy use, situational interest and perceived interest all have significant effects on L2 reading comprehension.

The results of hierarchical regressions to predict L2 reading comprehension with language proficiency, reading strategy use and reading interest show that the effects of the two reading interest constructs, situational interest and perceived interest, disappear when the contribution of reading strategy use is accounted for.

Discussion of the Major Findings

This study uncovered a complex dynamic of L2 reading comprehension, where reading strategy use and reading interest both played unique roles. In this section, the major findings will be discussed with respect to four themes. The first theme addresses the methodological issues in assessing strategies. The second theme explicates the import features of strategic processes during L2 reading comprehension. The third theme focuses on the complicated nature of L2 reading interest. Finally, the fourth theme emphasizes how reading strategy use and reading interest interact with each other as well as with other contextual factors to influence L2 reading

comprehension.

<u>Which is the "Better" Strategy Assessment? Self-report Questionnaires vs.</u>

<u>Think-alouds</u>

One major purpose of this study is to conduct a multi-method assessment of strategy use and examine the degree of correspondence between different assessment methods. Two specific instruments and procedures were used to investigate reading strategies in this study, a self-report strategy questionnaire and think-aloud protocols. These two methods were commonly used in previous L2 studies to assess reading strategy use, but they have rarely been included in one single study to assess the same participants. Hence, how well the results from these two strategy assessments complement each other remains unclear.

According to Veenman (2005; Veenman et al., 2003), thinking-aloud is an on-line, process measure with which readers are instructed to verbalize their ongoing thoughts and mental actions in working memory during the course of reading. In addition, it is not a self-reported instrument because the collected verbal data is analyzed by researchers based on an intended research focus grounded in a specific theoretical framework. On the other hand, strategy questionnaires are off-line, retrospective self-report measures. Readers are asked to retrieve the memory about their reading activities for a particular task or general reading behaviors using a variety of strategy items as prompts to activate such memory traces in short term or long term memory (Cohen, 1998; Razavi, 2001; Desoete, 2008; Veenman, 2005) .

In the current study, I used the *Cognitive-Metacognitive Strategy Questionnaire* (*CMSQ*) by Phakiti (2003, 2008), which lists 14 cognitive strategies and 13 metacognitive strategies for L2 reading. For the think-aloud protocols, I quantified the

verbal data through three scoring procedures and developed three strategy measures. The first measure is *Quantity of Total Strategy Use* based on the total number of frequency counts across the 12 reading strategies I categorized from the verbal data. This measure is also a common practice to quantify think-aloud protocols used in L2 research (e.g., Jimenez ; 1995; Jimenez et al., 1996; Anderson, 1991). The second measure is *Quality of Total Strategy Use* based on the sum of quality points aggregated from the 12 reading strategy categories. This measure has been recommended and frequently applied in the series of studies by Veenman and his colleagues (e.g., Veenman et al., 2006; Veenman & Beishuizen, 2004) on L1 reading or general learning processes. The last measure is a unique innovation in this study, named as "*Sophistication of Strategy Use*". This measure is obtained by dividing the score of *Quality of Total Strategy Use* by the score of *Quantity of Strategy Use*. The value from this scoring procedure represents the average degree of sophistication and effort that the readers devoted in executing the strategies.

The correlation analysis with the four strategy measures shows that there are low to even no correlations between the strategy questionnaire and the three strategy measures from the think-aloud data. The strategy questionnaire does not correlate with *Quantity of Total Strategy*, and only has weak relationships with *Quality of Total Strategy Use* and *Sophistication of Strategy Use*, indicating a generally low correspondence between these two strategy instruments. This result echoes findings from previous studies (e.g., Veenman et al., 2003; Cromley et al., 2006), where the researchers found a discrepancy between the results collected from self-report questionnaires and think-aloud protocols and raised concerns about using self-report questionnaires as the sole instrument to assess strategy use.

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Regarding the incongruent results between the strategy questionnaire and the think-alouds in this study, I examine this result by two aspects. This first aspect focuses on the methodological constrains of these two instruments. The second aspect discusses the measurement validity of these strategy measures to identify the better assessment.

First, self-report strategy questionnaires have several inherent limitations in reliably capturing learners' psychological processes. Memory loss or distortion due to the time lag between the actual performance and the assessment time point is a significant cause that could undermine the accuracy of readers' self reports (Razavi, 2001; Desoete, 2008). In addition, social desirable response bias is also a possible threat that weakens the validity of questionnaires (Cohen & Scott, 1996). Since the strategy items in the questionnaire usually appear to be the desirable learning behaviors expected for a good learner, it is possible that the learners are inclined to provide positive responses on these items. Moreover, considering the relatively young age of the readers in this study, their ability to reliably recall and report what they have done in completing the task might be more uncertain than adult respondents.

On the other hand, think-aloud protocols are probably not a full-fledged strategy assessment, either. They also have methodological limitations that need to be taken into consideration. One of the key constraints discussed extensively in previous literature is the completeness, accuracy and comprehensiveness of report of learners' ongoing mental processes (Alavi, 2005; Pressley & Afflerbach, 1995; Cohen, 1996; Schellings et al., 2006). Several factors that could influence the completeness of think-aloud verbal reports have been mentioned. For example, readers' verbal skills can affect their capability to clearly articulate the steam of mental actions. In addition,

some inner thoughts might be just too complex to be described verbally. Hence, verbal reports could only capture the thoughts that could be put into words and are unable to tap into abstract mental operations in depth.

Moreover, the nature of the task and learners' ability to perform the task are also other noteworthy factors. A cognitive-demanding task could require learners' full attention and overtax work memory so that they have no spare cognitive source to report what they are thinking. By contrast, if a task is too easy or proficient learners could perform the task with ease, it is possible that not too many thoughts are present in work memory or the thoughts flee quickly to escape the learners' awareness. These limitations might inevitably impair the degree of adequacy of the verbal data through think-alouds.

Taken together, it seems that the strengths of one strategy instrument actually compensate for the weaknesses of the other. The questionnaire items might hint the readers to recall the mental operations that are too implicit or too abstract for verbalization. The think-aloud data provides in-depth examination of the most distinct thoughts the readers are attending to. Therefore, the fact that each instrument has its unique advantages might partially explain their low correspondence with each other.

Second, despite the possible methodological constrains of these two strategy assessments described above, it is still of significant value to inspect that among the four strategy measures, which one is more able to tap into the underlying construct the assessment purports to measure. The veridicality of these strategy measures could be examined by three types of measurement validity (Cronbach & Meehl, 1955; Oxford, 2011): concurrent validity, convergent validity and predictive validity.

