ATTRIBUTES OF MEANING CONSTRUCTION AND STRATEGY USE
AMONG HIGHER- AND LOWER-PERFORMING
ADOLESCENT READERS OF CHINESE AND ENGLISH

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ABSTRACT

This study examined the ways in which Taiwanese adolescent readers
approached texts written in two varieties of their first language i.e., classical and
contemporary literary styles of Chinese, along with a foreign language i.e.,
English. The construction-integration model of text comprehension (Kintsch,
1998, 2004) and reader response theory (Beach, 1993; Galda & Beach, 2001)
served as the theoretical frameworks for this study. Data included semi-structured
interviews and think-aloud protocols. The constant comparative method proposed
by Glaser and Strauss (1967) was employed for data analyses. Overall, the data
show that the text processing mechanism utilized by the bilingual readers of
Chinese and English appeared to follow the procedure of the
construction-integration model of reading. Lower-level processes became
substantially salient as students read the texts written in classical literary styles of
Chinese and contemporary English, respectively. In contrast, relatively
higher-level comprehension processes were evident in students' reading of texts
written in contemporary Chinese. The degree of language transfer, particularly in
the employment of mental translation, indicates a 'linguistic interdependent
relationship' between one's two languages, as posited by Cummins (1979).

Key Words: reading comprehension, reading in Chinese, foreign language reading,
            adolescent literacy, bilingualism, translation

INTRODUCTION

The body of literature on text comprehension has called for the
exploration of a reader's process of meaning construction especially when
reading his or her two languages (Grosjean, 2001). One general
conclusion that emerges from the literature thus far is that both bottom-up

(e.g., decoding and word recognition) and top-down (knowledge-based or comprehension-based) processes are important determinants of reading success (Daneman, 1996; Droop & Verhoeven, 2003; Nassaji, 2003). Previous and current research has shown that efficient bottom-up processing skills not only are key factors in beginning reading but are also integral components of fluent and skilled reading (Birch, 2002; Bruck & Waters, 1990; Cunningham, Stanovich, & Wilson, 1990). Droop and Verhoeven (2003), however, argued that top-down processes are more influential than bottom-up processes are, especially in the development of text comprehension.

Drawing evidence from the studies on first (L1) and second (L2) language reading, one can find a link between the efficiency of the component processes and reading skills at both expert and novice levels. This can be illustrated by Droop and Verhoeven's (2003) study examining the extent of interaction among oral language, word decoding, and reading comprehension capacities among L1 and L2 young readers of Dutch in the Netherlands. The researchers found that as decoding skills become more automatic, their influence on reading comprehension decreases, yet the role of various top-down processes increases. From third grade on, decoding skills play a minor role in reading development and have little effect on reading comprehension. Moreover, during the initial stages of literacy acquisition, the combined influence of the factors such as word decoding, vocabulary knowledge, morphosyntactic processing, and oral text comprehension is much stronger for L2 readers than for L1 readers (Droop & Verhoeven, 2003). Examining L2 adult learners of English, Nassaji (2003) found that both lower-level component processes and higher-level syntactic and semantic processes contributed significantly to the distinction between skilled and less-skilled second language reading comprehension. Overall, these studies shed light on our understanding of the extent to which the component processes and skills contribute to L1 and L2 reading. Most of these studies centerd on the investigation of readers from alphabetical languages, however. The mechanisms that govern text processing of readers from non-alphabetic language backgrounds such as Chinese remain largely unexplored.

Aside from the examination of text processing mechanisms, numerous studies conducted during the last three decades have looked into the role of "automatic" and "strategic" processing in text comprehension. Automatic processes are mental events that are "fast, not sensitive to conscious expectations, produce benefits but few costs, are unintentional,

require few mental resources, and do not benefit from further training" (McNamara, Miller, & Bransford, 1996, p. 505). Kintsch (2004) has postulated that the reading process entails automatic comprehension and problem solving, and that text comprehension involves "automatic meaning construction via constrain satisfaction, without purposeful, conscious effort" (p. 1271). Conversely, strategic processes involve mental events that are "slow, sensitive to conscious expectations, produce both costs and benefits, are intentional, require mental resources, and improve with training" (McNamara et al., 1996, p. 505).

One line of research on strategic reading is the investigation of children learning their native language (e.g., Baker & Brown, 1984; Daneman, 1996; Lau & Chan, 2003; Paris, Wasik, & Turner, 1996; Yau, 2005). Expert readers of English used more strategies to aid text comprehension than neophyte readers (Baker & Brown, 1984). They could understand the literal meaning of a text, infer its main ideas, analyze textual organization, and recognize the author's tone and style, while neophyte readers had difficulties understanding or retaining the main points in a text (Daneman, 1996; Just & Carpenter, 1987). Studies of reading characteristics displayed by children learning Mandarin Chinese as their first language point out the impact of metacognitive knowledge and strategic reading on reading development (Lau & Chan, 2003; Yau, 2005). Not only did good readers of Chinese from Hong Kong use more reading strategies, they also used higher cognitive strategies (e.g., generalization, construction, error detection, and summarization) than did novice readers (Lau & Chan, 2003). Using a think-aloud method, Yau (2005) explicitly discussed reading characteristics manifested by skilled and less skilled readers of Mandarin Chinese. Higher cognitive strategies such as inferencing, summarizing, and synthesizing were employed by the proficient reader, whereas the lower cognitive strategies such as paraphrasing, bridge inferencing, and retelling were utilized by the less proficient reader. These findings are in line with those found in the studies of monolingual children of English: Good readers employ not only more strategies but also higher cognitive strategies while reading (Baker & Brown, 1984; Daneman, 1996; Paris et al., 1996). Likewise, they reinforce the notion that strategic reading is "a prime characteristic of expert readers because it is woven into the fabric of children's cognitive development and is necessary for success in school" (Paris et al., 1996, p. 609).

