An Early Reading Intervention for an At-Risk Chinese First Grader

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This article describes a customized early reading intervention for a Chinese first grader at risk for failing to learn to read. Building upon observational notes, artifacts, diagnostic teaching, information about classroom performance, and a battery of tests, our goal is to provide insights into ways to develop and implement a one-on-one tutoring program with nonalphabetic readers. The child's progress demonstrated that one-on-one tutoring can appreciably raise the proficiency of a struggling Chinese reader, suggesting that one-on-one tutoring might be worthwhile for the lowest-achieving students learning to read a nonalphabetic writing system.

Editors note:
The editors of *Literacy Teaching and Learning* note that redevelopment of *An Observation Survey of Early Literacy Achievement* in Chinese would entail extensive preparation including securing permission to proceed from the Marie Clay Literacy Trust and International Reading Recovery Trainers Organization, as well as research to ensure its validity and reliability.

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[I]t is the individual adaptation made by the expert teacher to that child's idiosyncratic competencies and history of past experiences that starts him on the upward climb to effective literacy performances.

— Marie M. Clay (2005, p. 63) —

In the last 2 decades, the educational community in the West has made excellent progress in the prevention of reading failure through the careful development and implementation of early reading interventions (Hiebert & Taylor, 1994, 2001; Pikulski, 1994). A notable example of an early intervention program is Reading Recovery, which uses a one-on-one pull-out tutoring model (Clay, 2002, 2005; Pinnell, Fried, & Estice, 1990; Pinnell, Lyons, DeFord, Bryk, & Seltzer, 1994). Other approaches that have been found effective include Success for All (SFA), which is a schoolwide program that provides one-on-one tutoring to children most in need, among other features (Madden, Slavin, Karweit, Dolan, & Wasik 1993; Slavin, Madden, Karweit, Livermon, & Dolan, 1990). The U.S. Department of Education concludes that one-on-one tutoring by qualified tutors for at-risk readers in Grades 1–3 is effective (Institute of Education Sciences, 2003, p. iii). Research suggests that almost all first grade children can learn to read, including those who enter school with low levels of literacy and who in the past would have failed to learn to read in first grade (Taylor, Critchley, Paulsen, MacDonald, & Miron, 2002).

Although research from around the world has indicated that for the majority of children reading problems are preventable with additional support in the form of an effective early reading intervention (Clay, 1998; Wasik & Slavin, 1993), Chinese schools have done little or nothing to intervene early to address reading failure and no government-supported tutoring programs are available in China. The Chinese writing system differs greatly from that of English in that Chinese has a logographic rather than an alphabetic script. Because of the features of the Chinese writing system, dyslexia was once widely believed to affect only readers of alphabetic languages (Rozin & Gleitman, 1977). However, Stevenson and his colleagues (1982) found that the prevalence of dyslexia is actually comparable among American, Japanese, and Chinese children. *Dyslexia*, or alternatively, *specific reading disability*, refers to children who have serious reading difficulties that are not caused by factors such as sensory deficits, socioeconomic disadvantage, and like factors (Stanovich, 1986; Vellutino, Fletcher, Snowling, & Scanlon, 2004). Even in today's society, due to insufficient understanding of reading disabilities and the absence of objective assessment instruments in China, at-risk children are easily overlooked (Ho, 2003). Recent research in reading Chinese suggested that deficits in phonological awareness, morphological awareness, speeded naming, and visual/orthographic skills distinguish dyslexic readers from normal readers (Ho, Chan, Tsang, & Lee, 2002).

The accumulating evidence that reading disabilities are prevalent among Chinese-speaking children indicates an urgent need for a high-quality intervention to prevent reading failure. To bridge the gap in the literature, this article describes an initial attempt to provide a customized early reading intervention program to an at-risk Chinese child.

CHINESE ORTHOGRAPHY AND LEARNING TO READ

Scripts vary in the extent to which they represent phonological and morphological information. According to DeFrancis (1989), Chinese represents more nearly the morphological endpoint of the world's writing systems, whereas English occupies a position midway between the phonological and morphological endpoints. Chinese has a morphosyllabic writing system in which the basic unit, character, represents a morpheme as well as a syllable. Reading Chinese depends on somewhat different insights and skills as compared to reading alphabetic scripts. The Chinese writing system does not represent speech phoneme-by-phoneme; instead, whole syllables are associated with characters. Segmentation of spoken words into syllables is intrinsically easier than segmentation of spoken words into phonemes because syllables are far more salient and easy-to-manipulate units than phonemes (Treiman & Zukowski, 1991). Thus, phonological awareness at phonemic level is less stressed in learning to read Chinese than in learning to read an alphabetic script (Tan, Spinks, Eden, Perfetti, & Siok, 2005).

Each Chinese character corresponds to a morpheme, the smallest unit of meaning in a language; therefore, morphological awareness is a basic insight that is certain to be important for Chinese reading (Shu, Chen, Anderson, Wu, & Xuan, 2003). Furthermore, unlike English morphemes which can undergo substantial changes in pronunciation and spelling in different contexts (pronounce > pronunciation; long > length); when combined to form words and phrases, Chinese morphemes seldom change in pronunciation when spoken and never change in visual appearance when written (Nagy et al., 2002). Since Chinese contains thousands of morphemes sharing only 1,200 syllables, Chinese contains an extraordinarily large number of single-syllable homophones. Every syllable has many different meanings. A Chinese child who does not consistently pay attention to morphological information is at risk of constantly being confused by all these homophones.

Chinese characters are formed in several ways (Shu et al., 2003). About 72% of the characters in school Chinese are semantic-phonetic compound characters composed of two parts: a semantic radical that gives a clue to the meaning of the character, and a phonetic radical that provides a clue to pronunciation. For example, the character 妈/mā/ (mother) consists of the radical 女 (female) and the phonetic 马/mǎ/. Written Chinese contains about 200

semantic radicals and 800 phonetic radicals (Hoosain, 1991). Chinese compound characters are formed from combination and recombination of these components. Most semantic radicals and phonetic radicals, in addition to being components of compound characters, are simple characters themselves with an independent meaning and pronunciation. A smaller number of semantic radicals and phonetic radicals are bound forms.

Learning to read English requires the understanding that there are systematic and predictable relationships between written letters and phonemes. Knowing the graphophonemic relationships in English helps children decode new words and recognize familiar words (Armbruster, Lehr & Osborn, 2003). The overarching graphophonological insight in Chinese has been termed *phonetic awareness* (Shu, Anderson, & Wu, 2000) or *orthography-phonology correspondence rules* (Chen, 1993; Ho & Bryant, 1997). Phonetic awareness is the understanding that the phonetic component of a compound character gives a clue to the syllable associated with the character in spoken Chinese.

To recapitulate, the Chinese script is morphosyllabic in that each character, the basic unit of the Chinese writing system, simultaneously represents both a morpheme and a syllable. Although phonemic awareness is necessary when reading alphabetic scripts, it is less stressed in reading Chinese because Chinese characters are learned by mapping each syllable to its written form. Whereas the clues to pronunciation in the Chinese writing system are often inconsistent, clues to meaning in Chinese are plentiful and usually transparent.