The first type is concurrent validity. This refers to whether the instrument

correlates well with other instruments measuring the same construct or concepts. The correlations among the four strategy measures show that the measure, *Sophistication of Strategy Use*, has the highest correlations with the other three measures. It has moderate correlations with the *CMSQ* and *Quantity of Total Strategy Use*, and has a very high correlation with *Quality of Total Strategy Use.*

The second type of measurement validity is convergent validity. This is defined as the correspondence between the instrument and other instruments which measure theoretically-related or similar construct or concepts (Cronbach & Meehl, 1955; Oxford, 2011). Since language strategy use has been proven to have strong connections with learners' language proficiency (e.g., Oxford, 1990; O'Malley& Chamot, 1990; Cohen, 1998; Chung, 2007; Cohen & Macaro, 2009), the study analyzed the correlations between the four strategy measures and the readers' language proficiency to check their convergent validity. It is found that *Sophistication of Strategy Use* has the highest correlations with the readers' English academic achievement and the *TOEIC reading comprehension test,* while the *CMSQ* does not correlate with any of the language proficiency measures.

The third type of measurement validity is predictive validity, referring to the extent to which the instrument could successfully predict the results on other instruments that are theoretically relevant to the current instrument (Oxford, 2011). The predictive validity of these strategy measures could be inspected through their correlations with the comprehension outcomes of the text. Again, the results show that *Sophistication of Strategy Use* has the highest correlation with the text retelling scores and *Quantity of Total Strategy Use* and the *CMSQ* yield lower correlations.

To conclude, the novel strategy measure created by the present study,

Sophistication of Strategy Use, is shown to have the most considerable validity compared with other three measures. This measure reflects the degree to which the L2 readers complete a strategic process with thoughtful effort and is obtained from the instrument of think-alouds. By contrast, the strategy questionnaire yields relatively lower validity than the other strategy measures derived from the think-aloud method. Therefore, it is inferred that for this reading task where the readers were instructed to read along and try to comprehend the text meaning, the method of think-alouds seems to generate more reliable and valid data than a strategy questionnaire. However, this conclusion might not be generalizable to other types of reading tasks in a different context. This conclusion might be also tentative because of the methodological limitations of verbal protocols. More studies are needed to further examine the viability of verbal data and to develop refined definitions followed by a detailed rating scale to evaluate the quality of reading strategy use.

Strategic Processing in L2 Reading Comprehension

With a multi-method design, the study identified L2 reading strategies from the think-aloud protocols and 7 strategy factors from the *CMSQ*. For the reading strategy use in the think-aloud data, these 12 strategic processes could be further categorized into three dimensions: textbase comprehension, situation model construction and metacognitive monitoring. These dimensions align with the text comprehension theory, Construciton-Integration Model (van Dijk & Kintsch, 1983) and the theories on the importance of metacognitive monitoring in reading (e.g., Mokhtari & Reichard, 2002; Palincsar & Brown, 1984; Baker & Brown, 1984).

As for the strategy use measured from the *CMSQ*, the strategy items did not cluster together by these three distinctive theoretical aspects. Rather, each strategy

factor was characterized by a specific reading purpose related to text comprehension or comprehension monitoring, such as textbase understanding, time monitoring or planning. Most of the strategy factors comprise some textbase strategy items, some situation model construction items and some metacognitive monitoring items together, showing how L2 readers use different kinds of strategies to achieve their intended purposes strategically.

Integrating the results on L2 reading strategy use from the qualitative data and quantitative data, I would like to discuss three specific points based on the analyses. The first point centers on the similarities and differences between L1 reading strategy use and L2 reading strategy use. Broadly speaking, the types of L2 reading strategy identified in my study are actually very similar with most of the L1 reading strategies in previous literature. For example, Dole et al. (1991) summarize five general categories of L1 comprehension strategies: (1) determining importance, (2) summarizing information, (3) drawing inferences, (4), generating questions, and (5) comprehension monitoring. In the think-aloud data of this study, I found that the L2 readers also used these strategies frequently and deliberately.

Moreover, the 12 strategies identified in this study also fit well into the three broad clusters on L1 reading strategies in Pressely and Afflerbach (1995), which are (1) identifying and learning text content, (2) monitoring and (3) evaluation. In this study, the textbase comprehension strategies and several situation model construction strategies, such as summarization, elaborations, drawing inferences, clarifying information and predictions, could fall into the first cluster," identifying and learning text content". The metacognitive strategies are associated with the cluster, "monitoring". One strategy about evaluating text content was also identified in the

readers' verbal data that could be classified into the cluster," evaluation", in Pressely and Afflerbach (1995). Hence, it seems that above the level of decoding linguistic input in a text , L1 and L2 reading share many similar cognitive processes and require the same high-order thinking skills for meaning construction and active learning from text content to happen.

The major difference between L1 reading and L2 reading lies in the need for L2 readers to translate L2 input into L1 meanings first for further processing. Translating is described as a process where L2 learners take advantage of their native language and make effective cross-lingual comparisons (Liao, 2006). In this study, translation strategies were frequently applied by both proficient L2 readers and less proficient L2 readers.

The basic translation strategy is word-by-word translation, where the readers tried to search for translation equivalents in Chinese for each English word in the sentences. This strategy can help readers generate "raw" understanding about an L2 sentence. However, sometimes the combination of the translation equivalents did not add up to a meaningful idea due to the differences in the grammatical structures between English and Chinese. According to my observation, the more proficient L2 learners tended to translate a sentence by focusing on several keywords and paraphrasing the overall meanings using more familiar or colloquial words, instead of providing common Chinese translation equivalents for those English vocabulary. This result is similar with previous studies (e.g., Chuang, 2007; Jimenez, 1995; Jimenez et al., 1996).

According to Hummel (1995), translating through paraphrasing, in effect, resembles an elaborative process, which requires conceptual processing to connect

new information with prior knowledge or make personal associations with the new information. Through these processes, L2 readers construct a more refined mental representation of the text that could facilitate meaningful comprehension more easily. One thing to note is that these mental processes might be too implicit for verbalization, so the think-aloud method could only collect the paraphrases as the translation products after these elaborative processes.