Another line of research on strategic reading is the exploration of either children or adults learning a second language (e.g., Jiménez, García,

& Pearson, 1995; Knight, Padron, & Waxman, 1985; Malakoff & Hakuta, 1991; Padron, Knight, & Waxman, 1986; Padron & Waxman, 1988). In a similar vein, L2 readers use a variety of strategies to monitor text comprehension by asking questions, rereading, imaging, predicting, and so forth. In contrast to monolingual readers, bilingual readers demonstrate the ability to translate from one language to another (Kern, 1994; Malakoff & Hakuta, 1991). Translation skills can reflect how well bilingual readers come to understand the impact of their two languages in terms of communication (Malakoff & Hakuta, 1991) as well as provide a means for solving difficulties that occur in reading (Kern, 1994). An awareness of the relationship between one's two languages contributes significantly to skilled bilingual reading, as postulated by Jiménez et al. (1995). In a sense, the strategic processes in reading one's second language are somehow identical to those in reading one's first language. In another sense, metalinguistic awareness and translation skills are deemed distinctive features of bilingual readers.

Previous and current research has explored the complexity of interaction between a text and a reader's cognitive process. Variables that influence the processes, strategies, and procedures of bilingual reading include the application of linguistic knowledge, activation of appropriate background knowledge, and awareness of one's reading process. This suggests that a reader's linguistic knowledge, schemata, and metalinguistic awareness have an impact on text comprehension and interpretation. Again, most of these studies have scrutinized reading characteristics of L2 or bilingual readers from alphabetical language backgrounds such as English, Spanish, French, and Dutch. Relatively few studies have investigated bilingual readers whose first language is from a non-alphabetical script such as Chinese and who have learned an additional language in a non-target language context. Neither have they compared the ways in which bilingual readers approach texts written in their two languages. In this spirit, this study investigated reading processes, strategies, and procedures employed by Chinese-English adolescents with higher and lower reading proficiencies. The terms first and second language refer to the chronology of learning languages (Stern, 1983). Mandarin Chinese, consisting of classical and vernacular forms, is referred to as a first language, whereas English that is not a person's home or main language was a second or "additional" language (Cook, 2003).

Following a qualitative approach, this study proposed the following research questions: What knowledge and skills do the higher- and

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lower-proficiency readers of Chinese and English bring in order to process texts written in their two languages? And what strategies or procedures do they employ in their discoveries of the languages?

RESEARCH METHODOLOGY

The theoretical frameworks, criteria for the selection of focal students, and the methods of data collection and analyses for this study are presented in the subsequent section.

Theoretical Frameworks

The construction-integration (CI) model of text comprehension (Kintsch, 1998, 2004) and reader response theory (Beach, 1993; Galda & Beach, 2001) served as the theoretical frameworks for this study. The CI model of text comprehension provided a general framework for scrutinizing a reader's mental process involved in meaning construction. Three levels of the mental representation of texts—surface structure, textbase, and situation model (Kintsch, 1998)—would be scrutinized. That is, this study looked closely at the extent of how the bilingual readers of Chinese and English generated surface representations from a text, organized their idea units, and subsequently formulated their mental representations derived from the text's macrostructure. Additionally, reader response theory bestowed a guiding principle for exploring sociocultural perspectives on texts, readers, and contexts. A reader's response to a written text is regarded as "a construction of text meaning and reader stances and identities within larger sociocultural contexts" (Galda & Beach, 2001, p. 66). Following this theoretical framework, a bilingual reader's goals, interests, beliefs, prior knowledge and experiences would be taken into account as well.

Participating School and Students

The participating high school was located in a rural, working-class community on the outskirts of a metropolitan city in northern Taiwan. During the school year of 2004-5, 371 students, consisting of 208 boys (56%) and 163 girls (44%), were enrolled in a college-preparation program in this school. The students participating in this study were all enrolled in the program, and were selected through snowball sampling, a

method for locating critical cases (Patton, 1990). The criteria for selection included teachers' recommendations, grade reports, scores on regional and nation-wide achievement tests, and the ability to think aloud. In the initial phase of participant selection, nine students, four males and five females, were identified as either higher-performing or lower-performing bilingual readers based on their teacher's recommendations, their grade reports, and their results from regional tests. In terms of English literacy performances, the five students were in the top 5% of their cohort group in the participating school, while the other four were in the bottom 5%. In terms of Chinese literacy performances, the five higher-performing students were in the top 15%, and the rest were in the bottom 15% of their cohort group. All of the participating students were interviewed, and all took part in think-aloud protocols.

In the second phase of participant selection, the participating students' Chinese and English literacy performances on the 2005 nation-wide examinations were taken into consideration. The aim of the annual examination is to measure the knowledge of particular subjects and the ability to apply that knowledge. Most of the colleges in Taiwan require or recommend one or more of these tests for admission or placement purposes. A positive relationship between Chinese and English literacy performances ($N = 379$; $r = 0.4$; $p < 0.000$) was found in this nation-wide examination, which was taken by Grade 12 students from the participating school in January, 2005. In addition, the ability to think aloud was an important criterion for inclusion. Following the criteria, four focal students (two males and two females) were chosen. Eileen and John were higher-performing bilingual readers, whereas Lynn and Gee were lower-performing ones; these names are all pseudonyms. Table 1 shows the background information of the focal students.

It is worthwhile mentioning that Chinese lessons officially begin in kindergarten or Grade 1, and English lessons in Grade 7 for this cohort group. All of the participating students began their English lessons at least one or two years earlier, however. In terms of Chinese and English literacy performances, Eileen and John scored at or above the 85 percentile of their cohort group, while Lynn and Gee scored either at or below the 40 percentile on the 2005 nation-wide examination. There were approximately 157,000 examinees, 51% of whom were boys and 49% girls. The scales (0-15) were used to report the test; the midpoint for the Chinese fell on Scale 10 and that for the English on Scale 8, according to the College Entrance Examination Center on Taiwan (n.d.).

