




# Reading Literacy in Chinese: Breaking the code

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Learning to speak is a natural process.  
Learning to read is not.

- Young children exposed to spoken (or signed) language will naturally learn that language.
  - Children's brains are 'wired' to learn language.
  - Young children, or adults, exposed to reading may never learn to read.
  - According to the National Assessment of Educational Progress, more than 60 percent of American fourth-graders are not proficient readers.
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# “Hard Words: Why aren’t our kids being taught to read”

- American Public Media Reports ([APMreports.org](http://APMreports.org)) on the failure of American Schools to teach reading, September 2018
- “Decades of scientific research has revealed that reading doesn't come naturally. The human brain isn't wired to read. Kids must be explicitly taught how to connect sounds with letters.”
- “The basic assumption that underlies typical reading instruction in many schools is that learning to read is a natural process, much like learning to talk.” The assumption is that exposure to reading is all that it takes for children to learn how to read.
- “The prevailing approaches to reading instruction in American schools are inconsistent with basic things scientists have discovered about how children learn to read. Many educators don't know the science, and in some cases actively resist it. ”




# The situation in Chinese is comparable

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- Research on Chinese native speakers (L1 learners) and learners of Chinese as a second language (CFL learners) show that successful readers know certain things about the written language that unsuccessful readers do not know.
  - The findings clearly point to the need for explicit instruction in learning these aspects of the written language.
  - This information is rarely if ever incorporated in the reading instruction of CFL learners.



Writing is a code that readers need to learn how to decipher

- Writing is a code humans invented to represent speech sounds. Kids have to crack that code to become readers.
  - Children don't crack the code naturally. They need to be taught
  - In English, the most important skill that readers need is the ability to map Alphabetic letters to speech sounds.
- 



# Chinese is more complicated

- The Chinese writing system does not “spell” words with a small number of letters.
- Instead, Chinese is written with characters.
- There are thousands of characters. You need to know 2000-3000 or more just to read a newspaper.
- Characters don't provide a direct connection to sound. You cannot reliably ‘sound them out.’
- Characters are not necessarily words. Characters most often are pieces of multi-character words.
- Chinese does not provide word boundaries for words. Instead, characters are equally spaced on a page.






# What this talk is about

- The skills required to become literate in Chinese, from lower level to upper level.
- Research findings that identify best practices in Chinese literacy instruction, especially for lower-level skills.
- Resistance in the field of CFL to the application of research to instructional practices.
- Illustration of best practices in literacy instruction incorporated in CFL curriculum.