THE CHILD SELECTED FOR EARLY READING INTERVENTION

The child selected to receive one-on-one tutoring was Ming, a first-grade student enrolled at an elementary school in Dalian, a city in the northeast of China. Ming, an only child, came from a working-class family. Three generations of his family lived in a small two-bedroom apartment. The apartment was crowded and there was no space for a desk for Ming to do his homework. Ming's mom, a community college graduate, was busy with her work and seldom read with her son. His dad, who worked in another city, came home only once a month. Ming's grandparents looked after him. Since his grandparents are illiterate, they could not help Ming with his school work. The researcher noticed that literacy-related activities seldom occurred in this family. Ming had a few old and broken children's books that were not at his independent reading level.

Overall, Ming was a happy child and very polite. He was curious and liked school, but did not enjoy reading class. In an interview with Ming's reading teacher at the end of his first school year, she indicated that Ming was not meeting grade-level expectations. To avoid having Ming retained in the first grade, his parents agreed to cooperate with the researcher and allow Ming to be tutored for 1 hour per day during his summer vacation.

Ming is one of the children the authors followed for 2 years in a longitudinal study that involved 87 Chinese kindergartners. Participating children were tested at age 5 and again about 2 years later at the end of first grade on nine measures designed to capture the spectrum of metalinguistic, linguistic, and cognitive abilities that Chinese-speaking children are believed to need when they begin the process of literacy acquisition (see Wang, 2005). A brief description of each of the kindergarten measures follows. Cronbach's alpha, a lower bound estimate of reliability, was calculated to check for internal consistency within a single test. Test-retest reliability is reported for the speeded naming task.

Phonological awareness was assessed with the syllable reversal, onset/rime deletion, and tone discrimination tests. The *syllable reversal* task, which requires a child to orally reverse the order of the syllables in two- to four-syllable words, measures Chinese children's phonological awareness at the syllabic level (see Li, Anderson, Nagy, & Zhang, 2002). For example, /zhí shēng fēi jī/ (直升飞机 [helicopter]) is /jī fēi shēng zhí/ when the syllables are reversed. This task includes 12 items. The reliability (Cronbach's alpha and hereafter) was 0.90.

The *onset deletion* and *rime deletion* tasks require a child to delete the onset or rime of a syllable and say aloud the remaining part (Muter, Hulme, Snowling, & Taylor, 1998; Li et al., 2002). These tasks measure Chinese children's phonological awareness at the onset/rime level. For example, the syllable /chéng/ is /éng/ after the onset /ch/ is removed; and the syllable /chéng/ is /ch/ after the rime /éng/ is taken away. Both tasks include 10 items. The reliability coefficients for these two tests were 0.94 and 0.90, respectively.

The *tone discrimination* task, which requires a child to judge whether pairs of syllables share the same tone, measures Chinese children's phonological awareness at the tone level (Li et al., 2002). For example, the syllables in the word /cháng chéng/ (长城 [Great Wall]) have the same tone whereas the syllables /niú naī/ (牛奶 [milk]) have a different tone. There are 10 items for this task. Its reliability was 0.84.

Morphological awareness was assessed with the *morpheme discrimination* task developed by Ku & Anderson (2003). It requires a child to distinguish orally from three words that share a homograph character, the one that has a different meaning from the other two. For example, 信/xìn/ is the homograph in 信箱 [mailbox], 信封 [envelope], 信心 [confidence], but 信 in 信心 [confidence] is unrelated in meaning to the other two words. Therefore, 信心 is the desired answer. There are 10 items in this task. The reliability coefficient for this task was 0.65.

The *speeded picture naming* task, a modified version of Elbro's (1990) task, which asks the child to name the objects depicted in a set of pictures as quickly and accurately as possible, measures children's speed and automaticity in retrieving familiar names. The names of the objects in the pictures range from one- to three-syllable words, and are within the vocabulary of 5-year-old

Chinese-speaking children. The test had two trials consisting of 10 test items. In the first trial, the 10 pictures were randomly presented in one row. The child was asked to name the pictures as quickly as possible. The 10 pictures were then shuffled and presented again. The child was given the second trial. If the child failed to name a picture, misnamed a picture, or took longer than 15 seconds to name the items on the card, the data from that item were disregarded. The individual score was the average naming time of two trials in seconds. The test-retest reliability was 0.75.

Phonological distinctness was assessed with a pronunciation task, modified from Elbro (1990). It used Chinese words to measure the child's ability to distinctly pronounce the inner syllables in compound Chinese words. The child was shown a hand-held puppet, a cute alien named Bing Bing, and was told that, because he was an alien, the puppet had some difficulties with the Chinese language and did not pronounce words well. The experimenter showed an object and pronounced its name the way Bing Bing usually says it. The pronunciation was at a level of distinctness below the level for the least distinct child. The child's task was to correct Bing Bing's mispronunciations. The words selected for the task were all within the active vocabularies of 5- and 6-year-old Chinese children. The accuracy score was based on standard pronunciation of Mandarin Chinese. There were 12 items. The reliability was 0.90.

The *listening comprehension* task was adapted from a test developed by Nielsen (1993). For each item, the test administrator read a sentence. The child was presented with five pictures and was required to select the one that best represented the meaning of the sentence. The selected items ranged in difficulty from simple sentences (10 characters) to complex sentences (30 characters). There were 20 items. The reliability was 0.71.

The Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981) was used as a model for the *oral vocabulary* task. The child was shown panels of three pictures, the test administrator named one of the pictures, and the child was asked to point to the picture that matched the word said by the test administrator. There were 32 items. The reliability was 0.60.

Table 1 shows Ming's test scores at age 5 in comparison with the mean of the longitudinal study cohort and his percentile ranking among the 87 participants. Percentile rank is calculated to identify the percentage of a child's peer group (in this case, the longitudinal study cohort) that a child's score surpassed.

Compared to his peers, Ming had about average listening comprehension at age 5, an adequate grasp of concepts associated with printed text, and had developed adequate tone awareness. Tone awareness is a phonological insight that is implicated in learning to read Chinese. Since every syllable in Mandarin Chinese is differentiated with a tone, or pitch contour, it is to be expected that a child who cannot or does not pay attention to tone will often be confused.

However, as Table 1 shows, Ming had limited oral receptive vocabulary knowledge and he performed below average on almost all the phonological

Table 1. Summary of Ming's Screening Test Scores at Age 5 in Comparison with His Peers

Kindergarten Measure	Mean (n = 87)	Ming	Percentile Rank
Listening Comprehension	0.83	0.90	75
Tone Discrimination	0.55	0.60	69
Morpheme Discrimination	0.62	0.50	39
Oral Vocabulary	0.88	0.81	16
Speeded Picture Naming	16.1 secs	17.4 secs	36
Syllable Reversal	0.56	0	7
Rime Deletion	0.27	0	7
Onset Deletion	0.04	0	9
Phonological Distinctness	0.95	0	1

Note: Except the picture-naming speed task which scored as the total time needed for naming the set of pictures, scores are scaled as proportions which means that the maximum possible score is 1.0 and the minimum possible score is zero in most cases.

processing measures (syllable reversal, onset/rime deletion, and speeded picture naming) and a measure of morphological awareness (morpheme discrimination). He exhibited poor-quality phonological representations, which is to say he had indistinct speech and distorted the inner syllables of compound words.

At age 5, Ming could not perform phonological awareness tasks at either the syllable level or the onset/rime level. He scored 0 on all three tasks, and his test scores were at 7th, 7th, and 9th percentile, respectively, using the longitudinal study participants as the norm group. Chinese children with dyslexia have been found to perform worse than children without dyslexia on phonological awareness tasks at the onset and rime level (Ho & Lai, 1999; Ho, Law, & Ng, 2000). The syllable reversal task measures children's verbal short-term memory. In order to reverse the target word, the child needs to segment the word into its constituent syllables, and hold the syllables in memory for a short while in order to reverse them one by one. Ho et al. (2000) suggested that a verbal working memory deficit is one of the prominent problems faced by Chinese children with dyslexia. Stevenson and his colleagues demonstrated that poor Chinese readers made more errors in memory for words than did the typically achieving children (Stevenson et al., 1982).

