

# LEARNING STRATEGIES OF CHILDREN WHO KNOW CHINESE

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## **Introduction**

When living within an alphabetic world it is easy to assume that all children learn to read and write by mastering the sound system of their spoken language and associating it in various ways with the symbols of their writing system. Teachers in the West, no matter what their persuasion or teaching methodology, instruct from an underlying assumption that there is a fundamental connection between the sounds of the spoken language and the symbols of their written language. And justifiably so.

The writing system of the Chinese language, however, employs a different foundation of knowledge. Although there is some dispute as to what cognitive mechanisms are triggered while reading Chinese (Cheng, 1992; Perfetti & Tan, 1998), it is clear that Chinese requires some skills that are quite different from English, Spanish and other writing systems that utilize a Latin alphabet. Recognizing and remembering Chinese characters appear to require different strategy configurations.

Studying how Chinese children learn Chinese characters is therefore useful for two reasons. First, by studying what skills are associated with learning to recognize and remember characters, we can learn what skills and strategies children from Chinese speaking backgrounds are likely to bring to English literacy learning. Depending on how teachers treat them, these skills and strategies can become either strengths to build from or barriers that impede English learning.

Secondly, Chinese and U.S. children appear to develop some learning behaviors that are quite distinctive to their literacy communities (Pine, 1992, 1993; Regan, et al., 1995; Stephenson, 1994; Tao & Zuo, 1997). By uncovering the learning strengths of one linguistic community we can learn about untapped areas for potential development

in the other. Since teachers often struggle against multiple odds to do the very best for their students, learning about the literacy foundations of their students as well as their untapped potential can provide innovative ways to enhance English language literacy instruction.

We will first describe beginning Chinese lessons in China and what teachers stress as they teach children to read and write Chinese. We then describe the results of a study that investigated what children say about how they recognize and remember Chinese characters.

### **Description of a First Grade Chinese Lesson<sup>1</sup>**

To the Western observer, used to seeing children sitting at groups of moveable desks and alternating between working independently and collaboratively, the Chinese classroom is markedly different. The 100 plus first grade classes we have observed or have had described to us each contain about 50 six-year-old students who sit in rows of fixed seating. During Chinese lessons, the teachers instruct from the front of the room, aided by a blackboard, colored chalk, small slate-like boards with characters written on them, and poster reproductions of textbook illustrations. The teachers deliver energetic lessons, have very well developed "hand writing" and continuously involve the students through questioning and practicing characters in a variety of ways. From a Western perspective, Chinese lessons in first grade are fast-paced, energetic and noisy.

A few essential differences between Chinese and the Latin alphabetic system are essential to point out before continuing.<sup>2</sup> In order to be literate enough to read a newspaper by the end of sixth grade a child must learn approximately 2500 characters. Although some repetition occurs, especially when simple characters appear as components of more complex characters, the learning task for Chinese is far greater than that required by an alphabetic system. English beginning readers must learn 26 letters; Chinese beginning readers must memorize

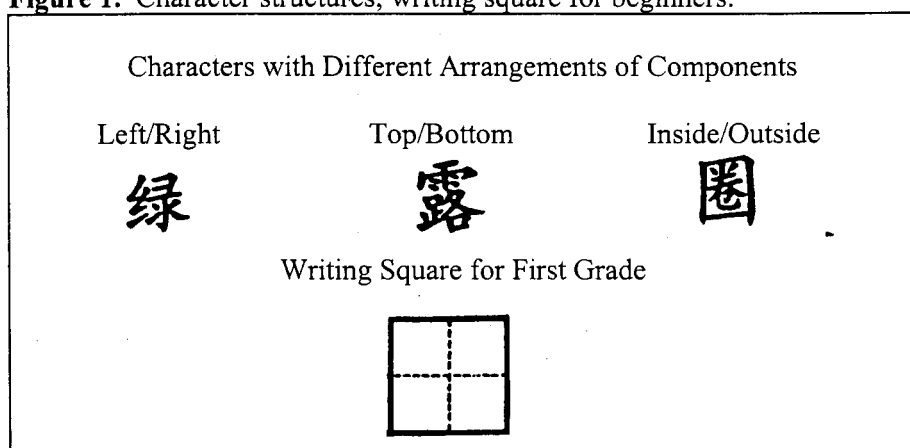
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<sup>1</sup> Chinese instruction is not broken into reading and writing. Rather the two are taught as one process.