Table 1.   Student Background Information

Category	Student Name			
	Eileen	**John**	**Lynn**	**Gee**
Gender	F	M	F	M
Age	17.3	17.5	17.8	18.0
Home languages	Mandarin	Mandarin	Mandarin/ Taiwanese	Mandarin/ Taiwanese
Years of learning English	9	9	9	7
Chinese literacy performance[*]	12 (85 - 93.7 percentile)	12 (85 - 93.7 percentile)	7 (17 - 27.3 percentile)	8 (27.3 - 40.7 percentile)
English literacy performance[*]	13 (92.5 - 97 percentile)	12 (86.7 - 92.4 percentile)	4 (20.6 - 30.3 percentile)	3 (9.4 - 20.5 percentile)

Note. [*]Source: The College Entrance Examination Center, Taiwan (n.d.)

Data Collection and Procedure

Data in this study were derived from semi-structured interviews, think-aloud protocols, and field notes. The participating students were interviewed for 20 to 30 minutes in order to understand their views, perceptions, and attitudes with regard to reading their two languages, as well as their knowledge and application of strategic reading. The interview questions were mostly based on those posed by Jiménez and his associates (1995). For example, the participating students were asked the following questions: (1) Could knowing both Chinese and English help someone to be a better reader, or would it cause problems? Why? (2) Do you ever translate from one of your languages to the other when reading English or Mandarin? Describe the process to me. (3) How is reading Mandarin different from reading English and vice versa? The interviews were conducted in Mandarin Chinese and were audio-recorded. This was followed by a think-aloud protocol, which is regarded as an effective means for discovering the processes and knowledge underlying reading behaviours (Baker & Brown, 1984).

All of the participating students were trained for the think-aloud protocol. First, the students watched a demonstration film and practiced by reading one or two Chinese passages. Next, the participating students'

prior knowledge concerning important concepts or ideas of a designated passage was examined prior to reading. In other words, they were asked to jot down the meanings of a list of words and phrases taken from a designated passage, as well as to respond in writing to a prompt associated with its central ideas or concepts. For example, the prompts for *Travelling Time* (Chapman & Robson, 1995, p. 28) were as follows: "Please write down what you know about the concepts of *Standard Time* and *Local Time*" and "Please explain why there is a one-hour time difference between Taipei and Tokyo." The prompts were given in both Chinese and English. Afterwards, the participating students began reading the designated passage. The think-aloud protocols were both audio- and video-recorded.

Altogether, each participating student read six passages: three narratives and three expositions; two of these were written in contemporary literary styles of Chinese (also called 'bai35hua51'), two were in classical literary styles of Chinese (also called 'wen35yan35'), and two were in contemporary English. The rationale for selecting the two varieties of Chinese was that, on average, 65% of the language arts curriculum for Grades 10-12 consisted of texts written in the classical literary styles (wen35yan35), while texts written in the contemporary styles (bai35hua51) made up 35% of the curriculum between 1995 and 2005, according to the Department of Secondary Education at the Ministry of Education on Taiwan (n.d.). The levels of difficulty and interest they presented were taken into consideration as well. Theoretically speaking, reading classical Chinese passages was deemed most challenging due to the specific demands of linguistic and cultural knowledge for text comprehension. A variety of interesting topics were chosen, including problems of travel and time zones, descriptions of stem cells, and a debate over short-lived and long-lived statesmen (see Appendix for the titles of the designated Chinese passages). The length varied from 260 to 1000 words/characters; the classical Chinese passages, roughly speaking, were the shortest.

Data Analysis

Glaser and Strauss's (1967) constant comparative method was employed for data analysis. At first, the researcher read and re-read transcripts and notes, and then created an initial profile for each participating student. Next, the data were coded and categorized based on the research questions of this study; the categories used were views on

reading, reading strategies reported in the interviews, and reading strategies employed during the think-aloud protocols. Third, significant themes were identified and later evaluated by cycling back and forth between theory and data in order to identify patterns and regularities. For example, the idea of mental translation developed in relation to one part of the data was scrutinized in other parts, and the instances were located in relation to established patterns. This process involved making comparisons and looking for similarities and dissimilarities in different parts of the data. Linking and sorting were applied during this phase; that is, connections were made between different parts of the data, and similarities and dissimilarities were examined by using different dimensions of the data.

The final stage of analysis involved triangulation of the data from the qualitative data sources, "comparing and cross-checking the consistency of information derived at different times and by different means within qualitative methods" (Patton, 1990, p. 467). In this study, the multiple methods included interviewing, document analysis, field notes, and think-aloud protocols. The researcher compared not only data within one participating student but also compared the data of one with that of the others. By using a combination of multiple-source information, the researcher was able to validate and cross-check findings. Furthermore, experts were consulted, including English and Chinese teachers at the participating school and others, as well as university professors specializing in the fields of Chinese literature, English learning/language teaching, and translation. Their input and comments on the quality of the analyses provided a guideline for composing detailed student profiles. When a different perspective regarding the analysis occurred, the researcher reread the uncoded data or returned to the participating school to gather relevant information to validate the preliminary findings. For example, one participating student was first identified as a poor reader of Chinese by his teacher, but this student performed well on the think-aloud. For further evaluation, the student's original data were re-read by the research team of this study composed of the author and two teachers of Chinese language arts in order to validate the previous analysis of this particular student. This group of experts, on the whole, strengthened the credibility of the findings of this study by helping to establish its trustworthiness.

The following section presents the findings of this study. To keep the following presentation as concise as possible, most data have been translated into English from the original Chinese.