# How do we know reading is a skill that has to be learned?

- Studies in English and Chinese among L1 readers show that better readers know certain things about the written language that weaker readers do not.
  - Studies among L1 readers in English show that reading proficiency improves dramatically when the weaker readers are taught the skills that the strongest readers have.
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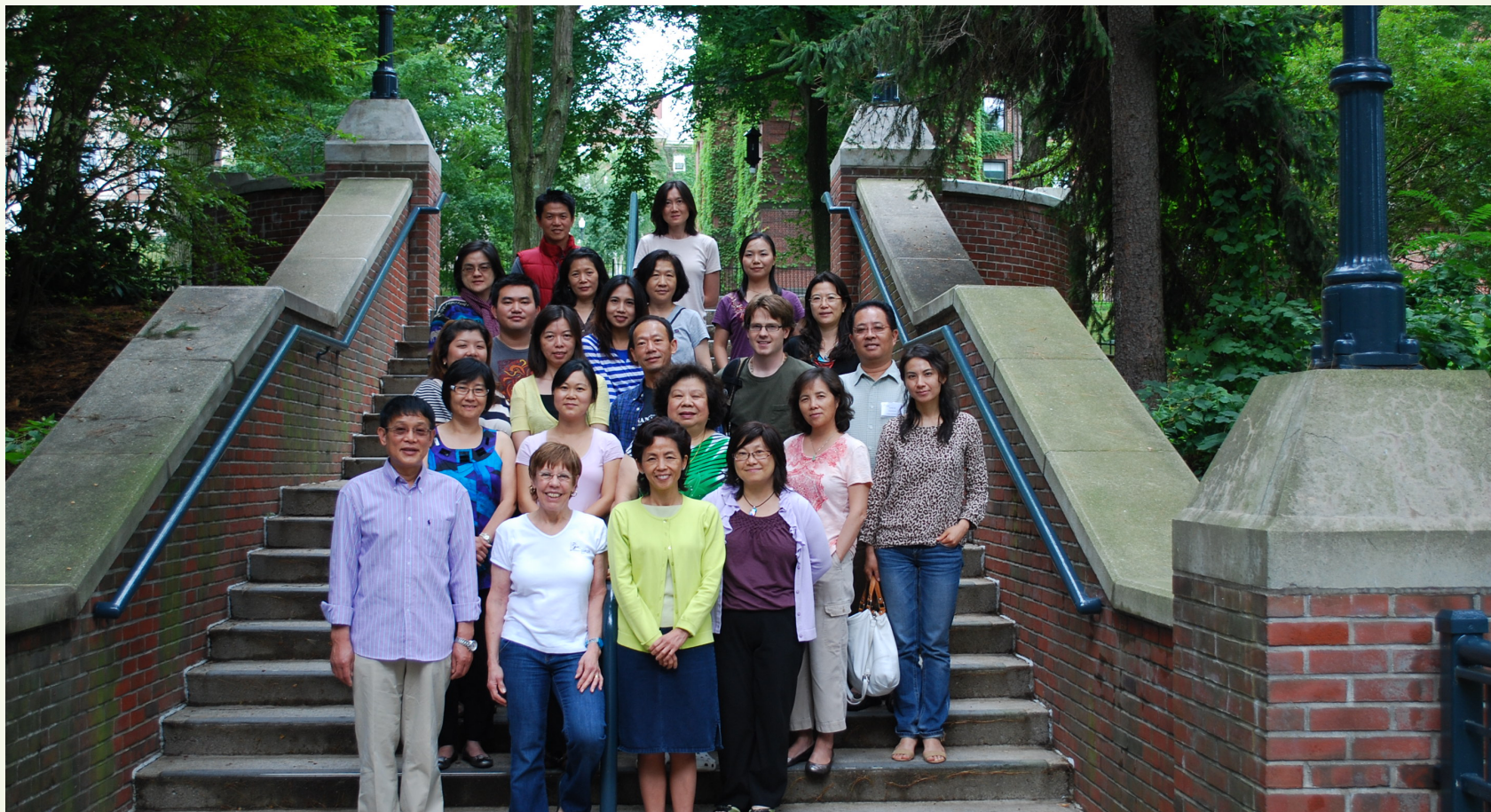




# Who I am, and my role in this process

- Professor of Chinese, PhD in theoretical linguistics, teaching for the past 31 years at the College of the Holy Cross, a small liberal arts college in New England. My primary responsibility is to grow and maintain a Chinese language program geared predominately towards non-heritage learners of Chinese.
- Lead author of several reference grammars on Mandarin Chinese, and a two-level Mandarin Chinese textbook.
- Director (2012-2018) of the “Read-On” Startalk Program, where we have been focusing on **connecting research to instructional practice.**