Ming also exhibited poor-quality phonological representations at age 5. Several researchers have speculated that the quality of the phonological representations of words might be important for vocabulary development and

reading. Low-quality representations have been described as poor, incomplete, imprecise, and faulty (Elbro, 1998; Fowler, 1991). At age 5, Ming displayed a low quality of phonological representation; he was less able to distinguish between speech contrasts, repeat, and produce phonologically complex and unfamiliar words as compared to his peers. Problems in establishing clear and precise phonological representations in long-term memory have frequently been mentioned as a possible unifying cause of the diverse difficulties among alphabetic readers with dyslexia (Fowler; Snowling, Van, & Stafford, 1988).

Moreover, Ming took 17.4 seconds to name all the stimuli in the speeded picture naming task, which was slower than the mean of 16.1 seconds (see Table 1). A rapid naming deficit has been found to be associated with reading difficulties in various languages, including Chinese (Bowers & Wolf, 1993; Ho et al., 2000). Ming performed poorly on the morpheme discrimination task; his test score was at the 39th percentile (see Table 1). Deficits in morphological awareness may be an important contributor to reading problems among Chinese children. Shu, McBride-Chang, Wu, and Liu (2006) suggested that morphological awareness is one of the best tests for whether Chinese children are dyslexic. In light of the existing literature, we predicted that Ming would experience reading difficulties in his early school years.

The prediction that Ming might be at risk was confirmed by his later school performance. At the end of the 2-year longitudinal study, the researcher revisited Ming, now age 7, at his school. His school records showed that Ming was struggling in all core subject areas (Chinese, English as a foreign language, and mathematics). His teacher confirmed that he was one of the poorest readers in his class, and strongly recommended that Ming receive the reading intervention program we were creating.

PRETUTORING ASSESSMENTS

Before tutoring, Ming was assessed in three different ways to evaluate his literacy level. Firstly, as one of the participants in the longitudinal study, Ming received a battery of tests at the end of the first elementary school year. The tests measured character knowledge, vocabulary knowledge, reading fluency, reading comprehension, and visual-orthographic ability. Table 2 displays Ming's reading scores at the end of the first grade in comparison with the mean of the longitudinal study participants, as well as his percentile rank in comparison with the other students within the longitudinal study cohort.

The *copy character* task assesses the child's awareness of the visual structure of Chinese characters. Children with greater insight into the internal structure encode characters in terms of chunks representing major character components, and thus learn to read Chinese more easily (Shu & Anderson, 1998). A total of 20 characters were presented one at a time for 2 seconds and then taken away.

Table 2. Summary of Ming's Reading Scores at Age 7 on End-of-First-Grade Measures

Measure	Mean	Ming	Percentile Rank
Copy Character	0.86	0.93	63
Vocabulary	0.67	0.40	1
Chinese Character Reading	66/100	39/100	7
Fluency	127.5 wpm	114 wpm	25
Reading Comprehension	0.88	0.70	7

Children were asked to concentrate on each character while it was in view and then, after it was removed, to write it on an answer sheet. The reliability coefficient for this task was 0.72.

In the *Chinese character reading* task, 100 Chinese characters were arranged in ascending order of difficulty, with 40 characters from first-grade textbooks, 30 characters from second-grade textbooks, and 30 characters from third-grade textbooks. The child is asked to read the characters aloud one-by-one. The task is discontinued when the child fails to read 10 consecutive characters. The reliability of this measure was .94.

The *vocabulary* task uses the multiple-choice format; the experimenter read aloud a character, and followed by a sentence that contains the target character. The child is presented with four characters, a meaning-based distracter, a sound-based distracter, a visual distracter, and the correct answer. The reliability of the vocabulary measure was 0.70.

The *reading fluency* task requires the child to read aloud a paragraph as quickly and accurately as possible. Two paragraphs were selected from stories children had not read in school, with almost all characters familiar from the first-grade textbooks and a few unfamiliar compound characters with familiar phonetic components. The first paragraph had simpler grammar and more-repetitive sentence structure than the second one. This is an individual task and the score is the average number of characters read correctly in one minute. Its reliability was 0.95.

The *reading comprehension* task was adapted from Nielsen (1993). For each item, the child read a sentence, and then selected from five pictures the one that best represented the meaning of the sentence. The selected items ranged in difficulty from simple sentences (10 characters) to complex sentences (30 characters). The reliability coefficient was 0.42, due to a performance ceiling. The task was too easy for this sample of children.

As shown in Table 2, Ming scored far below average on all the reading measures, except the copy character task that is designed to detect awareness of the internal structure of Chinese characters.

Secondly, we looked at Ming's performance on the Test of Basic Skills (TBS). The TBS is a summative assessment created by local education authorities and given annually to evaluate student yearly progress. It covers three subject areas: reading, mathematics, and English. TBS reading test measures students' word identification skills and reading comprehension. Based on TBS scores, we can compare one child's performance with what might be normally expected of other children in that school. We used the school's TBS scores as a benchmark due to the fact that in China, the average scale scores for the nation or for provinces are not available for comparison.

Table 3 displays Ming's end-of-first-grade TBS scores in Chinese reading, English as a foreign language, and mathematics, in comparison with his class and the entire first-grade cohort in his school. Ming's TBS reading score was well below proficient. Ming's reading score was at the 4th percentile, using his classmates as the norm group, and at the 2nd percentile when using all first-grade students in his school as the norm group. Reviewing his TBS performance, Ming's teacher said that he was below basic in reading comprehension and was weak in both word analysis and comprehension strategies. According to his teacher, Ming also struggled with *pinyin* — an alphabetic script that Chinese children learn early in the first grade as an aid to learning character pronunciations. Poor pinyin skill could hinder a child learning new characters.

Thirdly, to further pinpoint Ming's strengths and weaknesses as well as to inform reading instruction, Ming's reading and writing skills were assessed with a set of formative assessments. Due to the fact that published diagnostic assessments for guiding Chinese reading instruction are scarce, the researcher designed/adapted four assessments, inspired by Marie Clay's (2002) Observation Survey, to serve this purpose.

Table 3. Ming's End-of-First-Grade Scores on the Tests of Basic Skills

Subject	Ming	Mean Ming's Class	Ming's Percentile Rank	Mean All First Graders	Ming's Percentile Rank
Chinese	49.5	86.1	4	85.4	2
English	73	92.7	13	92.2	13
Math	78	92.7	7	91.2	9

Note: The maximum possible score is 100 and the minimum possible score is zero for the subtests of the Test of Basic Skills.

The Word Test measures a child's ability to recognize the most frequently occurring words. The words are divided into three levels, roughly corresponding to grade levels from kindergarten to second grade; then into groups of 15 words, according to difficulty and frequency (see Appendix A). Ming was given a list of practice words, and then asked to read a word list in kindergarten level. He read 10 words correctly.