FINDINGS

Regardless of the level of language proficiency and the degree of text comprehension, the focal students in this study approached the reading passages in a similar manner. Lower-level processes (e.g., decoding and word recognition) became substantially more salient as they read considerably challenging texts such as those written in classical Chinese (wen35yan35) and English (their additional language). In contrast, relatively higher-level comprehension processes (e.g., drawing implications or integrating new information with old) were evident when reading the passages written in contemporary Chinese (bai35hua51). Decoding, paraphrasing, translating, drawing inferences, and summarizing were employed by both higher- and lower-performing students in this study, whereas monitoring, editing, and thinking reflectively were mostly found with the higher-performing ones.

Slowly Moving from Part to Whole

As the students read the texts written in classical Chinese and English, a predominantly bottom-up approach to reading emerged in the initial phase. The focal students operated on the words and syntax within a sentence, and then created a phrase-by-phrase translation of the information in the text, occasionally with interference from their own background knowledge. In the second phase, the students were able to construct meanings from the textual input, and they integrated the text with their world knowledge to form a somewhat coherent mental representation of what the text was about, or a situation model. Their reading processes, on the whole, fit into the constructive-integration model of reading proposed by Walter Kintsch (1998 & 2004). Decoding, mentally translating, paraphrasing, making inferences, and summarizing were the most common strategies employed by the readers of Chinese and English in the present study; however, distortions (false inferences) and omissions also occurred frequently during reading. The overall reading behaviours and processes manifested by the focal students can be characterized as sluggish, cautious, and text-driven.

Decoding, word recognition, and vocabulary knowledge

Lower-level processing appeared to play an important role in the reading of English passages by the lower-performing readers in this study. One salient trait distinguishing the less proficient readers from the more

proficient was a wide discrepancy in the use of lower-level processing skills such as decoding, word recognition, and vocabulary knowledge of English. For example, Gee, one of the lower-performing students in this study, neither correctly pronounced nor recognized words such as stones, side, hill, grass, mountains, valleys, wonder, castle, or sight, from *Two Large Stones* by Arnold Lobel (1977, pp. 22-31). During reading, he frequently asked the researcher to provide him with their Chinese equivalents. A weakness at decoding and word recognition was likely to interrupt this student's reading process at times and thus severely hamper his comprehension of the text. On the contrary, the higher-performing students were much better decoders and possessed much more linguistic knowledge than did the lower-performing students. Eileen and John correctly wrote down the Chinese equivalents of most of the English words and phrases on the vocabulary check lists prior to reading, for example.

Mental translation

The term *translation* refers to "carry across" or "moving" something from one to the other (Chesterman, 1997, p. 8). Simply speaking, translation is going from a source to a target or text; a text can be translated across time within one language or between languages (Chesterman, 1997). In this study intra- and inter-language translation were involved. When reading the wen35yan35 passages, the participating students translated the texts from classical to colloquial Chinese, whereas they translated from English to colloquial Chinese when reading the English passages. John and Gee translated both adequately and inadequately in the region of 70% of the idea units generated from the wen35yan35 passages, Lynn, nearly 50%, and Eileen, 40%. When reading the English passages, Eileen and John translated more than 80% of the idea units from the English passages, whereas Lynn and Gee, less than 40%.

It is noted that all of the readers proceeded word by word, phrase by phrase, sentence by sentence, and at last provided a summary. The following excerpts serve as an example of the approach utilized by one proficient (John) and one less proficient (Gee) reader in this study as they read *Fang51niao214* (literally translated as *Freeing Birds)* by Wu (2003, p. 141):

Text: 余書齋中有玉燕兩對，異產也，比雀小些，色白如雪。
        (In my study are two pairs of canaries, which are exotic, slightly smaller than sparrows, and as white as snow.)

John: 在書房裡面有玉燕兩對，比麻雀小一點，顏色是白的，如
雪一樣。
(In the study room there are two pairs of canaries, slightly smaller than sparrows, whose colour is white, like snow.)

Gee: 他說他的書齋中有兩對玉燕，應該是很稀少，很稀少，比
麻雀小一點，牠[們]的顏色是跟雪很像。
(He says that in his study room are two pairs of canaries, which are supposed to be very rare, very rare, and smaller than sparrows, whose colour is very much like that of snow.)

The phrase *yi51chan214ye214* indicates that the canaries were from abroad. Unlike John, who simply omitted the phrase, Gee drew an appropriate inference from the context (the birds are very rare). Throughout the passage, these two Chinese readers, as well as the other two participating students, focused mostly on the written text, and their reading processes appeared to be rather text-driven.

While looking into the processes of constructing the text input, the focal students tended to follow these following steps. First, the text propositions corresponded to the actual semantics of the text. In other words, most of their text propositions were constructed directly from words and phrases in the text. For example, John and Gee adequately stated the type of bird (canaries), number (two pairs), colour (white), and location (the study). Next, the readers generated several relevant propositions that gradually led to the creation of a semantic network. Consequently, a somewhat coherent representation was created in the reader's mind. Elaborative inferences occurred during this process. For instance, after reading the passages depicting how the canaries were treated by their human masters, Gee at first recounted a student's daily activity (getting up, eating breakfast, going to school, and so on), and then stated, "If humans were treated the way these birds were treated, we would not choose to abandon our lives of comfort, either." Subsequently, Gee provided a proposition, 'human inertness,' that summarized the entire passage, and he supported his claim with textual evidence by stating that "those birds are similar to humans who have no desire to change their current circumstances once they are provided with a comfortable life." In a similar vein, John gave a relatively comprehensive summary after reading. He asserted, "Contentment leads to destruction. We must edify ourselves. This passage describes the way in which the birds were attached to their master—waiting to be fed and having little desire to

search for food for themselves or to make their own nests—is applicable to humans." Indeed, the author used the birds' over-reliance on humans as a case in point to explicate the Chinese maxim "Adversity spurs life, while comfort breeds death."