The second discussion point draws attention to the effectiveness of specific sequences of strategy use in L2 reading comprehension. From the qualitative analysis of the three learners' strategy use profiles, especially of the high-achieving readers, a repeated sequence of L2 reading strategy use was revealed. This strategy chain usually occurred across several sentences centering on a core idea. The sequence began with more textbase comprehension strategies at the beginning of reading, such as translating through paraphrasing or determining word meanings and sentence meanings by using the contextual cues. As the readers moved forward across two or three sentences, some situation model construction strategies were initiated, including evaluating the content, summarization, drawing inferences and elaborations. These strategies were used to integrate the meanings from different parts of the sentences into one coherent but tentative representation about the text for later processing. This specific pattern might be repeated for the next several sentences. I also observed that for the readers who scored high on the text retellings, this pattern was present more frequently in their verbal reports, implying that the frequency of certain strategy use sequence might have potential influences on reading comprehension.

In addition, this study also recognizes the importance of conditional knowledge about strategy use in reading. Conditional knowledge refers to knowing when, why

and where to use certain strategies (e.g., Paris et al., 1984), and is often regarded as one crucial component of metacognitive knowledge (Oxford, 2011; Wenden, 1998). In the verbal report of the selected high-achieving reader, Mark, he was shown to use more textbase comprehension strategies at the beginning of the text. He only started to elaborate, evaluate and summarize the text messages when reading the later part of the text. This pattern well facilitated his comprehension as it prevented him from overextending the literal meanings at the inception of reading, and allowed him to construct an elaborated as well as detailed situation model based on the original text.

Thirdly, the exceptional effects from sophisticated use of reading strategies on reading comprehension are worth noting. The study found that the measure, *Sophistication of Strategy Use*, had a stronger relationship with L2 reading comprehension and reading interest than the other three strategy measures. Looking closely, it could be seen that among the four strategy measures, the three scoring methods, the *CMSQ*, *Quantity of Total Strategy Use* and *Quality of Total Strategy Use*, are more or less related to how many strategies are reported or observed. The total score from the *CMSQ* represents both the quantity and frequency of total strategy use. *Quantity of Total Strategy Use* is a sum of the frequency counts across the 12 strategy categories and *Quality of Total Strategy Use* is obtained by summing over the quality points across the 12 strategy categories.

By contrast, *Sophistication of Strategy Use* is independent of the total amount of strategies used by the readers. Instead, it evaluates on average, how deep the readers were engaged with the strategic processes during reading. According to the findings, the depth of strategic processing appears to be more powerful than the quantity of strategy use to support a successful reading. In other words, it might be more

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important for readers to process every strategy thoroughly with extensive effort than to employ a variety of different strategies but in a cursory manner with little attention.

It should be mentioned that the concept, sophistication of strategy use, in this study describes the importance of the depth of strategic processing, and it is different from the term, deep processing strategies, in previous research (Oxford, 2011; Alexander, 1997; 2003). Deep processing strategies refer to the specific strategies that are more facilitative for meaningful understanding and long-term retention of information, which involves " …delving into the text, as when readers judge author credibility or form mental representations" (Alexander, 2003, p11). Deep processing strategies are assumed to be more conducive for reading than surface strategies. In my view, deep processing strategies are similar with the situation model construction strategies defined in this study.

In contrast, sophistication of strategy use does not concern the types of strategies. Rather, it focuses more on how sophisticatedly or thoroughly readers could set up a goal and carry out a working plan during *every* strategy use, including identifying why the particular strategy is needed, recognizing available resources, executing the actions, monitoring the process, evaluating and revising the outcomes. Based on the finding that the sophistication of strategy use has a remarkable effect on reading comprehension, I argue that aside from increasing students' knowledge about higher-order, deep-level strategies, how to process these strategies carefully and effectively should also be highly emphasized.

L2 Reading Interest as a Complex Construct

The third theme addresses the possible sources for L2 reading interest. In this study, the construct of L2 reading interest has two components: situational interest and

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perceived interest. According to the qualitative analysis, eight interest sources for situational interest were reported by the 36 eighth-graders. These sources together present a complex picture on how textual characteristics and individual differences affect L2 reading interest. The two major points are discussed below.

First, the results show that the characteristics of the content in the L2 text seem to play a more central role than the L2 readers' language proficiency in inducing situational interest. Six of the interest sources are related to readers' judgments on various features of the text content, including novelty, relevance, importance and familiarity of the information in the text. In addition, whether L2 readers personally prefer the text topic or the genre of the text are the other two sources related to textual characteristics.

The quantitative results also provide supportive evidence for the effects from textual characteristics on situational interest. It is found that the text that contains engaging ideas is the most significant variable to tap into the construct of situational interest. As for readers' perceived interest, the results shows that the factor, "feelings of interest", constitutes the more salient dimension for perceived interest than "feelings of control". The former dimension is relevant to readers' evaluation of the text content, while the latter dimension is usually associated with readers' English proficiency. This finding indicates a more salient influence from the textual characteristics on the readers' interest experiences.

Taken together, it seems to imply that L2 learners obtain greater satisfaction and enjoyment from reading an interesting text than reading an easy L2 text. Although linguistic difficulty does impose some challenges and inhibits interest, L2 readers still could feel interested and engaged if the L2 text conveys novel ideas which connect

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with their background knowledge. It is remarkable to observe the level of curiosity and engagement expressed by these young readers. Even when they experienced difficulties in decoding words or sentences, the interested readers could still take these hurdles lightly and focused on responding to the ideas in the English text. The findings hence call for more attention on how to select L2 reading materials or design language tasks that incorporate elements of interestingness.

Second, this study found that the readers' English learning motivation also affected their reading interest in the current text. Several readers mentioned that their like or dislike of English was the main reason for their interest or non-interest in this text. This source is less relevant to text characteristics and more concerned with learners' belief and attitude toward English as a school subject and as a functional language (e.g., Dörnyei, 2001; Oxford & Shearin, 1994).

Language learning motivation has been an intricate issue in this field and is beyond the scope of this study. However, this finding points out the inadequacy of the multicomponent model of L2 reading interest by Brantmeier (2006), which is based on L1 reading research and only involves textual characteristics (e.g., ease of comprehension, cohesion, vividness, emotiveness and prior knowledge). The construct of L2 reading interest might be more complex and is not limited only to reader-text interactions. The influences of the situated social context, readers' attitude toward the language, and the task design, including why they should read and how they are being assessed, could all come into play explicitly or implicitly to change learners' reading interest.

The Roles of Strategy Use and Reading Interest in L2 Reading Comprehension

The fourth thematic findings focus on the interactions between reading strategy

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use and reading interest and their effects on L2 reading comprehension. Three points related to this issue are discussed in more detail.