<sup>2</sup> This paper discusses characters currently used in the People's Republic of China, excluding Hong Kong. Since the founding of the PRC characters have been simplified to promote general literacy (Yin & Rohsenow, 1994). Hong Kong and Taiwan continue to use the earlier, more complex characters.

hundreds of tightly constructed characters. A character is comprised of multiple strokes—sometimes as many as 30—which have a proper order and method of writing. It has balance and geometrical beauty of itself, and is situated within a visualized square space (Regan, Stephenson, & Pine, in press). In other words, when literate Chinese envision a character, they envision black lines within a white space rather than just black lines, and when they write a character they envision a white square intersected by crossed lines into which the character is placed. Finally, except for the simplest (and first learned), characters are comprised of components. Sometimes they have a component on the left and another on the right (see Figure 1). Sometimes one up, one down. Sometimes a character has three characters embedded within it, and so forth. The skills Chinese children develop in order to become literate are therefore quite different at some points than those required of English or Spanish literacy.

**Figure 1.** Character structures; writing square for beginners.



It should also be pointed out that at the very beginning of first grade (which is the first year of elementary school) children learn Pin Yin, a system of Chinese sounds written in the Latin alphabet, with (for the mainland Chinese language, Putonghua) four tones for each syllable. Children learn this phonetic system quickly—within the beginning four to six weeks of first grade—and it is employed as an early decoding aid. The two systems (Pin Yin and characters) work side by side during the first grade. As children increase their character memory bank, Pin Yin

then drops away, and in upper elementary grades it is only used to introduce new characters.

During lessons that the authors have observed, teachers use a variety of methods while the children have the textbooks in front of them. The teachers follow the textbooks carefully while being innovative in how they involve their students in various ways that are thought to embed characters in children's memories. They ask questions of individuals or the group and have students read aloud, practice characters aloud, state what a given character or passage means, and play verbal games. The children are also asked to finger-write characters in the air while either reciting their names or the stroke names (of which there are 23) aloud.

### **Overview of First Semester, First Grade Chinese Lessons**

The national textbook for the first semester of first grade introduces 160 characters. The text moves quickly into teaching Pin Yin, both the sounds and the related symbols which are Latin letters. The teachers' manual suggests spending six-and-a-half weeks on teaching the children Pin Yin and then another two-and-a-half weeks connecting the Pin Yin to characters and concepts. In other words, a little over half of the semester is used to introduce Pin Yin and to teach how the Pin Yin system works side by side with characters. The rest of the semester focuses on learning characters, with Pin Yin as a tool. Both Pin Yin and character teaching utilize pictures as prompts. In the third month of first grade, the teachers begin teaching characters and sentences with visual aids and paragraph comprehension. The story topics and progression of lessons are listed in Figure 2.

**Figure 2.** Table of contents of first semester, first grade Chinese textbook (People's Education Publishing House, 1993a). Translated by Zhang, W-J.

Orientation	1
Chinese Pin Yin	6
Learning Pin Yin sounds and the Pin Yin of the characters by looking at the pictures	
1--6	35
Basic Drills 1	42
Learning Pin Yin and characters by looking at pictures	
7--12	45
Basic Drills 2	51
Learning characters and sentences by looking at pictures	
1. I am a Chinese	54
2. We love our teachers	57
3. I love my mum and dad	60
Basic Drills 3	62
4. Great changes in the countryside	65
5. A bamboo raft in the picture	66
6. Comparing tails	69
Basic Drills 4	71
Learning paragraphs by looking at pictures	
7. The autumn has come	75
8. A kitten planting fish	77
9. A small goat	80
Basic Drills 5	84
Learning texts	
10. Geese	88
11. A small boat	91
Basic Drills 6	93
12. The seeds of Pu Gong Ying	97
13. A little painter in the snow	101
Basic Drills 7	103
14. Which house is the most beautiful	107
15. Crossing a bridge	110
16. A small rooster and a duckling	112
Basic Drills 8	117
Vocabulary (arranged in categories of radicals)	121

It should be noted also that children at this stage are often learning standard Chinese as many Chinese children speak a different dialect at home. These "dialects" are often less alike than Spanish, Portuguese or Italian, but they share a common writing system. This is a very difficult concept for Westerners to grasp, but an essential one to struggle with.

The textbook also has extra drills and texts to learn, and homework at this age, in our experience, is comprised of writing characters—usually 5 to 10 times each—plus other exercises such as writing a daily journal or reading aloud simple stories.

### What Chinese Teachers Stress<sup>3</sup>

First semester instructions for Chinese teachers stress that children should master Pin Yin, master and understand 160 characters, learn to listen to and speak Standard Chinese, and read a text aloud and understand it. The 23 consonants, 24 vowels (including tones) and 16 syllable combinations are to be learned quickly so that children will “be able to use Pin Yin to learn characters, correct pronunciation, read Pin Yin text and children’s readings, and learn to speak standard Chinese” (People’s Education Publishing House, 1993b, p. 2). Teachers are then to teach children the basic method of recognizing and then learning to write a character, including perfection of strokes and their sequence. They are also to teach the meaning of characters through pictures and phrases, and how to analyze and memorize character shapes.