Additionally, it is notable that phrases or sentences referring to culturally specific knowledge were often omitted or distorted during reading. This can be best illustrated by the fact that while reading *Freeing Birds*, the participating students skipped the last sentence. This particular sentence refers to two historical events depicted in the *Zuo Commentary*, which records significant political, military, and diplomatic events between BC 722 and BC 468 (Ma & Huang, 2005). One event was Duchess Jiang's warning to her exiled husband Duke Jin (? – BC 628) that indulging in a life of ease ruins one's name, and the other was Guan Zhong's (? – BC 645; Prime Minister of Qi) conversation with his king that a life of ease is like poisoned wine, therefore one should not stay (Hong, 1982). The author of *Freeing Birds* referred to the events as two pieces of historical evidence to support his contention that comfort breeds destruction (Wu, 2003, p. 141). An identical phenomenon was also uncovered while reading the designated English passages.

The English learners were less able to extract underlying meanings from *Two Large Stones*. Arnold Lobel (1977) depicts two stones living on one side of a hill that are eager to find out what the other side looks like. They asked a bird and a mouse, respectively to look for them across different time periods. The bird reported that the towns, castles, mountains, and valleys were very different from what the stones saw daily, whereas the mouse saw the grass, flowers, and earth that were very similar to what the stones saw every day. After hearing the report from the mouse, the stones inferred that the bird had told them a lie and thus were pleased with their whereabouts. Overall, John and Eileen experienced little difficulty in understanding the literal meaning of the extract; that is, they adequately translated most of the sentences from the passage. This can be best illustrated by the ways in which the higher performing readers read and mentally translated the first two sentences in *Two Large Stones* (A. Lobel, 1977, p. 22): "Two large stones sat on the side of a hill. Grass and flowers grew there." After reading, John stated, "Liang214ge51 da51 shi35tou0 zai51 shan55qiu214 pang35bian55. Cao214 han51 hua55 dou55 sheng55zhang214 zai51 na51li214." His statements included the main characters (i.e., two large stones), and the setting in which the story take place (i.e., a hill on which grass and flowers grew); so did Eileen's. It is

also noted that these two readers were able to adequately identify the speaker and the listener from the conversations portrayed in the English narrative. This is made evident by the fact that all of the dialogue between the story characters was translated appropriately by these two EFL readers. That is to say, they apparently demonstrated sufficient knowledge of the quote structure written in English. Throughout this passage, more than 90% of the words, phrases, sentences were literally translated in a fairly appropriate manner by these two EFL readers. Yet, they had trouble inferring its implications. John explicitly stated that he did not know what this passage was about, and Eileen admitted that the passage was too abstract for her to comprehend. One possible explanation is that inadequacy or insufficiency of culturally relevant knowledge impedes comprehension at a text level.

The processes of inter-language translation took place when the four participants read the English texts. That is, the English learners intended to replace a representation of a text in one language by a representation of an equivalent text in another language. In the beginning, the students employed multiple strategies such as decoding, word recognition, and syntactic parsing to provide the information which develop the mental agility they needed for translation. Generally speaking, the higher-performing students in this study were much more able to adequately translate the English passages into vernacular Mandarin than were the lower-performing students. Their understanding in terms of the events in the story or information depicted in the texts was reflected in the degree of accuracy or appropriateness of their translations. As indicated in the previous section, Eileen and John were much more able than Lynn and Gee to translate the phrases and sentences given in the English passages in an appropriate manner. Another good illustration of this is their reading of *Travelling Time* by Chapman and Robson (1995, p. 28), which describes the establishment of standard and local time. Though Eileen wrote down 'jing55xien51', the Chinese equivalent of longitude, on the vocabulary checklist given prior to reading, she explicitly expressed her puzzlement soon after reading the first sentence of the passage ("We divide the surface of the Earth from north to south into segments, like an orange, using imaginary lines called longitude."). She stated in Chinese, "Is it longitude or latitude? It's longitude! Hey! Let me think. It's latitude. It's probably latitude. Never mind. Yes! It is [latitude]." After reading, Eileen was certain of its meaning in English and Chinese. John, unlike Eileen, did not recognize the word prior to reading, but after reading he wrote down

'jing55wei214xian51" (which means 'longitude and latitude' in Chinese) on the check list. This indicates that John inferred its approximate meaning from the context. Compared to Eileen and John, Lynn and Gee were less able to infer meaning from the context before, during, and after reading, in part because of the presence of many unfamiliar words (e.g., surface, segments, and earth) and phrases (e.g., divide into) in the passage.

Metalinguistic awareness

It is evident that the employment of mental translation is controlled, purposeful, and goal-oriented. Chesterman (1997) pointed out that the translation process begins with problems to solve. The following interaction between the researcher (I) and Eileen (E) illustrates how well this skilled reader was aware of her application of mental translation to reading L1 and L2 texts:

I : When you read a Chinese text, do you think of its meaning in English? Also, do you think of its meaning in Chinese when you read an English text?

E: Of course, I do.

I : Which one do you often do?

E: I do both.

I : Could you give me some examples?

E: I just did it when reading [the designated passages]. When I read the Chinese passages written in the classical literary style, I translated them into colloquial Chinese. I often consider whether or not I can translate them [while reading].

I : In other words, you would translate the texts written in classical Chinese into colloquial Chinese.

E: Yes. When I was reading the English passages, I tried to translate them into colloquial Chinese, too.

I : Do you need to make a translation when reading Chinese texts written in contemporary literary styles?

E: No, I don't need to. (She exclaimed.)

Indeed, Eileen did not translate when reading the designated Chinese passages written in contemporary literary styles; neither did the other focal students. The other focal students likewise acknowledged the use of mental translation. John considered translating in both directions to be a pastime for him; Gee thought that it would be easier for him to understand English texts if he could translate them into Chinese. Though Lynn

regarded translation as troublesome and disliked doing it, the use of translation was found in her think-aloud data. Translating as a reading strategy can be viewed as a way in which the readers seek to solve problems that occur in comprehension of the text. As Kern (1994) claimed, "[L2] students used translation to assist in semantic processing and consolidation of meaning with difficult texts. Mental translation helped maintain concentration and keep information active while students problem-solved and put ideas in a reasonable order" (p. 141). By doing so, the readers can develop a sense of confirmation and assurance about what they have read. Mental translation helps readers understand the text in a precise, rather than a vague, manner.