For the Writing Vocabulary task, Ming was asked to write as many known characters as possible in 10 minutes. He was given a blank piece of paper and a pencil, and told, "I want to see how many characters you can write. Can you write your name?" Ming wrote for a few minutes on his own. When he stopped, the researcher prompted him in various ways to write other characters that the children of his age might know. Examples of the prompts include other children's name, things people do, things in the home, things people eat, things people ride in, and high-frequency words. This task is scored by assigning one point for every character that is correctly written. Ming wrote 57 characters in 10 minutes, of which 50 characters were correctly written. Most of the characters he wrote were simple characters, such as 刀/knife, 人/people, 门/door, 木/wood, 火/fire.

The Hearing and Recording Sounds in Words (Dictation) task required Ming to write a dictated sentence. The objective is to determine if he can hear each separate speech sound in spoken words and write an acceptable character for evidence that he has heard this sound. Being able to hear the sounds in the words he wants to write is an authentic task. Furthermore, by observing the child as he writes, the researcher can get clues to what he understands about print, messages in print, and what features of print he is attending to. Two alternative Chinese sentences were prepared for this task. The researcher read a sentence to Ming and then repeated each word in the sentence one at a time, instructing Ming to say the words slowly and write them character by character. Verbal prompts were provided, if needed. Ming was required to write down the sentence in both Chinese characters and pinyin. In scoring the task of character writing, one point was awarded for each character (n=38) Ming recorded in a way that is acceptable in Chinese. In scoring the task of pinyin writing, one point was awarded for each syllable (n=114). Ming correctly wrote 24 characters, he struggled with most of the compound characters (such as 校/school, 玩/play). For pinyin dictation, Ming misspelled 16 syllables; he confused *en* and *eng* sound most of the time. The nasal consonant sound /n/ presented a great difficulty for Ming.

Developed by Marie Clay, the originator of Reading Recovery, a running record is a method for the teacher to record a child's independent reading behavior while the child orally reads a text.The observer records the child's reading using a kind of shorthand error recording technique (Clay, 2002).

Running records were adapted and used to provide a way for the researcher to quickly and easily assess Ming's Chinese reading behavior "on the run." As Ming read a portion of a book, the researcher noted errors, self-corrections, repetitions, rereadings, hesitations, insertions, omissions, and appeals for help. Running records allowed the researcher to gauge Ming's reading progress over time, and to determine if a given book was at an appropriate level for him.

The calculation of accuracy, self-correction rate, and error rate for running records of Chinese reading was based on characters rather than words. In Chinese, character and word are different concepts. A character is a written unit separated by a space on each side. Basic words may be one character in length but many words consist of two or more characters. For example, 这里是热带雨林 [This is the tropical rain forest] consists of seven characters but four words.

The sample from Ming's running record (see Figure 1) showed that, at the time tutoring began, he relied on some visual information from the print. But he was not always paying attention to sentence structure. His errors often did not belong to a class of words which could occur in the sentence up to the error. For example, 睁[open] is a verb; while 净[clean] is an adjective, and he did not react to the lack of meaning in what he said.

Overall, Ming's oral reading indicated that he knew a number of sight words and that he attempted to read unfamiliar words using the subcomponents of Chinese characters, which is a desirable reading strategy. For example, Ming recognized that both characters 睁/open and 净/clean share the same subcomponent of 争, he used his knowledge of character 净 to sound out the unknown character 睁 in his reading. However, he often read items aloud in a way that did not make sense, but seldom stopped to self-correct. It seems Ming did not consistently use meaning cues. For example, Ming confused visually similar characters such as 挑 [select] and 跳 [jump], 锐 [sharp] and 脱 [take off], but failed to reread or self-correct when what he read did not make sense. Ming read slowly and word by word. His oral reading was choppy and plodding.

To recapitulate, at the end of the first grade, Ming was at risk for failing to learn to read Chinese. He was below basic in reading comprehension and was weak in both word analysis and comprehension monitoring. His oral reading lacked fluency. His oral reading errors frequently did not make sense.

CUSTOMIZED LESSONS DESIGNED FOR MING

Based on Ming's strengths and weaknesses in reading and writing, a customized tutoring program was designed to meet his learning needs. The tutoring session included (a) easy reading, (b) shared book reading, and (c) writing activity. An additional component was a daily mini-lesson on character decoding, charac-

Figure 1. Sample of Ming's Running Record for *Who Has Time for Little Bear?*

谁有时间理小熊？
Who Has Time for Little Bear?
小熊在洞口高兴地又唱又跳。
Little Bear danced and sang in front of the den.
熊爸爸和熊妈妈也出来了。
At last Papa Bear and Mama Bear came outside.
春天的阳光照得他们睁不开眼睛。
They squinted into the light.
他们觉得暖和极了。
The spring sun warmed their fur.

(Accuracy 91.2%)

Page	Title: 谁有时间理小熊？ *Who Has Time for Little Bear?*	Count E	Count SC	Analysis of Errors and Self-corrections — Information Used E MSV	Information Used SC MSV
2	√ 熊/bear √ √ √ √ √ √ √ √ 跳/jump 能/able 挑/select	2		M S Ⓥ M Ⓢ Ⓥ	
	√ √ √ √ √ √ √ √ √ √				
	√ √ √ √ √ √ √ √ 睁/open √ √ √ √ 净/clean	1		M S Ⓥ	
	√ √ √ √ 暖/warm √ √ √ 缓/slow	1		M Ⓢ Ⓥ	

ter and word structure, or comprehension strategies. Lessons were crafted to increase in difficulty when Ming was ready for greater challenge and were flexibly adapted to meet Ming's moment-by-moment needs based on his responses during the lesson.

Ming's lessons were developed and delivered by the reading researcher (the first author) who conducted the present project. The tutor was trained by a professor in special education at University of Illinois on one-on-one tutoring and worked as a tutor at a local elementary school in Illinois to teach a first-grade child who was at risk for failing to learn to read.

Easy Reading

For 5 to 10 minutes at the beginning of every tutoring session, Ming read materials that were easy and familiar. Doing so helped Ming use what he already knew to decode text and refine strategies he had learned previously. Rereading familiar texts also allowed Ming to notice word and sentence patterns and discover new ways of decoding words and making meaning. For example, when rereading a funny poem, Ming figured out the word "沙漠" means *an area without water* in 龙虾走沙漠 [The lobster walks in the desert] by referring to the previous line 骆驼游大海 [The camel swims in the ocean]. He, then, used the phonetic component 莫 to figure out the pronunciation of the character 漠 /mò/ and guessed that 沙漠 must read as /shā mò/ and means *desert*. Ming read predictable books for easy reading. Sometimes he was given a choice of the stories he would like to read. Other times, the story was chosen by his tutor. Research has shown that rereading familiar text builds sight vocabulary and fluency, and boosts the student's self-confidence (Pinnell et al., 1990). To begin the tutoring session with a successful reading experience greatly increased Ming's willingness to engage in the more challenging activities that followed. A running record was taken as Ming reread the book introduced in the previous tutoring session.

Introducing a New Book by the Shared Book Approach

After easy reading, the tutoring session moved to a shared book reading of a new text. The shared book reading approach was designed by Holdaway (1979, 1980) as a way for a teacher to engage children in reading connected text, replicating the enjoyable book-sharing experience that many parents create when they read books with their children. Shared book reading allows children to enjoy reading materials (with a teacher's gentle guidance) that they may not be able to read on their own. Thus, shared book reading is an interactive reading experience that goes beyond simply listening to an enjoyable story because children's attention may be drawn to concepts about print, to pair what they hear with what they see, and to develop the sense that the print carries one precise message that shows up in a word-by-word match (Burns, Griffin, & Snow, 1999; Clay, 1995; Holdaway, 1979). In shared book reading, children participate in reading, learn critical concepts of how print works, get the feel of learning and begin to perceive themselves as readers (Anderson et al., 2002; Fountas & Pinnell, 2001; Holdaway, 1979, 1980).