When the teachers first introduce a character they have the children look at it carefully as a whole and then inspect its details. They next introduce the small units within it. For example, one of the characters introduced in the third month of first grade is ( 妈 , mā ). It includes two components, one on the left, one on the right. The one on the left ( 女 , nǚ ) was introduced as part of another character ( 好 , hǎo ) during the previous drill. The one on the right ( 马 , mǎ ) was introduced three lessons before while teaching children to combine Pin Yin with characters. Therefore, the teacher at this point will have the children notice two separate parts and call their attention to where they have seen them before.

Instruction then proceeds to how to write the character, including focus on various units, but always within the context of the whole, balanced character. The teacher demonstrates on the blackboard with care and emphasizes how each stroke is made, in what order it is written and its proper place within the character. Correct stroke writing and

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<sup>3</sup> Drawn from observations and teacher and parent descriptions and observations of over 100 first grade classrooms in a variety of cities in Eastern and Central China.

stroke sequence are viewed by teachers as essential to learning characters. Children are instructed to write the separate units in the air while saying the stroke names. This is done aloud with great enthusiasm. The children then are asked to write the whole character on worksheets that have gridlines (see Figure 1) so that they can create balanced, well-proportioned characters.

The newly learned characters are then read within the context of a verse or story. The character example above ( 妈 ), for instance, is part of a two-line sentence related to a picture. The teacher often reads the story or verse aloud, has the children carefully discuss it, and then the children practice reading it aloud. Finally, there are follow-up exercises and homework that includes such activities as copying characters and reading stories correctly.

### **What Children Say about How They Remember and Recognize Characters**

Having spent many years probing how Chinese children learn to write characters and how different their processes seem to be from how children decode words in the United States, we designed a research project to probe Chinese children's perceptions of how to learn and remember characters.

We assumed that the children's views would, in part, mirror what and how their teachers taught them, but that it would also mirror the influence of the greater literacy community as well as their individual learning styles (Pine, 1992, 1993; Regan, et al., 1995; also see literacy biographies in Perry & Su, 1998). An initial set of child interviews in a friendly, relaxed environment of one of our apartments in China indicated that this approach could yield rich data.

Several pilot projects taught us how to pique children's willingness to talk about characters. We found that children talked the most when a character they knew had a mistake in it and when they were asked to teach characters to a younger child. Therefore, the final study consisted of two tasks—finding and talking about mistakes in incorrectly written characters that had been taken from their grade level textbooks and

pretending to teach a younger child how to write two characters. We will discuss the first task in this paper.

We presented each child individually with four grade-level characters, one at a time. Each character was one they should already have been taught and each was written with a mistake in it (Figure 3). We introduced children to this activity by using characters from their previous school year. First grade children began with kindergarten characters and so on. Once the children seemed comfortable with this little game of finding and talking about the mistake and how they remembered to write the character correctly, we proceeded to their grade level set, presenting one character card at a time. In a few instances, when the children were unable to identify any of their own grade level characters, we used the characters from an earlier grade in order to encourage them to talk about characters they knew.

The characters were selected by those on our research team knowledgeable about young children's developmental processes in general and about what is taught in the first three years of elementary school—first, second, and third grades. Four characters were selected from the list at the end of the textbook for each grade level.

The Research Setting. The research was conducted in two widely separated cities. The interviewers, native Chinese speakers familiar with the school communities, were selected for their experience with research, their ability to work with children, and their ability to communicate in English. Both were fluent standard Chinese speakers and also understood the primary "dialect" of the children. The English-only researcher was present during all of the pilot and final interviews, which were tape-recorded and translated to English and double-checked by Chinese.

One working-class community school was selected in each city and 15 children randomly selected for interviews in each school—five from each of the first, second, and third grades. The children at each grade level in each school had quite varied knowledge about recognizing characters. Following are small sections of two typical interviews. Each one is from a first grade child. The character cards referred to in the interviews are shown in Figure 3.