In contrast, reading behaviours and characteristics that emerged from the readings of the Chinese passages written in contemporary literary styles (i.e., bai35hua51) differed markedly from the readings of the classical Chinese and English passages. The following section discusses the distinctive reading process uncovered from the participating students' think-aloud data.

Relatively Automatic Text Processing

All of the participating students in this study read the bai35hua51 passages with fluency and accuracy. By comparison, the higher-performing students apparently were much more able to adequately summarize a larger chunk of information from the text, integrate information with their prior knowledge or experience, monitor comprehension at a text level, and effectively revise misinterpretations that occurred during reading. The overall reading behaviours and processes manifested by the skilled readers can be characterized as swift, effortless, spontaneous, and context-driven.

Summarization

When composing a summary, a reader first identifies the main ideas and then deletes redundant and trivial information from the text (Baker & Brown, 1984). Immediately after reading the first paragraph from the Stem Cells passage by Hou (2004, p. 77), Lynn and Gee gave a summary:

Lynn: It describes the function of a stem cell, which differs from other cells and can produce many kinds [of cells].

Gee: It says that human cells can be duplicated—one reproduces the other. A stem cell can regenerate more than one kind of cell. For example, a blood stem cell can split up into a red blood cell, a

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> white blood cell, and even a blood platelet. A skin stem cell can be divided into a variety of cells. A stem cell can generate many kinds of cells that have a variety of functions.

Lynn referred to a topic sentence that contains the main idea of this particular paragraph: a stem cell can generate many different kinds of cells, while Gee elucidated the supporting topic sentences by providing specific details (a blood stem cell can split up into a red blood cell, a white cell, and even a blood platelet.). Their statements suggest that they understood what they had read. Lynn's references were concise and Gee's elaborative, while those provided by Eileen and John were characteristically a combination of the two. The following excerpt provides an excellent example:

> The first paragraph points out the differences between stem cells and other cells. It even talks about the fact that a skin cell can mainly replicate a skin cell and that many cells replicate their own kind. But a stem cell is different; it can generate a blood stem cell and a skin stem cell. It can regenerate many different kinds of cells.

At first the topic sentence of this paragraph (e.g., "A stem cell is different from other cells.") was clearly stated, and subsequently the details were presented to support the topic sentence (e.g., a stem cell can regenerate many different kinds of cells; a skin cell can mainly replicate a skin cell). These statements are an indicative of the student's skill to summarize at a paragraph and text level.

Monitoring and revising

In comparison with the other students in this study, Eileen was much more skilful in monitoring her text comprehension. Not only did Eileen monitor her reading comprehension, she also made revisions during reading. For instance, when reading the third paragraph in *The Well of My Childhood* by Xian Yang (2001), Eileen noticed her misinterpretation of the preceding paragraphs and at once made her corrections:

> This paragraph echoes the first and second paragraphs. The third paragraph states that tap-water became popular and the wells disappeared as the society became affluent. But when he was young (a pause) but I just said (paused)

Eileen stopped, looked puzzled, and reread the previous paragraphs. The researcher asked her, "What's the matter?" She relied,

> I'd just said [in the previous paragraph], 'Don't have dreams.' But it is contradictory here. It says here that this well was like a telescope to the author. Though people were very poor at that era, [the author] was full of imagination and anticipation. In other words, when he became older and learned from his life experiences, he regarded this well as his telescope …. He said that this well had signified his aspiration, rendering him fantasies and dreams for the future.

The skilful way in which this student monitored her text comprehension was likewise found in her readings of the designated English passages. Her statements were indicative of how expeditious and spontaneous she was as a reader.

Reflection and application

The higher-performing students in this study were much more able to activate their prior knowledge or experiences to support their claims than the lower-performing ones. This process was spontaneous and there were no pauses observed. A case in point is the students' responses to *The Well of My Childhood* by Xiang Yang (n.d.) describing how a well in his village became a source of imagination and inspiration for him in the 1960's in Taiwan. In responding to the passage, Eileen connected the information from the text to her personal life:

> After reading this paragraph, a saying came to my mind: "Having dreams in life, building dreams steadfastly." I agree with it. We all have dreams at different stages of life…. I'm lucky to have been admitted to college, majoring in English. I anticipate that whatever I do in the future will be somehow related to English. This passage refers to the well as a source of imagination. Because of the imagination and dreams that we possess, I think that we no longer feel hollow and lonesome. That is, we are fulfilled.

Here, Eileen not only connected her personal experience with the text but also spontaneously expressed her anticipation of the future to come. Her response showed how well she understood the passage and how skilfully she applied two higher-level strategies to her reading (reflective thinking and application). Overall, this student demonstrated an ability to "learn

from text" (Kintsch, 2004) by integrating the textual information with her lived experiences in order to solve problems in a new situation. The less-proficient readers were less able to do so in comparison with Eileen. Lynn simply stated, "Tell us its mystery and imaginary space," for example. Her response was so short that it lacked clarity; she failed to elaborate on why the well gave her a sense of mystery or a space for imagination.

In short, a predominately macrostructural process was emerged from the readings of the texts written in modern Chinese. Higher cognitive strategies such as monitoring, revising, reflective thinking, and application were mainly found in the highly proficient readers of Chinese (L1). It is noted that these readers modified their behaviours as they read in accordance with their perceptions of language, structure, and rhetorical style in which a text was written.