The shared book approach has been successfully adapted and implemented in Chinese classrooms since the late 1990s (see Anderson et al., 2002). Shared book reading contrasts sharply with conventional reading instruction in China,

which is based on a long tradition of intensive reading of limited amounts of text using drill, practice, recitation, and memorization (Wu, Li, & Anderson, 1999). The shared book approach has been found to increase the volume of reading, enhance vocabulary learning, and maintain children's interest and engagement at a high level (Anderson et al.; Zhu et al., 2010).

A shared book reading session may be conducted in many ways, depending on the needs of the child and the teaching objectives. Other considerations for implementing the Shared Book approach were the need to accommodate the traditional ways of teaching reading in China, and to be responsive to the culture in terms of book selection. A shared book reading session designed for Ming could be divided into three sections: before, during, and after reading.

Before the session

The session usually began with a 'picture walk' in which the tutor guided Ming through a preview of the story. During this process, the tutor first introduced the story, commenting on the picture on the cover of the story, then read the title with exaggerated enunciation, pointing to each character as she read. Once in a while, the tutor directed Ming's attentions to the pictures to get an idea of what the story was about, or asked questions to elicit words and phrases that are used in the text. After going through all of the pages of the book, Ming was allowed a quiet minute to think about the story. Sometimes, the tutor briefly pointed out specific character actions or events, and/or asked probing questions to engage Ming in thinking about the pictures and story.

During the session

The book was usually read to Ming and predictions were checked against the text of the story. For the first reading, the tutor read slowly, clearly, and expressively, pointing to each character as it was read and using intonation to make quoted speech stand out. Ming was asked to follow along with his eyes. Occasionally, the tutor broke the reading briefly to make a connection between the written text and an illustration. The story was then read several times until Ming could read well and with some expression. The second and subsequent readings allowed for Ming to chime in with now familiar words and phrases. In some cases, the tutor read one page and Ming read the next page, taking turns for the whole book; or they read the whole book in unison.

After the session

This section focused on further comprehension of the story. Activities included (but were not limited to) retelling; questioning and discussion of the story; acting out the story; reviewing elements of the story (setting, characters, problem, solution); and putting pictures of events of the story in order.

Mini-Lesson Emphasizing the Structure of Chinese Characters and Words

The focus of this teaching session was on word identification and cultivating the disposition to read for meaning. As mentioned in the previous section, Chinese characters provide limited and not altogether reliable information about pronunciation, especially for struggling and beginning readers (Anderson et al., 2002). However, Chinese is rich in morphology, and morphological information in Chinese is usually transparent and reliable. Morphological instruction focused on promoting children's morphological and graphomorphological awareness. The rationale behind morphological instruction came from the nature of Chinese characters and words. Over 70% of school Chinese characters are semantic-phonetic compounds (Shu et al., 2003). The rest are pictographs or ideographs, in which the graphic form of the character suggests its meaning.

Morphological instruction was designed to teach graphomorphological analysis of characters and morphological analysis of words, and to cultivate the application of such knowledge when a child encountered new characters and words. Morphological instruction consisted of direct instruction and guided discovery to explicate the shape-to-meaning connections in pictographs and ideographs, the function of the phonetic and semantic radicals to the pronunciation and meaning of compound characters, and the contribution of component characters to the meaning of two- and three-character words (see Wu et al., 2009). The following example demonstrated how to use the function of the phonetic and semantic radicals to the pronunciation and meaning of compound characters:

Tutor: (points at the word 蜻蜓 [dragonfly] and asks Ming to observe the strokes and the order in which they are written) Of which parts is the character made up?
Ming: (looks puzzled)
Tutor: What's on the left-hand side of each character?
Ming: 虫
Tutor: What does 虫 mean?
Ming: Insect
Tutor: What's on the right-hand side of each character?
Ming: 青/qīng/and 廷 /tīng/? (looks back at the pictures (looking up at his tutor) 蜻蜓/ qīng/ /tīng/, dragonfly (with a big smile).

Writing Activities

Because reading and writing are based on the same system of printed words, learning to write supports the process of learning to read. In a typical Chinese elementary classroom, writing is taught 1 day a week. Handwriting and the mechanics of writing take the lion share of writing instruction. Students once in a while are required to write a composition on a topic assigned by the teacher to an entire class of 40 or more students. Assigning topics ignores individual students' interest and motivation; the teacher can't expect every one of her/his students to be excited about the same topic. It's not surprising that Ming "hates" writing class in school.

To foster a love for writing and feeling successful as a writer, the topics selected for writing were matched to Ming's interests and, where possible, involved a genuine purpose and a real audience. For example, Ming's favorite basketball player is Yao Ming. He always wanted to write a letter to Yao requesting a signed autograph. Before teaching Ming how to write a letter, the tutor shared a letter she wrote to an author requesting a signature on the book that the author recently published. Then, Ming was encouraged to brainstorm the topics to be included in the letter. Ming was encouraged to write the initial draft without worrying about the mechanics of writing. The tutor helped Ming edit and revise the draft once. Ming copied the letter on a postcard and mailed it to Yao. Ming was excited and eager to write throughout the whole process.

To promote the development of writing skills, the tutor used the 'writing aloud' strategy. Writing aloud made the tutor's thinking visible while composing and scribing in front of Ming. Ming observed the demonstration of how writing works — planning, thinking, drafting, organizing, selecting words, forming characters, punctuating and formatting to name a few.

At the beginning of the tutoring sessions, Ming relied heavily on drawing pictures or using pinyin in composing his message (see Figure 3, "Who will be my friends?"). The tutor used sharing writing to compose collaboratively, during which the tutor acted as expert and scribed for Ming as she demonstrated, guided, and negotiated the creation of meaningful text, focusing on the craft of writing as well as the conventions. Shared writing built on what the tutor had already been modeling through writing aloud; it is an excellent way to model quality writing and a very effective way to teach concepts of print (Mckenzie, 1985; Routman, 2000).

Ming received tutoring for 7 weeks, 5 days a week, and about 1 hour a day. It might have been desirable to conduct shorter daily sessions over more weeks, but that was impossible in the present case study because of time constraints.

MING'S PROGRESS

At the end of the seventh week of tutoring, Ming's Chinese reading and writing ability were assessed again. Table 4 illustrates Ming's progress as measured by comparing his performance on the formative assessment before and after tutoring.

The writing vocabulary posttest showed that Ming had made noteworthy progress in written vocabulary. Before tutoring, Ming attempted 57 characters and wrote 50 of them correctly. After tutoring, he easily wrote 99 characters within 10 minutes with only two errors. He wrote more-complex characters (e.g., 请, 然) during the posttest rather than just simple characters (e.g., 山, 一) that predominated in the pretest. Running records indicated that Ming's read-

Figure 2. Sample of Ming's Running Record for *Mice Daughter*

老鼠嫁女儿
Mice Daughter
从前有个老鼠村，
Once upon a time, there was a mouse village,
村里有个老村长，
In mouse village, there was a village head,
村长有个美丽的女儿要出嫁。
He wanted to marry his beautiful daughter (to the greatest person in the world).