**Figure 3.** Samples of card pairs used for children's interviews, incorrect and correct characters, by grade level.

Set #	Incorrect Character	Correct Character	Pin Yin & English
K.1	电	电	<u>diàn</u> [electricity]
K.2	球	球	<u>qiú</u> [ball]
1.2	燕	燕	<u>yàn</u> [swallow]
1.3	出	出	<u>chū</u> [exit]
2.2	闷	闷	<u>mēn</u> [stuffy]
2.4	裤	裤	<u>kù</u> [trousers]
3.2	鞠	鞠	<u>jū</u> [bow]
3.4	躺	躺	<u>tǎng</u> [lie down]
All grades	唱	唱	<u>chàng</u> [sing]

Child 2x; yàn, swallow [a type of bird]

Interviewer: [showing child a character with a mistake] Do you know this one?

2x: This is.....

I: What?

2x: (It's) yàn [swallow].

I: Yes, the character for swallow. Is it right or wrong?

2x: It's wrong.

I: Why is it wrong?

2x: The part below should be four dots, but not a horizontal bar?

I: Can you write it down?

2x: [writes character correctly]

I: Then how do you know that it should be four dots instead of a bar?

2x: Because we have learned this character.

I: You have learned it before. Then how do you remember that it should be four dots but not a bar?

2x: I remember all that I have learned.

Child 2z; chàng, to sing:

Interviewer: [showing child the incorrect chàng card]

What's this character?

2s: It isn't a character.

I: It is wrong, isn't it? You write down a correct one.

2s: [Writing it correctly]

I: Hmm. What is it?

2s: It's chàng [sing].

I: Chàng. Hmmm. How do you remember it?

2s: It's a character of shape and sound. The left part is kǒu [a component which means "mouth"]. It shows the meaning. We use our mouth to sing, so it's kǒu [mouth].

The right part is chàng<sup>4</sup> [another character] and it gives the sound. So it's chàng (sing).

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Chang is a different character from chàng, but with a somewhat similar sound, though a different one. The shapes and meanings of chang and chàng are different.

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### The Children's Responses

Ten categories of talking about and remembering characters have emerged from the children's responses. They are listed in Figure 4. The categories appear to reflect the nature of Chinese character structure and shape and are, one could conjecture, quite different from how Western children talk about reading and remembering words.

Structural analysis. By far the most widely used categories by the 30 children (*a*, *c* and *g* in Figure 4) are related to structural analysis of whole characters and their smaller units. Interviews with the children encouraged open-ended responses at each grade level, and the children chose to use a variety of structural terms to talk about most characters. For example, referring to the character yàn [swallow], the following interchange took place between the interviewer and a first grader:

I: Is it right or not?

5x: No.

I: How do you know that?

5x: Because the end part of it shouldn't be this horizontal bar but four dots.

In another example, talking about diàn [electricity] a first grade student said,

1x: This stroke should be pointed out [of the character]...The stroke should go beyond this horizontal line.

Students frequently divided characters into their constituent parts and then described them in relation to other characters or character parts. The following response by a second grader describing yàn [swallow] is typical.

I: ...Then how do you remember it?

6z: I divide it into several parts. The bottom part is four points; the middle part is a kǒu [mouth, 口] and a separated běi [north, 北]; the upper part is a cǎo [a component meaning "grass" 艹] and a dash. [*Hand motions accompany all 3 parts-- upper, middle, lower.*]

The child first identified the whole character and then explicitly separated it into parts that she related to other characters. Notice the specificity that is used and the ability to analyze the character structure.

**Figure 4.** Coding categories derived from children's interviews. (Categories of ways children say they recognize and remember characters.)

- a. Child associates the character with another character or a part of another character. For example, the child associates the various small units of the character with other characters or small units.
- b. Child uses stroke order and/or stroke names.
- c. Child uses structural analysis of characters or parts of characters. For example, the child describes what is wrong with the incorrect character by referring to specific strokes or to the function of different parts of the shapes.
- d. Child uses the relationship of shape to meaning. For example, the child describes the character kou [mouth] as having the shape of a mouth.
- e. Child uses kinesthetic means to remember or talk about character; writing appears to activate knowledge. For example, the child finger writes in the air while talking about the character.
- f. Child uses a brief story or narrative to explain or remember a character or part of a character.
- g. Child separates character into explicit parts.
- h. Child states that without a given stroke or element "it isn't a character any longer."
- i. Child "knows it," but reasons given are very general, saying, for example, "I know it because we have learned this character."
- i. Child "hasn't learned it" because, for example, "The teacher hasn't taught us."
- j. Child refers to the appearance of the character, in general, by saying something like, "It's a character because it's nice looking."

Other categories used by the children, though less frequently, included reference to and naming of specific strokes within a given character. This was used by first graders, but was almost never used by second and third graders. Also younger children who were not able to talk about a character as specifically as the above second grader, often stated that it was not a character. Although they could not give details, they already had embedded in their memory an image of "what is a character."