DISCUSSION AND IMPLICATIONS

This study examined the ways in which Taiwanese adolescent readers approached texts written in two varieties of their first language i.e., classical and contemporary literary styles of Chinese, along with a foreign language i.e., English. On the whole, the mechanisms used in processing texts appeared to follow the procedure of the construction-integration model of reading postulated by Kintsch (1998 & 2004). This processing mechanism became salient and observable, as the participating students read more challenging texts. The readers tended to translate words, phrases, and sentences of the passage to form ideas, and subsequently organize their ideas into a more or less coherent proposition. The employment of intra- and inter-translation enabled these readers to construct a preliminary propositional network. In a strict sense, these findings point toward a relative reliance on the strategies of paraphrasing and recounting so as to construct a propositional network. It is also noted that weaknesses in decoding and word recognition made the readers more dependent on discourse context in order to process unfamiliar words or phrases. Likewise, an inadequacy in culturally specific or domain knowledge impeded the readers' integration of their relatively incoherent preliminary network into a coherent mental representation. This can be best illustrated by the ways in which the participating students in this study read the English passages. Conversely, the processing of the comprehension of the text was automatic and dynamic in reading one's native language; in this

case, contemporary Chinese. The Taiwanese adolescent readers in this study recognized words rapidly and apparently possessed a free capacity for higher-level integrative and semantic processing. They were less dependent on comprehension of the discourse context when seeking to understand unfamiliar words and phrases. The readers could integrate their preliminary network into a coherent mental representation following the effective use of higher-level strategies (e.g., summarization, revision, reflection, and application). The process of text comprehension can be said to be rather fast and efficient in nature. These findings echo the contentions that automatic word recognition is a prerequisite for fluent reading because it frees capacity for higher-level processing (Stanovich, 2000) and that good readers are both good decoders and top-down processors (Kintsch, 2004).

It is worthwhile noticing that higher cognitive strategies such as monitoring, revising, reflective thinking, and application were relatively absent when the participating students were reading the challenging texts. The skilled readers in this study were much more able to read "between" and "beyond the lines" (Alderson, 2000, pp. 7-8) when reading the passages written in modern Chinese. They demonstrated not only an understanding of the meaning implicitly stated in a text but also an understanding of its main implication. By comparison, these readers were less able to respond in an effective manner to the demands of textual structures when reading texts written in distinctive literary styles of their L1 and/or in their additional language (i.e., English). They apparently struggled to read 'the line' (a literal understanding of a text) and between the lines (Alderson, 2000, pp. 7-8). The relative absence of higher-level processing mechanisms provides evidence of a language threshold at a minimal proficiency in L2 that must be attained in order for L1 skills and strategies to be transferred to reading a second language (Alderson, 1984). As the finding suggests, a teacher's awareness and understanding of what L2 readers need to know in the target language (e.g., vocabulary, grammar, and discourse) to make effective use of their L1 reading comprehension abilities is essential for designing appropriate reading curriculum and instruction that aims at promoting reading comprehension and interpretation. Additionally, the current study primarily looked into the processes of meaning construction among the higher- and lower-performing readers of Chinese and English from a qualitative perspective. In order to further validate the findings reported in this study, future research adopting a quantitative approach with a larger sample size is inevitable.

Mental translation, including both intra- and inter-language translation, was applied to reading texts written in both classical Chinese and English. Apparently, the Chinese-English readers, both proficient and less proficient, applied the processing mechanism utilized in the L1 to reading L2 texts. In a sense, the degree of language transfer, particularly in the employment of mental translation, indicates a linguistic interdependent relationship between one's two languages, as posited by Cummins (1979). In another sense, these findings suggest that the act of translating is "a dialectical interaction between two histories and two cultures," as proposed by Ye (2004, p. 79). In Taiwan as well as other Chinese-speaking communities, on the one hand, intra-language translation has served as a vehicle for promoting a common vernacular language and thereby developing a 'pan-Chinese' identity, and on the other inter-language translation, has arisen as a response to the historical movements of colonization, decolonization, modernization, and globalization (Chan, 2004; Venuti, 1998). As Kucer (2001) argues, "the meaning and language that are built and used will always be framed by the social identity (e.g., ethnicity, culture, and gender) of the individual and the social context in which the language is being employed" (p. 5). Aside from the examination of linguistic and cognitive dimensions, the sociocultural perspective of reading should be scrutinized as well. That is to say, future studies should explore the interplay of various components in terms of linguistic, cognitive, sociocultural, and developmental dimensions of reading one's languages, as well as investigate the reading processes and characteristics manifested by readers from other Chinese-speaking regions such as China, Hong Kong, and Singapore.

REFERENCES

English References

Alderson, J. C. (1984). Reading in a foreign language: A reading problem or a language problem? In J. A. Alderson & A. H. Urquhart (Eds.), *Reading in a foreign language* (pp. 1-24). New York: Longman.

Alderson, J. C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson (Ed.), *Handbook of reading research* (Vol. I, pp. 353-394). New York: Longman.

Beach, R. (1993). *A teacher's introduction to reader-response theories*. Urbana, IL: National Council of Teachers of English.

Birch, B. M. (2002). *English L2 reading: Getting to the bottom*. Mahwah, NJ: Erlbaum.

Bruck, M., & Waters, G. S. (1990). An analysis of the component spelling and reading skills of good readers-good spellers, good readers-poor spellers, and poor readers-poor spellers. In T. Carr & B. Levy (Eds.), *Reading and its development: Component skills approaches* (pp. 161-206). San Diego, CA: Academic Press.

Chan, L. (2004). *Twentieth-century Chinese translation theory: Modes, issues and debates*. Amsterdam: John Benjamins.

Chapman, G., & Robson, P. (1995). *Exploring time*. Brookfield, CT: The Millbrook Press.

Chesterman, A. (1997). *Memes of translation: The spread of ideas in translation theory*. Amsterdam: John Benjamins.

Cook, G. (2003). *Applied linguistics*. Oxford: Oxford University Press.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, *49*, 222-251.

Cunningham, A., Stanovich, K., & Wilson, M. (1990). Cognitive variation in adult college students differing in reading ability. In T. Carr & B. Levy (Eds.), *Reading and its development: Component skills approaches* (pp. 129-159). San Diego, CA: Academic Press.