(Accuracy 90%)		Count		Analysis of Errors and Self-corrections	
				Information Used	
Page	Title: 老鼠嫁女儿 *Mice Daughter*	E	SC	E MSV	SC MSV
1	√ √ √ √ 老鼠 林/forest R | SC 村/village		1		M (S) (V)
	√ √ √ √ √ √ √				
	√ √ √ √ 漂亮 /pretty √ √ √ √ √ √ 美丽/beautiful	2		(M) (S) V (M) (S) V	

Table 4. Ming's Formative Assessment Scores Before and After Tutoring

Task	Before Tutoring	After Tutoring
Word Reading	10	14
Writing Vocabulary	50	97
Dictation		
Characters	24	25
Pinyin (syllables)	98	111

ing had improved substantially. He was able to read longer and more-difficult stories (see Table 5). He read more fluently, and though he still made mistakes during reading, his errors reflected the use of meaning and sentence structure. The error analysis indicates that Ming employed a wider range of strategies. He paid attention to visual details and he could self-correct discrepancies between his response and the words on the page (see Figure 2).

Ming also benefited from explicit instruction in morphology. Before tutoring, Ming seldom tried to decode an unknown character/word; he just stopped reading wherever there was an unknown word. After tutoring, he could identify the semantic and phonetic components of a new compound character and

Table 5. Comparison of Running Records in First Week and Seventh Week of Tutoring

	Total Words Read		Errors		Self-Correction		Accuracy	
	Week 1	Week 7	Week 1	Week 7	Week 1	Week 7	Week 1	Week 7
Text Level								
Easy	196	1,284	8	29	3	10	96%	97%
Instructional	225	397	13	24	0	9	94%	94%
Difficult	180	*NA	19	*NA	0	*NA	89%	*NA

Note: Easy = late kindergarten through middle fist grade; Instructional = middle to end of first grade; Difficult = second grade

*Ming read all 45 little books we compiled for the research project. None of them was at his difficulty level at the end of the tutoring. We were sure that Ming could read beyond the beginning second-grade level, but could not decide where he was exactly because we ran out of the reading materials for him.

could often figure out its pronunciation and meaning. He could figure out the meanings of new words from their constituent characters. For example, when he came to the character 鲤 while reading the sentence 袋鼠输给小鲤鱼 [the kangaroo lost to the little catfish in a swimming competition], Ming looked at the character 鲤 and then he looked up at the picture. He looked back at the character and said 鱼 [the component on the left side of 鲤] means fish, and 里 [the component on the right side of 鲤] is pronounced as /lǐ/. He said "lǐ yú/catfish?" and looked up and smiled at his tutor.

Ming made progress in writing (see Figure 3). Before tutoring, Ming drew pictures to fulfill writing tasks. When asked to read his text, he responded with a clear story indicating that he recognized that drawing is an illustrative form, but still continued to use drawing when asked to write. By the end of tutoring, Ming relied less on drawing and seldom used pinyin in place of Chinese characters. Figure 3 contains a sample titled "My Mom" of Ming's writing during the sixth week of tutoring. Both his parents and his teacher reported that he now enjoyed writing. They said that his stories were full of imagination and that he used vivid descriptive words.

After tutoring, Ming frequently wrote in his journal as a way to communicate with his parents. His language skills grew and his confidence and competence in writing increased. The tutor observed that Ming used writing strategies such as reread, rethink and revise, thinking about what to say and how to say it, using interesting and lively language, and crafting a beginning sentence to engage the reader. Ming wrote the majority of words in the correct form. He made use of information in the distinct parts that constitute a character to encode words in print. He understood the functions of the radical and phonetic parts of characters and other language conventions. He used characters and words in his writing that he had encountered in his reading.

Reading was no longer a headache for Ming. His mom reported that Ming was eager to read his favorite stories to his family once he got home. He was more willing to work on his homework and enjoyed a quiet time reading stories after dinner. When the tutoring sessions had ended, he asked his mom to send him back to tutoring and said it was his happiest time to read the stories we prepared for him.

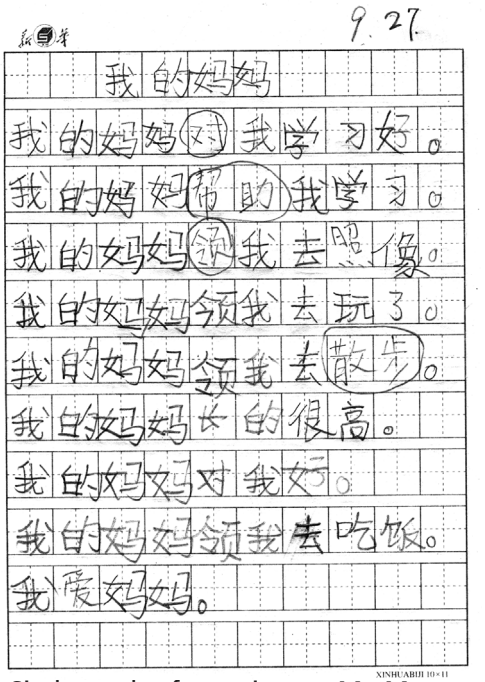
Back in his classroom, the researcher noticed that Ming was now often eager to answer his teacher's questions, and that he usually followed instructions to complete assigned school activities. He paid attention to the teacher, though he still got distracted easily.

REFLECTIONS ON THE TUTORING PROGRAM FOR MING

Although we do not yet know the conditions that must be in place to prevent reading difficulties in all Chinese children, this study may provide insight into what can be done to prevent reading failure of some Chinese children who fail

Figure 3. Sample of Ming's Writing

First week of tutoring — *Who will be my friend?*



Sixth week of tutoring — *My Mom*

to acquire adequate reading and writing skills during the primary grades of elementary school.

Firstly, the intensive one-on-one tutoring program provided Ming — a low-achieving reader, with needed practice, feedback, and support. In a typical first-grade classroom in northeast China, with a 1:40 teacher-student ratio, whole-class teaching, and only 90 minutes of reading instruction a day, there is little time available for any individual child to read aloud under the teacher's direct guidance. This lack of guided reading time is problematic for low-achieving readers such as Ming, who desperately need practice in a situation where support is available. Struggling beginning readers specifically require help when trouble such as an unknown word arises and reassurance when things are going well. They need support that promotes independence and strategic reading, which is not the strength of conventional Chinese instruction.

Secondly, the shared book reading approach adapted for Ming greatly increased his volume of reading. Previous research indicated that extensive reading accelerates growth in reading competence (Anderson, 1996; Stanovich, 1993). Increasing the volume of reading has been shown to accelerate children's vocabulary acquisition, among other benefits. This is especially true in languages such as Chinese which is low in regularity, consistency, and transparency, because the pronunciation of new words cannot be reliably predicted from principles relating speech and print. In these languages, children must become familiar with words in order to pronounce them and identify their meanings. Enough information about pronunciation is available in semantic phonetic compound characters to be very helpful for assimilating characters once the characters have been encountered in an informative context. He, Wang, and Anderson (2005) have demonstrated that Chinese children are able to use partial information about pronunciation to learn and remember semi-regular characters in experiments involving second and fourth graders. The process depends upon encountering characters in a context that conveys enough information about pronunciation and meaning and, hence, the importance of volume of reading.