# Read-On Startalk Program Participants, 2012





# Read-On Startalk Program Participants, 2018



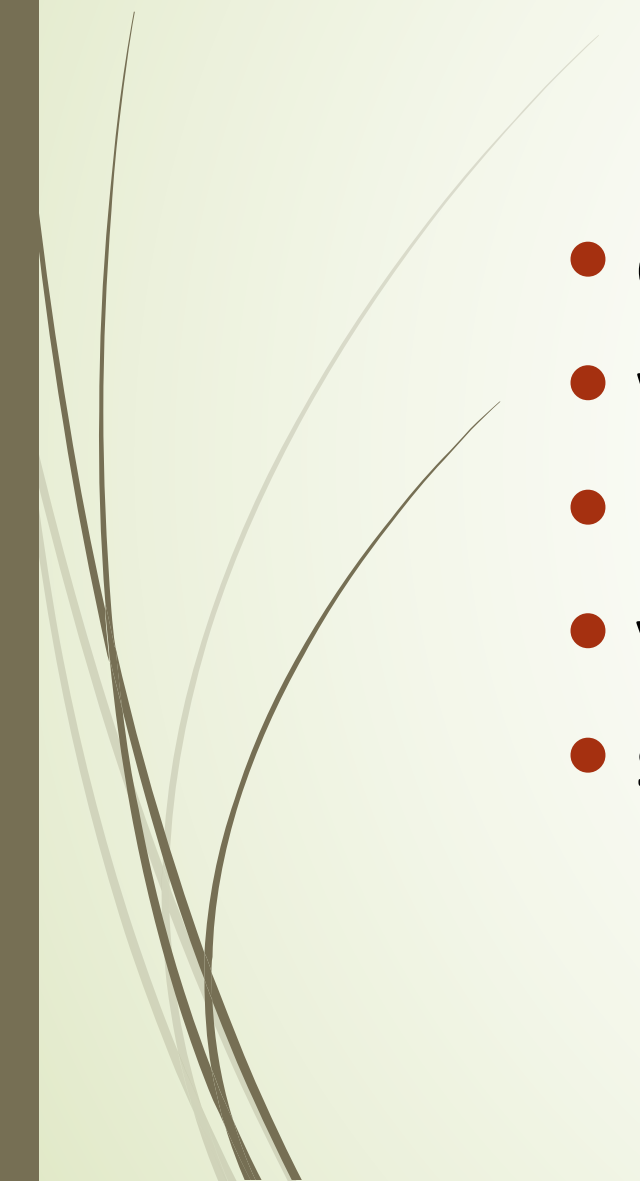


# “Read-On” Startalk Participants from CAIS

- Kevin Chang
  - Michael Hsu
  - Yaching Hsu Kelkis
  - Ena Chen
  - Xiaoqing Chen
  - Xiaohong Sui
- 

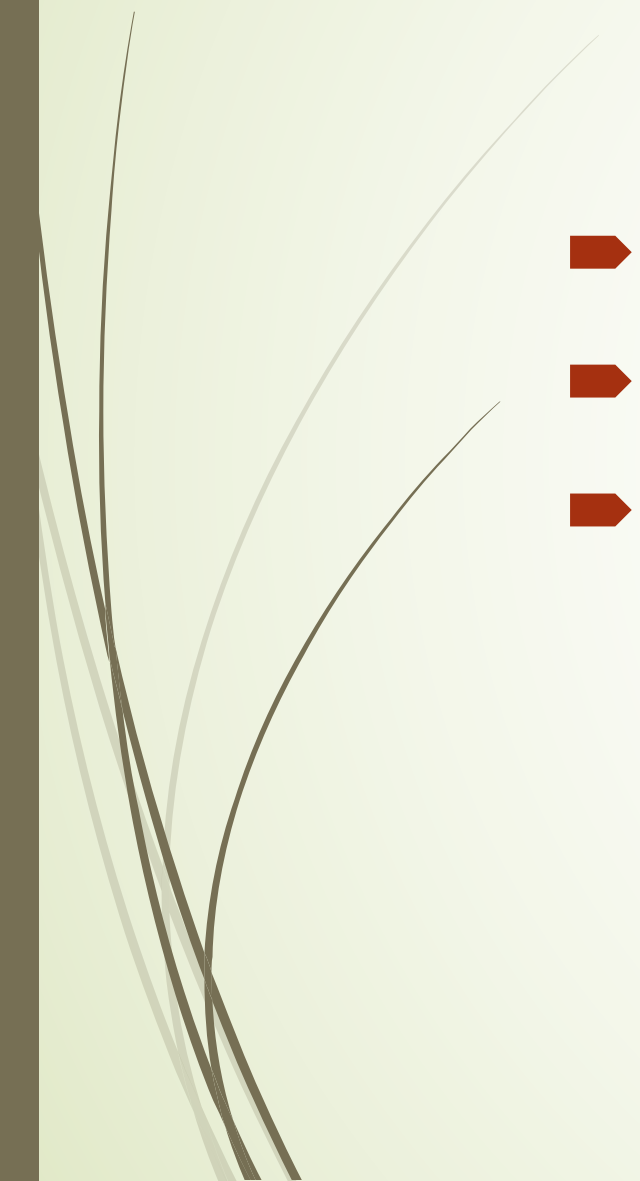


## Lower level reading skills

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- character identification (accuracy and speed)
  - word boundary identification
  - phrase structure identification
  - vocabulary recognition and lexical access
  - sentence comprehension



# Higher level reading skills

- Reading for literal comprehension
  - Reading for inferences
  - Evaluative reading: the ability to use one's knowledge of the real world to understand the passage.
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# Breaking the character code

1. Characters have an internal configuration



Breaking the code: Notice the internal configuration of characters

➡ Match the characters with their shape



草 做 这 左 边 上 门 国 早 他

草 做 這 左 邊 上 門 國 早 他

Breaking the code: Notice the internal configuration of characters (pre-reading)