Daneman, M. (1996). Individual differences in reading skills. In R. Barr, M. L. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. II, pp. 512-538). Mahwah, NJ: Erlbaum.

Droop, M., & Verhoeven, L. (2003). Language proficiency and reading ability in first- and second-language learners. *Reading Research Quarterly*, *38*, 78-103.

Galda, L., & Beach, R. (2001). Response to literature as a cultural activity. *Reading Research Quarterly*, *36*, 64-73.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.

Grosjean, F. (2001). The bilingual's language modes. In J. L. Nicol (Ed.), *One mind, two languages: Bilingual language processing* (pp. 1-22). Malden, MA: Blackwell.

Jiménez, R. T., García, G. E., & Pearson, P. D. (1995). Three children, two languages, and strategic reading: Case studies of bilingual and monolingual readers. *American Educational Research Journal*, *32*, 31-61.

Just, M. A., & Carpenter, P. A. (1987). *The psychology of reading and language*

comprehension. Boston: Allyn & Bacon.

Kern, R. G. (1994). The role of mental translation in second language reading. *Studies in Second Language Acquisition*, *16*, 441-461.

Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. New York: Cambridge University Press.

Kintsch, W. (2004). The construction-integration model of text comprehension and its implications for instruction. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1270-1328). Newark, DE: International Reading Association.

Knight, S. L., Padron, Y. N., & Waxman, H. C. (1985). The cognitive reading strategies of ESL students. *TESOL Quarterly*, *19*, 789-792.

Kucer, S. B. (2001). *Dimensions of literacy: A conceptual base for teaching reading and writing in school settings*. Mahwah, NJ: Erlbaum.

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

Lobel, A. (1977). *Mouse soup*. New York: Scholastic.

Malakoff, M., & Hakuta, K. (1991). Translation skills and metalinguistic awareness in bilinguals. In E. Bialystok (Ed.), *Language processing in bilingual children* (pp. 141-166). New York: Cambridge University Press.

McNamara, T. P., Miller, D. L., & Bransford, J. D. (1996). Mental models and reading comprehension. In R. Barr, M. L. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. II, pp. 490-511). Mahwah, NJ: Erlbaum.

Nassaji, H. (2003). Higher-level and lower-level text processing skills in advanced ESL reading comprehension. *The Modern Language Journal*, *87*, 261-276.

Padron, Y. N., Knight, S. L., & Waxman, H. C. (1986). Analyzing bilingual and monolingual students' perceptions of their reading strategies. *The Reading Teacher*, *39*, 430-433.

Padron, Y. N., & Waxman, H. C. (1988). The effect of ESL students' perceptions of their cognitive strategies on reading achievement. *TESOL Quarterly*, *22*, 146-150.

Paris, S. G., Wasik, B. A., & Turner, J. C. (1996). The development of strategic readers. In R. Barr, M. L. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. II, pp. 609-640). Mahwah, NJ: Erlbaum.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury, CA: SAGE.

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: The Guilford Press.

Stern, H. H. (1983). *Fundamental concepts of language teaching*. London: Oxford University Press.

Venuti, L. (1998). *The scandals of translation: Towards an ethics of difference*. London: Routledge.

Yau, J. C. (2005). Two Mandarin readers in Taiwan: Characteristics of children with higher and lower reading proficiency levels. *Journal of Research in Reading*, *28*, 108-124.

Ye, W. (2004). Debunking claims of xin, da and ya: The afterlife of translations. In L. T. Chan (Ed.), *Twentieth-century Chinese translation theory: Modes, issues and debates* (pp. 77-88). Amsterdam: John Benjamins.

Chinese References

The College Entrance Examination Center, Taiwan (大學入學考試中心). (n.d.).《九十四學年度學科能力測驗統計圖表》[*Statistical reports on the 2005 examination of basic competence*s]. Retrieved September 5, 2005, from http://www.ceec.edu.tw/AbilityExam/AbilityExamStat/94AbExamStat/index.htm

Hong, S. (洪順隆). (Ed.) (1982).《左傳論評選析新編：第一冊》[*Literary analysis of the Zuo Commentary: Volume I*], Taipei, Taiwan: Chinese Cultural University Press.

Hou, S. (侯勁毅). (October, 2004).《人類複製爭議再起》[Revisiting controversial issues on human cloning].《科學發展》[*Science Development*], *382*, 76-77.

Ma, J., & Huang, J. (馬積高、黃鈞). (2005).《中國古代文學史：第一冊》[*History of ancient Chinese literature (Vol. 1)*]. Taipei, Taiwan: Wanjuan.

Ministry of Education, Republic of China (Taiwan) (教育部). (n.d.).《高級中學課程標準》[*Curriculum benchmarks for secondary education, Grades 10-12*]. Retrieved October 16, 2005, from http://www.ylsh.mlc.edu.tw/~teach/course

Wu, L. (吳立軒). (2003).《放鳥》[Freeing birds]. In Q. Tian (田啟文) (Ed.),《台灣古典散文選讀》[*Selected Taiwanese writings of classical prose*] (pp. 141-142). Taipei, Taiwan: Wunan.

Xiang, Y. (向陽). (n.d.).《童年的井》[*The well in my childhood*]. Retrieved May 2, 2005, from http://myweb.hinet.net/home2/sunmoonstar/essb4_41.htm

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APPENDIX

The Titles of the Designated Chinese Passages

Titles in the Original Chinese	English Translation
放鳥 (Fang51niao214)	Freeing Birds
神箴法炙*	Long-Lived and Short-Lived
(Shen35zhen55 fa214zhi55)	Statesmen
童年的井	The Well in My Childhood
(Tong35nian35 de0 jing214)	
幹細胞* (Gan51 xi51bao55)	Stem Cells

Note. *An excerpt was used.