First, the quantitative analyses indicated that reading strategy use had a strong and independent contribution to L2 reading comprehension. The influence from reading strategy use remained significant after language proficiency and reading interest were accounted for. In other words, regardless of L2 readers' language knowledge and their interest in the English text, using reading strategies sophisticatedly alone could effectively enhance their comprehension of the text. This finding highlights the importance of strategy use for successful learning as has been delineated in previous literature across different fields(e.g., Oxford, 2011; O'Malley & Chamot, 1990; Alexander et al., 1998; Paris et al., 1983; Zimmerman, 1990; Winne & Hadwin, 1998).

Second, reading strategy use seems to play a mediating role between reading interest and reading comprehension. This inference is drawn based on the quantitative finding that the effect of reading interest on reading comprehension was significant but disappeared after the variance of reading strategy use was accounted for. Namely, the sophisticated use of reading strategies might also be a manifestation of L2 readers' interest in the text, so the variances of these two variables are confounded together.

This result implies that an interested reader tends to use strategies with more effort and engaged more with the reading process, which leads to better comprehension. In addition, it also suggests that possessing reading interest alone without using strategies is not sufficient enough to allow successful comprehension. From the qualitative analysis on the L2 learners' strategy use profiles, the low-achieving reader, Alice, showed strong reading interest in the text. However, due

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to the lack of strategic knowledge and practices in her previous learning experiences, she could only use strategies that were rather superficial and generated a less complete text recall. These evidences from different source of data support a prominent role of reading strategy use in L2 reading comprehension.

Third, reading interest is important in its influence on the use of deep processing strategies as well as the depth of strategic processing for L2 readers who are capable of performing these strategies. As described earlier, deep processing strategies refer to the types of strategies used to construct the situation model, such as summarizing, drawing inferences or evaluating, while depth of strategic processing concerns the level of involvement and effort that readers exert to execute the strategies. In the qualitative analysis on the learners' profiles, the high-achieving reader, Mark, appeared to be a strategic learner. With his keen interest in English and in this text, he applied several deep processing strategies to activate his prior knowledge, elaborate the textual meanings and enrich his understanding and interpretation about this text. In addition, he also demonstrated deep involvement in using these strategies.

On the contrary, the other high-achieving reader, Stella, contended that she was not interested in this task and did not feel a need to read it as carefully as in an English test in the retrospective interview. Stella actually represents a typical EFL student who tends to seek for academic value, such as grades or teachers' recognition, in an English task. Therefore, the absence of such value in the current think-aloud task might reduce her interest and willingness to get cognitively involved. In her verbal report, she used much fewer deep processing strategies and showed less effort in performing the strategies. Most of her strategies were rated low in terms of the level of sophistication. Stella's profile illustrates how contextual factors and reading interest

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could dramatically affect learners' use of strategies and depth of strategic processing. To conclude, the learners' profiles reveal implicit but strong interrelationship among the contextual factors, L2 learners' reading interest and reading strategy use.

Summary of Discussion

This section summarizes the four thematic findings based on the synthesis of quantitative and qualitative results. First, a discrepancy between the data collected from the strategy questionnaire, *CMSQ*, and the think-aloud protocols was found. Moreover, among the four strategy measures used in this study, *Sophistication of Strategy Use* was shown to have the most solid measurement validity to assess L2 reading strategy use than the *CMSQ*, *Quantity of Total Strategy Use* and *Quality of Total Strategy Use*. Hence, the scoring procedure of *Sophistication of Strategy Use* based on the data collected from think-aloud protocols was regarded as more appropriate to assess strategy use. However, it was emphasized that think-alouds was still limited in its adequacy to reflect a complete account of readers' mental operations.

Second, according to the results from the verbal reports and the *CMSQ*, the textbase comprehension processes in L2 reading included translating L1 to L2 and seek for meanings of words or sentences. Beyond the textbase level, the L2 readers used several strategies to construct situational models as in L1 reading. Metacognitive monitoring was also another important process involved in L2 reading. These findings indicated a similarity between L1 and L2 reading. Moreover, from the learners' verbal reports, specific sequences of strategy use patterns in L2 reading were noted. The strategy sequence composed of interactions between the textbase comprehension strategies and situational model construction strategies were present repeatedly in the

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verbal reports of the learners who produced more complete text recalls. The findings addressed the importance of conditional knowledge about when to use what type of strategies in accordance to the reading context or characteristics of the text.

Third, L2 reading interest was shown to be a complex construct that was influenced by not only the textual characteristics but also other individual factors and contextual factors. The retrospective interviews revealed that the readers judged the interestingness of the L2 text context by several aspects, including whether the information of the text was new or important for them to learn, how was the content relevant to their experiences and whether they had personal interest in the topics. In addition, the reading context, readers' language proficiency levels and attitude toward English were also discussed as possible sources for L2 reading interest.

Fourth, in terms of the roles of reading strategy use and reading interest in L2 reading comprehension, reading strategy use was found to have greater contributions to L2 reading comprehension than reading interest. Reading strategy use also mediated the effects of L2 reading interest on reading comprehension. In other words, an interested reader might still generate superficial understanding about a L2 text if he/she is not capable of employing sufficient strategies during reading. On the other hand, reading interest influenced what types of strategies the readers used and the depth of strategic processing. The more interested readers used more situational model construction strategies, and their strategy remarks were also more elaborated, and coherent, demonstrating a higher level of sophistication in the strategic processes.

Implications for Research

With a multi-method design, a complicated picture of how reading strategy use and reading interest affected comprehension of an English expository text for

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eighth-graders in an EFL context was presented in this study. Based on the findings, this section offers several implications for research on L2 reading or general reading comprehension.

Firstly, this study validated a unique scoring procedure to assess the sophistication of L2 readers' strategy use with data collected from think-aloud protocols. Hence, verbal protocols with the measure, *Sophistication of Strategy Use,* could be an ideal task-based instrument to evaluate the quality of learners' reading strategy use in a specific reading context. The advantage of this method is that verbal reports could be analyzed qualitatively first and then transformed into quantitative data through the specific scoring procedure to be compared or correlated with other measures. Moreover, aside from L2 reading comprehension, it could also be used to gauge strategy use in L1 reading processes or other problem-solving tasks.