Thirdly, morphological instruction appeared to help Ming learn grapho-morphological analysis of characters and morphological analysis of words and cultivate the application of such knowledge when he encountered new characters and words. Children must be strategic at the growing edge of their reading competence. Being strategic requires being aware of the design principles of the writing system. But these are not systematically taught in conventional Chinese reading and writing instruction, which instead stresses rote memorization and repetitive copying (Wu et al., 1999). A reader like Ming is likely to become dependent rather than independent, compliant rather than mindful. We believe that getting him to understand and pay attention to details of the structure of characters and words enabled him to become more independent and strategic.

Fourthly, we provided Ming with little books that he could read and wanted to read. Previous research showed that low-achieving students learn

most comfortably with materials that are written at their level, and succeed with the same frequency as good readers. To design this tutoring program, high-quality books were chosen from a set of English story books using multiple criteria and translated into Chinese. These books were captivating and worthy of being read many times. Instruction using carefully sequenced little books has been shown to be superior to the use of traditional textbooks in promoting a young Chinese child's early reading progress (Anderson et al., 2002; Zhu et al., 2010). The Chinese version of the books has vocabulary familiar to young children. Books were arranged with gradually increasing text difficulty. Other principles used to construct the books include the match between illustrations and print, the familiarity of language patterns and story episodes (Peterson, 1991), as well as rhyme and repeated phrases.

Fifthly, the writing activities for Ming made sure that writing was meaningful, not just correct. Stories were used as a springboard for teaching writing. Through 'writing aloud,' brainstorming writing topics, encouraging him to put his thoughts on paper, writing without worrying about the mechanics, and shared writing between Ming and the tutor when he struggled with spelling, writing session provided ample opportunities for Ming to work on conventions of print, the sounds in words, and how the sounds connect with characters — and, therefore, the connection between reading and writing. Writing session helped Ming understand that writing is not so much one skill as a bundle of skills including conventions of print, grammar, spelling, punctuation, and so on. Ming learned that writing could be used in multiple ways — to communicate, express, question to name a few.

Lastly, individual tutoring offered Ming repeated opportunities to return to known books, and thus orchestrated strategies for fluent reading. As he became a more-fluent reader, he had enhanced interest and increased confidence. Moreover, in the unpressured context of one-on-one tutoring, Ming demonstrated more knowledge than he was able to show initially. This further reinforced his self-confidence and prepared him for new challenges. From the teacher's report, Ming's reading skills and his self-confidence improved dramatically after the individual tutoring.

A limitation of the present study is, of course, that the findings are based on one case and, therefore, are in need of replication with other struggling Chinese readers. Another limitation is that the formative assessments modeled on Clay's (2002) Observation Survey require further validation before they can be recommended for wider use.

This paper described the development and implementation of a customized tutoring program to support an at-risk Chinese-speaking child in learning to read and write Chinese. Ming made considerable progress, suggesting that one-on-one instruction may be worthwhile for low-achieving students reading a script different from the alphabetic scripts of the West.

REFERENCES

Anderson, R. C. (1996). Research foundations to support wide reading. In V. Greaney (Ed.), *Promoting reading in developing countries* (pp. 55–77). Newark, DE: International Reading Association.

Anderson, R. C., Gaffney, J. S., Wu, X., Wang, C., Li, W., Shu, H., et al. (2002). Shared book reading in China. In W. Li, J. S. Gaffney, & J. L. Packard (Eds.), *Chinese children's reading acquisition: Theoretical and pedagogical issues* (pp. 131–156). Boston: Kluwer Academic.

Armbruster, B. B., Lehr, F., & Osborn, J. (2003). *Put reading first: The research building blocks of reading instruction* (2nd ed.). Washington, DC: Partnership for Reading, Center for the Improvement of Early Reading Achievement.

Bowers, P. G., & Wolf, M. (1993). Theoretical links among naming speed, precise timing mechanisms and orthographic skill in dyslexia. *Reading and Writing, 5*(1), 69–85.

Burns, M. S, Griffin, P., & Snow, C. E. (Eds.) (1999). *Starting out right: A guide to promoting children's reading success*. Washington, DC: National Academy Press.

Chen, Y. P. (1993). *Word recognition and reading in Chinese*. Unpublished doctoral thesis. University of Oxford, England.

Clay, M. M. (1995). *Becoming literate: The construction of inner control*. Portsmouth, NH: Heinemann.

Clay, M. M. (1998). *By different paths to common outcomes*. York, ME: Stenhouse.

Clay, M. M. (2002). *An observation survey of early literacy achievement* (2nd ed.). Portsmouth, NH: Heinemann.

Clay, M. M. (2005). *Literacy lessons designed for individuals part one and part two*. Auckland, New Zealand: Heinemann.

DeFrancis, J. (1989). *Visible speech: The diverse oneness of writing systems*. Honolulu: University of Hawaii Press.

Dunn, L. M., & Dunn, L. M. (1981). *Peabody Picture Vocabulary Test-Revised* (PPVT-R). Circle Pines, MN: American Guidance Service.

Elbro, C. (1990). *Differences in dyslexia: A study of reading strategies and deficits in a linguistic perspective.* Copenhagen, Denmark: Munksgaard.

Elbro, C. (1998). When reading is "readn" or "sothn". Distinctness of phonological representations of lexical items in normal and disabled readers. *Scandinavian Journal of Psychology, 39*, 149–153.

Fountas, I. C., & Pinnell, G. S. (2001). *Guiding readers and writers*. Portsmouth, NH: Heinemann.

Fowler, A. E. (1991). How early phonological development might set the stage for phoneme awareness. In S. Brady & D. Shankweiler (Eds.), *Phonological processes in literacy: A tribute to Isabelle Y. Liberman* (pp. 97–118). Hillsdale, NJ: Erlbaum.

He, Y., Wang, Q. Y., & Anderson, R. C. (2005). Chinese children's use of subcharacter information about pronunciation. *Journal of Educational Psychology, 97*, 572–579.

Hiebert, E. H., & Taylor, B. M. (Eds.) (1994). *Getting reading right from the start: Effective early literacy interventions*. Boston: Allyn & Bacon.

Hiebert, E. H., & Taylor, B. M. (2001). Beginning reading instruction: Research on early interventions. In M. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research volume III* (pp. 455–482). Mahwah, NJ: Erlbaum.

Ho, C. S-H. (2003). Reading acquisition and developmental dyslexia in Chinese: A cognitive perspective. In N. Goulandris (Ed.), *Dyslexia in different languages: Cross-linguistic comparisons* (pp. 277–296). London: Whurr.

Ho, C. S-H., & Bryant, P. (1997). Learning to read Chinese beyond the logographic phase. *Reading Research Quarterly, 32*(3), 276–289.

Ho, C. S-H., & Lai, D. N-C. (1999). Naming-speed deficits and phonological memory deficits in Chinese developmental dyslexia. *Learning and Individual Differences, 11*(2), 173–186.

Ho, C. S-H., Chan, D. W., Tsang, S. M., & Lee, S. H. (2002). The cognitive profile and multiple-deficit hypothesis in Chinese developmental dyslexia. *Developmental Psychology, 38*(4), 543–553.

Ho, C. S-H., Law, T. P-S., & Ng, P. M. (2000). The phonological deficit hypothesis in Chinese developmental dyslexia. *Reading and Writing: An Interdisciplinary Journal, 13*(1-2), 57–79.

Holdaway, D. (1979). *The foundations of literacy*. Portsmouth, NH: Heinemann.

Holdaway, D. (1980). *Independence in reading: A handbook on individualized procedures*. Gosford, Australia: Ashton Scholastic.