➡ Sort the characters by shape




妈 家 不 星 期 昨 天 这 右 边 先 生 湖

Breaking the code: Notice the internal configuration of characters (pre-reading)

➡ Sort the characters by shape



不	家		妈	湖	这	右		
天	星		期		边			
生	先		昨					

## 2. Characters consist of a relatively small number of components (部件) (pre-reading)

Circle the components parts of each character

a. 没: 示 几 才 女 门 口 马 日 彳 十 彳 石 也 丁 人 刀 灬 又 西  
生 讠

b. 打: 示 几 才 女 门 口 马 日 彳 十 彳 石 也 丁 人 刀 灬 又 西  
生 讠

c. 姓: 示 几 才 女 门 口 马 日 彳 十 彳 石 也 丁 人 刀 灬 又 西  
生

d. 问: 示 几 才 女 门 口 马 日 彳 十 彳 石 也 丁 人 刀 灬 又  
西 生

### 3. 部件 occur in fixed locations within a character

Add these into the following shapes to make a well-formed character:

心	十	相	
寸	十	又	
斗	十	每	
灬	十	木	
丩	十	青	
扌	十	丁	



#### 4. The meaning code: Some character components provide meaning clues (部首)

口	kǒu	mouth
人 (亻)	rén	person
水 (氵)	shuǐ	water
日	rì	sun
女	nǚ	female
言 (讠)	yán	language
手 (扌)	shǒu	hand
木	mù	wood/tree
子	zǐ	child

# Radicals and meaning cues

Circle the character that corresponds to the meaning on the left. Explain your choice.

**Yesterday:** 作, 昨, 柞

**Speak:** 说, 浼, 挽

**Forest:** 淋, 淋, 林

**Mom:** 码, 吗, 妈

**Ask:** 们, 问, 扪

(which one is plural for people? Which one means to touch? Give evidence: How do you know?)

## 5. Some character components provide pronunciation clues (聲旁)

女	如	現	玩	把	門	放	紅
房	先	工	式	選	完	讓	爸
見	試	跟	院	上	方	問	很

1. 方 : 方、房

2. 元 : 玩、完






3. 門 : 門、問

4. 艮 : 很、跟

5. 見 : 見、現

6. 式 : 試、式

Guide learners to notice the phonetic components of characters that they are learning

phonetic	Characters that rhyme or almost rhyme and share this phonetic component
方	
门	
上	
见	
元	

园 问 门 现 间 远 房 玩 放 让 们



# Breaking the word code

How do you identify word boundaries?

This is a lower-level and higher-level literacy skill.

Lower-Level

1. Automaticity in word identification

Higher-Level

2. Predicting possible vocabulary based on the topic of the text

## 过年买新衣

寒假的前一天，妈妈和我去买过年要穿的新衣服。

大街上人来人往、车来车往，很热闹。我和妈妈走进了一家服装店。哇！里面好多人啊！有的在试穿衣服、有的在付钱……里面的衣服好多，有男装、有女装、五颜六色，好漂亮！我左看右看，东看西看，不知道哪一件好。最后，买了一条粉色的裙子和一件天蓝色的毛衣，一共是四百七十五元。但是太贵了，所以妈妈讨价还价，最后只花了两百元，真便宜！我很开心，妈妈也很高兴。我真希望明天就是春节，可以穿上我的新衣服！




# Building word boundary identification

Identify-Circle all words that refer to **clothing**. (Key vocabulary in lesson)

- ➡ 寒假的前一天，妈妈和我去买过年要穿的新衣服。
- ➡ 大街上人来人往、车来车往，很热闹。我和妈妈走进了一家服装店。哇！里面好多人啊！有的在试穿衣服、有的在付钱……里面的衣服好多，有男装、有女装、五颜六色，好漂亮！我左看右看，东看西看，不知道哪一件好。最后，买了一条粉色的裙子和一件天蓝色的毛衣，一共是四百七十五元。但是太贵了，所以妈妈讨价还价，最后只花了两百元，真便宜！我很开心，妈妈也很高兴。我真希望明天就是春节，可以穿上我的新衣服！



## Notice lexical structure

- 服装\_男装\_女装
  - 服装\_衣服
  - 衣服\_毛衣 (大衣)
- 

# Breaking the phrase structure code

## Noticing and rapidly identifying phrase structure markers

我买了<sup>1</sup>一条粉色<sup>2</sup>的<sup>3</sup>裙子<sup>4</sup>和一件天蓝色<sup>5</sup>的<sup>6</sup>毛衣<sup>7</sup>,  
一共是四百七十五元。但是太贵了,所以妈妈讨价还价,最后只花了两百元,真便宜!  
我很开心,妈妈也很高兴。我真希望明天就是春节,可以穿上我的<sup>8</sup>新衣服!