However, think-aloud protocols are still constrained in their sufficiency to report the full range of readers' strategic processing. Hence, other data collection methods should be applied in combination with think-aloud protocols for the purpose of complementarity, or triangulation. Other possible strategy assessment techniques could be computer trace measures, video-taped observations, strategy checklists, interviews or learners' reflection journals (Oxford, 2011; Cohen, 1998). This mixed-method research design could highly enhance the methodological rigor in assessing strategy use.

Secondly, the study developed a strategy coding system for verbal data based on a theoretical framework integrating the text comprehension theory and theories on metacognitive monitoring. This strategy coding system includes three clusters of L2 reading strategies: textbase comprehension strategies, situation model construction

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strategies, and metacognitive strategies. This coding system could serve as a good coding matrix for researchers who are interested in identifying, categorizing and comparing reading strategies employed by learners for different reading tasks or in different contexts with verbal data.

Third, the study found an implicit relationship between L2 strategy use sequences and reading outcomes. Meijer et al. (2006) also encourage future research to study the correlations between patterns of sensible strategy sequences and performance results. Resonated with this suggestion, it would be of significance to look for strategy use chains that are conducive for L2 reading comprehension. Specifically, the characteristics of a certain strategy pattern, including the specific steps or strategies within the chain, and how the frequency of such chain influences L2 reading comprehension could be interesting topics for future research.

Fourth, this study probed into the sources of L2 reading interest and uncovered several important elements contributing to situational interest and perceived interest in a more exploratory manner. On the basis of these findings, future studies could examine the relative importance of each element in L2 reading interest in relation to different reading contexts or reading tasks, such as which of these sources become more prominent to influence reading interest when the reading task is a reading comprehension test in the test-taking context. Comparisons of how sources of reading interest change across different tasks or contexts could help shed light on the nature of L2 reading interest in terms of its fluidity and stability.

Lastly, investigating the cognitive processes and emotional processes together could provide more interpretative validity to explain the findings. Hence, it is encouraged to continue this research strand and focus on the interactions between

strategic use and readers' motivational engagement, instead of treating them separately. Due to the complexity of such interactions, employing a mixed-methods approach to analyze and present the collected data is highly recommended (Onwuegbuzie & Teddlie, 2002). This study used the statistical procedure, hierarchical regressions, to sort out unique influences of each variable on L2 reading comprehension. In addition to the quantitative analysis, the study applied case analyses on three readers' profiles, including their English achievements, graphic representations of their strategy use sequences from the verbal reports, retrospective interviews and questionnaire results. This qualitative approach offers in-depth interpretations about how and why L2 reading strategy use and reading interest are indispensible and interdependent in the comprehension process. Hence, the mixed method approaches to transform and analyze data might generate dissimilar findings, which could be further integrated for triangulation or comparison to present the complex dynamics in learning at a finely-grained size.

Implications for English Instruction in the EFL context

This study does not intend to provide mandates for educational practitioners and involves no instructional interventions. However, the findings still raise several pedagogical implications for teaching English reading in the EFL context. These implications will be introduced as follows.

Firstly, the results highly underscore the necessity of explicit L2 reading strategy training instruction for EFL students. In the readers' verbal reports, I notice a gap in the variety of strategies and depth of strategy use between the proficiency readers and less proficient readers. The low-achieving students seemed to use fewer strategies, and tended to process the strategies at the surface level. The shortage of students'

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strategic knowledge reflects the consequence of the traditional English instructional method in the EFL context, which puts exclusive emphasis on acquiring language knowledge, such as vocabulary or grammar.

Palincsar and Perry (1995) contend that learners cannot develop reading skills as naturally as walking, and strategies must be taught to students explicitly to aide their learning. In terms of reading an L2 text, not only L1 reading strategies are needed to solve comprehension problems at the conceptual level. Additional strategies are also required to help overcome linguistic difficulty. Hence, L2 reading strategy instruction should become a critical component in language instruction, especially for the learners' who are at the developmental stage of language learning.

Several strategy instruction models have been proposed and tested empirically. These include *Reciprocal Teaching Approach* (RTA, Palincsar & Brown, 1984), *Cognitive Academic Language Learning Approach* (CALLA, Chamot & O'Malley, 1994), *Styles-and Strategies- Based Instruction* (SSBI, Cohen, 1998), and *Strategy Awareness-Raising for Success* (STARS, Lee, 2007) in L2 learning. These models suggest some similar teachable steps to carry out strategy instruction:

1. Planning or preparation: At the beginning of teaching one specific strategy, teachers help activate students' prior knowledge about what they have known about this strategy and raise their awareness of why the strategy is important.

2. Presentation or modeling: With an example task, teachers verbally explain and demonstrate to students how to use the strategies effectively to facilitate completion of the task.

3. Practice: Students practice the strategies on their own and teachers provide guidance and feedbacks to support students' learning.

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4. Evaluation or reflection: Teachers encourage students to monitor the process of strategy use and evaluate whether the strategies could successfully improve learning outcomes for them.

5. Expansion or transfer: Students are reminded of applying the strategies to different contexts or different tasks and are given opportunities to work independently.

Among these steps, the present study emphasizes the practice phase and the evaluation phase in strategy instruction. The finding of this study indicates that the degree of sophistication in readers' strategy use is more associated with successful reading comprehension than quantity of total strategy use. Hence, it is inferred that students not only need to know what strategies are available, but also should learn how to self-regulate the process of performing a strategy, including identifying the problem space, constantly elaborating or making adjustments, and examining whether the outcome is adequate enough. To this end, students need sufficient practices to familiarize themselves with these sub-processes for a particular strategy. Moreover, the evaluation phase helps them monitor and remain aware of the continuous interactions between strategy use, their intended goals and the specific context. During these two phases, teachers work as facilitators, and gradually release the responsibilities to students and let them learn to take control over their reading.

Secondly, translation through paraphrasing is recommended as one useful instructional activity that could engage students into active and meaningful comprehension in L2 reading. In effect, in the EFL contexts, translating English texts into learners' native languages is a prevailing instructional focus as well as a common

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assessment technique influenced by the tradition of the grammar translation teaching method. In the case of Taiwan, teachers often lecture on how to translate English sentences word-for-word into Chinese and students are also given test items in Chinese or in English that require them to supply exact translations in the other language.