Hoosain, R. (1991). *Psycholinguistic implications for linguistic relativity: A case study of Chinese*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Institute of Education Sciences (2003). *Identifying and implementing educational practices supported by rigorous evidence: A user friendly guide*. Washington, DC: U.S. Department of Education.

Ku, Y-M., & Anderson, R. C. (2003). Development of morphological awareness in Chinese and English. *Reading and Writing: An Interdisciplinary Journal, 16*(5), 399–422.

Li, W., Anderson, R. C., Nagy, W., & Zhang, H. (2002). Facets of metalinguistic awareness that contribute to Chinese literacy. In W. Li, J. S. Gaffney, & J. L. Packard (Eds.), *Chinese reading acquisition: Theoretical and pedagogical issues* (pp. 87–106). Norwell, MA: Kluwer Academic Publisher.

Madden, N. A., Slavin, R. E., Karweit, N. L., Dolan, L. J., & Wasik, B. A. (1993). Success for all: Longitudinal effects of a restructuring program for inner-city elementary schools. *American Educational Research Journal, 30*, 123–148.

Mckenzie, M. (1985). Shared writing: Apprenticeship in writing. *Language Matters, 1-2*, 1–5.

Muter, V., Hulme, C., Snowling, M., & Taylor, S. (1998). Segmentation, not rhyming, predicts early progress in learning to read. *Journal of Experimental Child Psychology, 71*, 3–27.

Nagy, W. E., Kuo-Kealoha, A., Wu, X., Li, W., Anderson, R. C., & Chen, X. (2002). The role of morphological awareness in learning to read Chinese. In W. Li, J. S. Gaffney, & J. L. Packard (Eds.), *Chinese reading acquisition: Theoretical and pedagogical issues* (pp. 59–86). Norwell, MA: Kluwer Academic Publisher.

Nielsen, K. T. (1993). On the spelling of Chinese signs. [Danish] *Psykologisk Paedagogisk Radgivning, 30*, 212–222.

Peterson, B. (1991). Selecting books for beginning readers. In D. E. DeFord, C. A. Lyons, & G. S. Pinnell (Eds.), *Bridges to literacy: Learning from Reading Recovery* (pp. 119–147). Portsmouth, NH: Heinemann.

Pikulski, J. (1994). Preventing reading failure: A review of five effective programs. *The Reading Teacher, 48*(1), 30–39.

Pinnell, G. S., Fried, M. D., & Estice, R. M. (1990). Reading Recovery: Learning how to make a difference. *The Reading Teacher, 43*, 282–295.

Pinnell, G. S., Lyons, C. A., DeFord, D. E., Bryk, A. S., & Seltzer, M. (1994). Comparing instructional models for the literacy education of high-risk first graders. *Reading Research Quarterly, 29*(1), 8–39.

Routman, R. (2000). *Conversations: Strategies for teaching, learning and evaluating*. Portsmouth, NH: Heinemann.

Rozin, P., & Gleitman, L. R. (1977). The structure and acquisition of reading: The reading process and the acquisition of the alphabetic principle. In A. S. Reber, D. L. Scarborough (Eds.), *Toward a psychology of reading* (pp. 55–139). Hillsdale, NJ: Lawrence Erlbaum.

Shu, H., & Anderson, R. C. (1998). Learning to read Chinese: The development of metalinguistic awareness. In J. Wang, A. Inhoff, & H. C. Chen (Eds.), *Reading Chinese script: A cognitive analysis* (pp.1–18). Hillsdale, NJ: Lawrence Erlbaum.

Shu, H., Anderson, R. C., & Wu, N. (2000). Phonetic awareness: Knowledge of orthography-phonology relationships in the character acquisition of Chinese children. *Journal of Educational Psychology, 92*(1), 56–62.

Shu, H., Chen, X., Anderson, R. C., Wu, N., & Xuan, Y. (2003). Properties of school Chinese: Implications for learning to read. *Child Development, 74*(1), 27–47.

Shu, H., McBride-Chang, C.,Wu, S., & Liu, H. (2006). Understanding Chinese developmental dyslexia: Morphological awareness as a core cognitive construct. *Journal of Educational Psychology, 98*(1), 122–133.

Slavin, R. E., Madden, N. A., Karweit, N. L., Livermon, B. J., & Dolan, L. (1990). Success for all: First-year outcomes of a comprehensive plan for reforming urban education. *American Education Research Journal, 27*, 255–278.

Snowling, M. J., Van, B. W., & Stafford, C. (1988). Object-naming deficits in developmental dyslexia. *Journal of Research in Reading, 11*(2), 67–85.

Stanovich, K. E. (1986). Cognitive processes and the reading problems of learning disabled children: Evaluating the assumption of specificity. In J. K. Torgesen & B. Y. Wong (Eds.), *Psychological and educational perspectives on learning disabilities* (pp. 87–131). New York: Academic Press.

Stanovich, K. E. (1993). Dysrationalia: a new specific learning disability. *Journa1 of Learning Disabilities, 26*(8), 501–515.

Stevenson, H. W., Stigler, J. W., Lucker, G. W., Lee, S. Y., Hsu, C. C., & Kitamura, S. (1982). Reading disabilities: The case of Chinese, Japanese and English. *Child Development, 53*(5), 1164–1181.

Tan, L. H., Spinks, J. A., Eden, G. F., Perfetti, C. A., & Siok, W. T. (2005). Reading depends on writing in Chinese. *Proceedings of the National Academy of Sciences of the United States of America, 102*, 8781–8785.

Taylor, B. M., Critchley, C., Paulsen, K., MacDonald, K., & Miron, H. (2002) *Learning to teach an early reading intervention program through Internet-supported professional development.* Edina, MN: Web Education Company.

Treiman, R., & Zukowski, A. (1991). Levels of phonological awareness. In S. A. Brady & D. P. Shankweiler (Eds.), *Phonological processes in literacy: A tribute to Isabelle Y. Liberman* (pp. 67–83). Hillsdale, NJ: Erlbaum.

Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): what have we learned in the past four decades? *Journal of Child Psychology and Psychiatry, 45*(1), 2–40.

Wang, Q. Y. (2005). *Predicting Chinese children's reading development: From kindergarten to second grade*. Unpublished doctoral dissertation. University of Illinois at Urbana-Champaign.

Wasik, B. A., & Slavin, R. E. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly, 28*(2), 179–200.

Wu, X. Y., Anderson, R. C., Li, W., Wu, X., Shu, H., Li, H., et al. (2009). Morphological awareness and Chinese children's literacy development: An intervention study. *Scientific Studies of Reading, 13*(1), 26–52.

Wu, X., Li, W., & Anderson, R. C. (1999). Reading instruction in China. *Journal of Curriculum Studies, 31*, 571–586.

Zhu, J., Wu, X., Zhang, J., & Anderson, R. C. (2010, July). *Accelerating emerging literacy skills of Chinese young children through shared-book reading*. Paper presented at the Research in Reading Chinese and Related Asian Languages Conference, Toronto, Canada.

APPENDIX A
SAMPLE WORD READING TEST

词汇量测试主试用卷（请选用任意一组词）

时间：_____

姓名：_____分数：_____/15

年龄：_____ 出生年月：_____

主试：_____

在空白处记下错误答案

A 组	B 组	C 组
日	克	足
耳	左	鸟
东	米	朝
马	川	矢
她	父	弯
花	春	冠
树	袄	唯
光	鲜	俊
学	句	绳
读	谣	厉
休	壳	潮
盛	蝶	柔
温	涂	冒
粉	吵	愧
冰	鞠	涤

评语：