Children habitually used their fingers to write characters on their laps or moved their pencils above the paper to work out what a character should look like. This is a strategy that appears to be used by adults as well (Regan & Zhang, 1997).

Linking Shape and Semantics. The strategy of linking character shape directly to meaning was almost never used by the children. This is an interesting development since in our experience most Westerners assume that characters pictorially represent an object or idea. Almost no children talked about character/object shape similarities as a means for remembering or recognizing a character.

Stories, however, were used by a number of children to describe how they remembered a few particular characters. As one interviewer put it, "Connections made between a character and the thing it represents, though not logical or reasonable, may serve as a prompt to learn that character when one is young." These stories tended to be associated with a few specific characters and were used by many of the children. Possibly they were taught by the teachers or passed along from one child to the next, a bit like the English saying, "When two vowels go walking, the first one does the talking." An example of one of these is associated with the character men [stuffy]. A child from one city responded:

- I: How do you know this is an extra piě [diagonal stroke]?  
 8x: Because inside a ... door... In one's heart, he feels depressed.  
 That... that's why we can't put a piě here.  
 I: { It should be a ...  
 8x: { It should be a xīn [heart] inside the door.  
 I: Should be a xīn?  
 8x: Yes.

A child from the second city responded similarly:

- I:...How do you remember it then?  
 14z: Mēn [stuffy] is a character of shape and sound. Mén [door] has the similar sound as the character "stuffy" and the heart means that you feel bored in your heart.

This story, it is important to note, relates to the two characters embedded within the character for mēn [stuffy]. It does not directly relate to a picture of the idea.

### Implications for Western Teachers

To Westerners some very specific characteristics jump out of the Chinese children's strategies. First is the very clear distinction children made between recognizing characters and learning to write them. In relation to the character qiú [ball], one first grader said:

3x: We haven't learned this character.

I: You haven't?

3x: I only can recognize this character.

They seemed to have an imprint of the correct character in their memories. They seemed to have no idea of how to describe its complex structure; they could, however, write it correctly.

Another characteristic is the strong focus on structural components and structural analysis. Almost all of the children chose to talk about several different characters by referring to structural components and how they were linked to the whole character as well as to other characters. They visually segmented the characters.

Linked to this is the "unusual" (from a Western perspective) detailed noticing employed by young Chinese children. In the following typical example, this first grader already demonstrates having a detailed, internalized reference for what is and is not a character.

I: How do you know that it should be four dots but not this bar?

5x: Er...If it is this bar, it isn't a character any longer.

The young children talked about the mistakes with considerable specificity. This specific noticing may not all be taught in school, but in part may be embedded in cultural behaviors and nuances picked up long before school (see, for example, Perry & Su, 1998 and Pine 1992, 1997). The fact remains, however, that by mid-first grade, children have acquired a very specific type of knowledge and way of learning that

tends to include the ability to notice highly detailed, small nuances of character structure. This appears to be a very different learning strategy from those used by Western beginning readers.

Also quite foreign to Westerners are the use of stroke order and stroke name which take on great significance to first graders as they begin learning Chinese and appear to become embedded in their memory bank and fingers by the end of first grade. These kinesthetic patterns are strong enough so that when several children were stumped by the incorrect characters, they were still able to write them correctly. Although this latter behavior may be similar to an English writer who is trying to remember how to spell a word, the finger writing or pencil-above-paper writing are not usually seen in the West, but were commonplace among these 30 children.

### **Conclusion**

What are the implications for Western teachers of the learning exhibited by these Chinese children? What strategies would they bring to English literacy if they were suddenly transported to the United States? They appear to have learned to envision and reproduce highly complex characters that have quite different characteristics from the English alphabet. Although children who know Chinese may not understand how to approach English words phonetically, they carry with them into U.S. classrooms a highly developed knowledge base which can be used as a foundation for learning. They appear to have well-developed analytical skills to segment and interpret detailed, complex shapes that carry visual information and semantic value. These skills might provide an entree into visually decoding or constructing words and quickly perceiving the visual similarities among root words. The children might need considerable help to decode English phonetically, however, and to have this skill introduced explicitly, with the understanding that it might be a completely foreign concept to them. The challenge for the teacher is to notice what strategies the children employ and build from them, using them as a strength.

The children's abilities to notice detail and to hold complex shapes in memory and analyze them suggest potential areas for learning that we may not have tapped in the West. Although we are in no way suggesting

that Western schools should imitate Chinese schooling, it is helpful to know what children in other cultures have learned to do in the normal course of literacy development. The children discussed in this paper provide a glimmer of the potential that lies within all children.

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