Instead of direct translation in a word-for-word manner, this study suggests that guiding students to paraphrase L2 sentences in L1 is considered more beneficial to help students transit from textbase understanding to meaning construction. Through paraphrasing, students could be allowed to use easier and more familiar words to describe the main ideas at the sentence level. Therefore, the students' attention would be directed to the conceptual level of the information, rather than to looking for correspondent linguistic forms for every English word. Current research on second language acquisition is still debating on whether translation from L2 into L1 should be encouraged at all (e.g., Liao, 2006; Hummel, 1995). However, for beginning learners in EFL contexts where English is mostly taught in the classroom instead of being acquired through daily communication, translation is an inevitable and necessary strategy for English learners to obtain meanings efficiently. Compared to word-by-word translation, paraphrasing might be a more helpful strategy that allows learners to make the best use of their first language in supporting meaning construction.

Third, this study signals the importance of incorporating elements that could raise students' reading interest in English reading instruction. Selecting interesting texts or tasks as the reading materials might be the first step. According to the results from this study, several criteria (e.g., novelty and importance of the content and

relevance of the text to students' background knowledge and prior experiences) could be applied to judge whether the text would be interesting for students. The difficulty of the tasks or texts could be another component that interacts with students' language proficiency. Teachers should select texts of intermediate difficulty level so students could be challenged but still feel a sense of control over the tasks. As could be seen, it is necessary for teachers to know their students' background very well in order to make these judgments.

As for how to design interesting English reading instructions, the study recommends the *ARCS Model of Motivational Design* by Keller (1984; 1987) to be teachers' guidelines. The essential motivational components within this model are very similar to the sources of reading interest identified in this study. In this model, four elements are introduced as the important sources to increase students' motivation: (1) attention, (2) relevance, (3) confidence and (4) satisfaction. The following teaching strategies are some examples to incorporate these interest-related elements into an English reading classroom.

1. Attention: Teachers could grasp students' attention by presenting reading materials with ideas that are surprising, novel, incongruent, or different from students' prior experiences. Posing challenging questions or problems could also raise students' curiosity.

2. Relevance: Teachers could use concrete and familiar examples, languages or visual representations to explain abstract ideas. Teacher could also emphasize the relationship between the reading materials and students' personal life, such as its worth and usefulness to raise students' awareness of how the English texts could be relevant to themselves.

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3. Confidence: Teachers should design appropriate and meaningful reading activities or tasks from which students could gain successful experiences. Supportive and constant feedbacks are also necessary to sustain students' motivation toward task completion.

4. Satisfaction: Extrinsic or intrinsic rewards to recognize students' performance are essential to increase students' feelings of satisfaction from learning. The rewards could be either a prize or teachers' compliment. For older learners, intrinsic rewards, such as the sense of achievement from fulfilling a challenging task or the enjoyment from reading itself, might become more effective to reinforce students' feelings of satisfaction than extrinsic rewards.

Conclusion

There are four purposes underlying the present study: (a) to identify types of L2 reading strategies employed by eighth-graders in Taiwan in reading English expository texts, (b) to examine methodological rigor of a multi-method design for assessing L2 reading strategy use, (c) to explore how one rarely-addressed affective factor, reading interest, relates to L2 reading comprehension, and (d) to understand the relationships among reading strategy use, reading interest and L2 reading comprehension.

The findings revealed that the L2 readers utilized a variety of reading strategies to form the textbase, integrate their prior knowledge to construct the situation model of the text and monitor these processes metacognitively. To form the textbase, translation strategies, including word-by-word translating and paraphrasing, and determining meanings of words or sentences were frequently applied. As for constructing the situation model, the readers elaborated the text content, drew

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inferences to generate causal relationships, gave evaluations, and summarized the main ideas. These deep-processing strategies were used at the conceptual level and the processes were similar with L1 reading. Furthermore, the study showed that the degree of sophistication in strategy use assessed by think-aloud protocols was more associated with the readers' text recalls than the quantity of total strategy use. It indicated how readers intentionally and carefully process each strategy plays a significant role to improve reading comprehension.

With respect to the effects of reading interest, the study found that several content characteristics could enhance the L2 readers' interest in this text; they are relevance, importance, novelty and familiarity of the ideas contained in the text. Moreover, reading interest was shown to influence the depth of readers' strategic engagement. The less proficient L2 reader who possessed high reading interest demonstrated an attempt to employ higher-order, situation model construction strategies during reading, while the low-interest reader who had strong English achievement scores did not intend to comprehend the text in more depth and utilized the strategies at the superficial level. These findings presented a dynamic picture of the intertwined relationship between strategy use and reading interest in L2 reading comprehension.

To conclude, the findings of this study shed light on the methodological issues of strategy research and the importance of interactions between cognitive processes and motivational processes in L2 reading. The study calls for more attention to pedagogical practices on implementing L2 reading strategy instruction in the EFL context and incorporating teaching strategies to increase language learners' interest in L2 reading.

Appendix A: TOEIC Reading Comprehension Test

班級 _____ 座號_____ 姓名:_____

第一部分:英文閱讀

A. 克漏字選擇題

51. Thank you very much for ——— us here.

(A) invite
(B) invited
(C) have invited
(D) inviting

52. After thirty minutes, ——— remove the dish from the oven.

(A) carefully
(B) careful
(C) more careful
(D) most careful

53. The community talent show was canceled because we sold very few ———.

(A) tickets
(B) bills
(C) labels
(D) notes

54. Alice Shapiro is a close friend of ———.

(A) my
(B) myself
(C) me
(D) mine

55. ——— I prefer coffee, I usually drink tea at work.

(A) Even
(B) Although
(C) But
(D) Despite

56. Many people ——— that Diana Franklin wins the election tomorrow.

(A) like
(B) want
(C) hope
(D) expect

B. 閱讀測驗選擇題

From: Mark Hampton

To: David Smith

Cc:

Sent: Thursday, 7:00 P.M.

Subject: Tomorrow night

Hi David,

My father has given me two tickets to the baseball game tomorrow night. Do you want to come? It starts at 8:00 p.m. If you can make it, give me a call here at home tonight or early tomorrow. If I don't hear from you by tomorrow morning, I'll assume you can't make it.

Mark

83. Where is Mark now?

(A) At a café
(B) At a friend's house
(C) At his home
(D) At a baseball stadium

84. What does Mark want David to do?

(A) Go with him to a game
(B) Eat dinner with him
(C) Visit him at home
(D) Leave a message with his father

85. When must David reply?

(A) By this evening
(B) By tomorrow morning
(C) By tomorrow afternoon
(D) By tomorrow night

Americans prefer Italy, British like Australia

A new survey of American and British travelers was published today. The results show that most Americans enjoy taking holidays in Europe, primarily Italy. Most British people, on the other hand, would rather travel to Australia.

"It rains a lot in England, so I think British people like to go to Australia where it's warm and sunny," said Patricia Marmond, a travel agent in London. For Americans, they like to experience the culture of Europe. "Italy has a lot of history and it is amazing to many Americans," Marmond said. "Britain is an old country, so people here aren't as amazed by history in other countries," she added.

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90. What is this article about?
(A) Why England and America are popular.
(B) The weather in Europe in the summer.
(C) The history of the U.S., Australia and Britain.
(D) Where the British and Americans like to go.

91. Why do British people like Australia?
(A) It has a lot of history and culture.
(B) It is close to England.
(C) It has nicer weather.
(D) It is more amazing than America.

92. Which statement is NOT true?
(A) Most Americans prefer to go to Australia.
(B) Many Americans enjoy traveling to Italy.
(C) Many Americans think Italy is amazing.
(D) Most British do not visit Italy

Appendix B: Think-aloud Training Protocol

Below is the instruction I give to participants both orally and verbally.

"In this task, you will read an English text and then say aloud what you think, feel or want to do in your mind during reading. I am interested in your thoughts, feelings and actions when you try to comprehend this text. It doesn't matter what you say is correct or wrong. Please read the text as you naturally read an English text. You can read it aloud or read it silently. In case you forget to do the think-aloud, the red stars in the text are to remind you of speaking out any ideas in your mind when you see them. You can also stop at any time if anything comes to your mind during reading and say it to me. On the other hand, if nothing is on your mind for the sentence, it is okay for you to pass the sentence and keep reading.

Now, I am going to show you how to perform the think-aloud activity with a short text. Remember, the way I read a text might be different from how you are used to reading a text. You do not need to follow my reading behaviors."

Appendix C: Practice Text

Animal's different ways to show their feelings

Different animals have different ways of showing their feelings or thoughts.☆Let's take dogs and cats for example. ☆ A dog barks to scare us and to show someone is at the door of your house. ☆ But a cat meows only to show it feels hungry. ☆ Both cats and dogs wag their tails (尾巴), but it means different feelings.☆ A dog wags its tail to show its happiness when its owner comes back.☆ But, a cat wags its tail to show it is angry.☆ Dogs show their love to their owners by licking (舔)them.☆ But cats lick your hand only because they want to eat the salt(鹽巴) on your hand.☆ When cats love you, they may sit on your hand.☆ Besides, dogs run after your bicycle for fun, but cats never do that.☆

In short, to raise different animals, you should be familiar with the ways animals express their feelings.☆

Let's enjoy chocolate!

Chocolate is a food made from the seeds of a tropical tree called the cacao.☆The word, chocolate comes from *chocolatl.* This is a Spanish word, meaning "hot water".☆There are several kinds of chocolate. <u>Pure, unsweetened</u> chocolate only has cocoa solids and cocoa butter.☆ Much of the chocolate which we eat today is <u>sweet chocolate</u>, combining chocolate with sugar.☆White chocolate has cocoa butter, sugar, and milk but no cocoa solids.☆

The best kind of chocolate is **dark chocolate** with 70% of cocoa. The higher the percentage, the darker the chocolate.☆ Cocoa has a lot of antioxidants.☆Antioxidants can lower the cholesterol in our blood.☆We know high cholesterol can cause heart diseases.☆The antioxidants in chocolate can lower the cholesterol in our blood, so eating some chocolate can prevent heart diseases.☆ Eating chocolate can also make us feel happy, because dark chocolate has caffeine. Caffeine can help us have good feelings, such as happiness and attentiveness.☆

antioxidant
抗氧化物
lower
降低
cause 引起

White chocolate is different from dark chocolate because it is made from cocoa butter, not the cocoa.☆ Therefore, it does not have the good antioxidants in dark chocolate.☆ Cocoa butter has very little caffeine, so white chocolate doesn't' have as much caffeine as dark chocolate.☆ Eating white chocolate cannot make us feel happy as eating dark

chocolate.☆

There are some bad things about chocolate. ☆   Chocolate has calories and fat— about 150 calories for one ounce. ☆ Too many calories will make people fat. ☆ A good news is that little chocolate every day is beneficial for our health. ☆ Eating 30 calories a day will not make us become fat (30 calories is the same as a chocolate candy kiss. ☆

Appendix E: Propositional Units in the Chocolate Text

1. Chocolate is a food made from the seeds of a tropical tree,

2. called cacao.

3. The word, chocolate comes from *chocolatl.*

4. This is a Spanish word.

5. meaning "hot water".

6.There are several kinds of chocolate.

7.Pure, unsweetened chocolate only has cocoa solids.

8. and cocoa butter.

9. Much of the chocolate which we eat today is <u>sweet chocolate</u>,

10. combining chocolate with sugar.

11. White chocolate has cocoa butter,

12. White chocolate has sugar,

13. and milk

14. but no cocoa solids.

15. The best kind of chocolate is dark chocolate,

16. with 70% of cocoa.

17. The higher the percentage, the darker the chocolate.

18. Cocoa has a lot of antioxidants.

19. Antioxidants can lower the cholesterol in our blood.

20. We know high cholesterol can cause heart diseases.

21. The antioxidants in chocolate can lower the cholesterol in our blood,

22. so eating some chocolate can prevent heart diseases.

23. Eating chocolate can also make us feel happy,

24. ,because dark chocolate has caffeine.

25. Caffeine can help us have good feelings,

26. such as happiness,

27. and attentiveness.

28. White chocolate is different from dark chocolate,

29. because it is made from cocoa butter,

30. ,not the cocoa.

31. Therefore, it does not have the good antioxidants in dark chocolate.

32. Cocoa butter has very little caffeine,

33. so white chocolate doesn't' have as much caffeine as dark chocolate.

34. Eating white chocolate cannot make us feel happy as eating dark chocolate.

35. There are some bad things about chocolate.

36. Chocolate has calories

37. and fat.

38. about 150 calories for one ounce.

39. Too many calories will make people fat.

40. A good news is that little chocolate every day is beneficial for our health.

41. Eating 30 calories a day will not make us become fat.

42. 30 calories is the same as a chocolate candy kiss.

Appendix F: Multiple-choice Reading Comprehension Questions

1. Originally, the word, chocolate, means

A). Maya and Aztec

B). Spanish

C). cacaco

D). hot water

2. Pure chocolate does NOT have

A). sugar

B). calories

C). cocoa solids

D) cocoa butter

3. Which of the following chocolate is darker?

A). Chocolate has 50% cocoa

B). Chocolate has 60% cocoa

C). Chocolate has 70% cocoa

D).Chocolate has 80% cocoa

4. Dark chocolate is good for our health because of _____

A). cholesterol

B). flavonoids

C). sugar

D). smoke

5. Eating dark chocolate can help us have many good feelings because of

A). cholesterol

B). antioxidants

C). caffeine

D). flavonoids

6. Heart diseases happen because _____

A). we eat too much dark chocolate.

B). the cholesterol is too high

C). the cholesterol is too low.

D). we have too much caffeine.

7. White chocolate is different from dark chocolate because_____

A) it will make us fat.

B) it doesn't have flavonoids.

C) it has too much caffeine.

D) it has too much cocoa.

8. From this article, how much chocolate a day is good for our health?

A) one once

B) 150 calories

C) 30 calories

D) 2 chocolate candy kisses

Appendix G: The Cogntive-Metacogntive Strategy Questionnaire

Instruction

The purpose of this questionnaire is to understand what strategies you have used to read the article on chocolate. It is important to answer the item base on what you actually did, not what you should do. Please read every item carefully and check one number that can best characterize how often you use that strategy from 0 to 4, where "0" means "almost never" and "3" means "almost always". There are no right or wrong answers to these statements. Your answers will not affect your grades.

1. I planned what to do before I began to read this text.			
0	**1**	**2**	**3**
2. I made sure I clarified the goals of the reading task.			
0	**1**	**2**	**3**
3. I considered essential steps needed to complete the reading task.			
0	**1**	**2**	**3**
4. I made sure I understood what had to be done and how to do it.			
0	**1**	**2**	**3**
5. I knew what to do if my intended plans did not work efficiently while completing this reading task			
0	**1**	**2**	**3**
6. I flipped through the reading task before I actually stated to complete it.			
0	**1**	**2**	**3**
7. I tried to understand the relationships between ideas in the text and tasks.			
0	**1**	**2**	**3**
8. I tried to understand the content of the text without looking up every word.			
0	**1**	**2**	**3**
9. I thought what was going to happen next while I was reading the text.			
0	**1**	**2**	**3**
10. I analyzed what the author meant or tried to say in the text.			
0	**1**	**2**	**3**
11. I tried to interpret hidden ideas/meanings in the text.			
0	**1**	**2**	**3**
12. I translated the text, tasks, or questions into my first language.			
0	**1**	**2**	**3**

13. I summarized the main information in the text.
0   **1**   **2**   **3**
14. I related the information from the text or tasks to my prior knowledge or experience.
0   **1**   **2**   **3**
15. I reread texts or tasks several times when I felt I did not understand them.
0   **1**   **2**   **3**
16. I know which information was more or less important.
0   **1**   **2**   **3**
17. I identified or guessed meanings of unknown words using context clues.
0   **1**   **2**   **3**
18. I applied my learned grammar rules while reading and completing the reading task.
0   **1**   **2**   **3**
19. I guessed meanings of unknown words using root words.
0   **1**   **2**   **3**
20. I checked if I understood the text.
0   **1**   **2**   **3**
21. I checked my own performance and progress as I moved along the reading.
0   **1**   **2**   **3**
22. I knew when I lost concentration during reading.
0   **1**   **2**   **3**
23. I evaluated my plans or goals of my reading constantly.
0   **1**   **2**   **3**
24. I knew when I should read or complete the reading more quickly or carefully.
0   **1**   **2**   **3**
25. I double-checked my reading comprehension.
0   **1**   **2**   **3**
26. I immediately corrected my misunderstanding when found.
0   **1**   **2**   **3**
27. I know when I felt worried, tense or unmotivated during reading.
0   **1**   **2**   **3**

Appendix H: Semi-structured Retrospective Interview Questions

1. What do you think makes the text interesting? Which part of the text do you think is more interesting and why?

2. What do you think makes the text uninteresting? Which part of the text is uninteresting and why?

3. Which part of this article do you think is difficult for you to read? Why?

4. How did you solve the difficulties in reading this text?

5. Do you feel interested and engaged during reading?

6. Were you concentrated when you were reading? When were you most concentrated and when did you feel distracted?

Appendix I: Sources of Interest Questionnaire

Instruction

  The purpose of this questionnaire is to understand your thoughts on the text you just read. Please read each statement and check one number that can best represent how well the statement describes your opinions. "0" means "Do not agree", "1" means "Partially agree", "2" means "Largely agree", and "3" means "Totally agree". There are no right or wrong answers to these statements. Your answers will not affect your grades.

1. The text is easy to understand.
0   **1**   **2**   **3**
2. The text's main ideas are presented clearly.
0   **1**   **2**   **3**
3. The text covers a topic I have read about or heard about before.
0   **1**   **2**   **3**
4. The text contains information that I am familiar with.
0   **1**   **2**   **3**
5. The text has vivid and exciting details.
0   **1**   **2**   **3**
6. The text is thought-provoking.
0   **1**   **2**   **3**
7. The text contains some unforgettable information.
0   **1**   **2**   **3**
8. The text is easy to picture in my mind.
0   **1**   **2**   **3**
9. The text makes me happy.
0   **1**   **2**   **3**
10. The text makes me upset.
0   **1**   **2**   **3**

Appendix J: Interest Experience Scale

Instruction

The purpose of this questionnaire is to understand how you feel when you read the English text. Please read each statement and check one number that can best represent how well the statement describes your feeling or thought about the text. "0" means "Do not agree", "1" means "Partially agree", "2" means "Largely agree", and "3" means "Totally agree". There are no right or wrong answers to these statements. Your answers will not affect your grades.

1. I didn't think this reading task is hard.			
0	**1**	**2**	**3**
2. I felt lost and didn't know what to do to help me comprehend this text.			
0	**1**	**2**	**3**
3. I encountered some difficulties during the reading process and did not know how to solve them.			
0	**1**	**2**	**3**
4. I often felt distracted during the reading process.			
0	**1**	**2**	**3**
5. I felt this task was very difficult for me.			
0	**1**	**2**	**3**
6. I felt curious about what the text said during reading.			
0	**1**	**2**	**3**
7. I felt that this text was very interesting.			
0	**1**	**2**	**3**
8. Rreading this text was fun.			
0	**1**	**2**	**3**
9. I was very absorbed when I read this text.			
0	**1**	**2**	**3**

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