## Phrase Structure – identify all SUBJECTS

寒假的前一天，妈妈和我去买过年要穿的新衣服。

大街上人来人往、车来车往，很热闹。我和妈妈走进了一家服装店。哇！里面好多人啊！有的在试穿衣服、有的在付钱……里面的衣服好多，有男装、有女装、五颜六色，好漂亮！我左看右看，东看西看，不知道哪一件好。最后，买了一条粉色的裙子和一件天蓝色的毛衣，一共是四百七十五元。但是太贵了，所以妈妈讨价还价，最后只花了两百元，真便宜！我很开心，妈妈也很高兴。我真希望明天就是春节，可以穿上我的新衣服！



# Vocabulary recognition

- Optimal % for text comprehension
  - Can you guess around unfamiliar words?
  - How many characters can CFL learners learn and retain in long-term memory?
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# A Sufficient Inventory of Characters and Words

Shen 2005 (based on CFL learners who had completed 1 year of College-level Chinese study):

- Unfamiliarity with **5%** of the characters in the text decreases comprehension to **70%**.
- Unfamiliarity with **7%** of the characters in the text decreases comprehension to **64%**.
- Unfamiliarity with **10%** of the characters in a text decreases comprehension to **58%**.
- Every increase by **1%** of unfamiliar characters decreases reading comprehension by **2-4%**.



# Comprehension and character familiarity

## A look at character recognition and comprehension

四年級的例子：約120 不同的漢字。

若不認識5% ( 6 字 )

美國聯邦準備理事會 (Fed) 日昨宣布縮減QE (量化寬鬆) 政策的規模，從明年一月開始，購債金額從每月850億美元縮減100億美元到750億美元。Fed並且強調，在失業率達到6.5%目標後，仍將維持當前0%至0.25%的超低利率目標。消息傳出後，歐美股市紛紛上漲，而各國貨幣相對美元則多半重挫。前者是因為QE減碼幅度溫和，利空出盡；後者則因美國印鈔票救經濟的速度減緩，表示美國基本面回穩，美元將不再持續疲弱，因而紛紛對美元貶值，新台幣兌美元更創下三個月來之最大貶幅。

四年級的例子：約120 不同的漢字。

若不認識10%（12字）

美國聯邦準備理事會（Fed）日昨宣布縮減QE（量化寬鬆）政策的規模，從明年一月開始，購債金額從每月850億美元縮減100億美元到750億美元。Fed並且強調，在失業率達到6.5%目標後，仍將維持當前0%至0.25%的超低利率目標。消息傳出後，歐美股市紛紛上漲，而各國貨幣相對美元則多半重挫。前者是因為QE減碼幅度溫和，利空出盡；後者則因美國印鈔票救經濟的速度減緩，表示美國基本面回穩，美元將不再持續疲弱，因而紛紛對美元貶值，新台幣兌美元更創下三個月來之最大貶幅。

四年級的例子：約120 不同的漢字。

若不認識**20%**（**24 字**）（等於“全認班”學生認字能力）

美國聯邦**準**備理事會（Fed）日昨宣布**縮減**QE（量化**寬鬆**）政策的規模，從明年一月開始，**購債金額**從每月850**億**美元**縮減**100億美元到750億美元。Fed並且**強調**，在失業**率**達到6.5%目標後，仍將**維持**當前0%至0.25%的**超**低利率目標。消息傳出後，歐美股市紛紛上**漲**，而各國貨**幣**相對美元則多半重**挫**。前者是因為QE減碼幅度溫和，利空出**盡**；後者則因美國印鈔票救經濟的速度**減緩**，表示美國基本面回**穩**，美元將不再持續疲**弱**，因而紛紛對美元**貶**值，新台**幣**兌美元更**創**下三個月來之最大**貶**幅。



# Handwriting of characters

- The issue:
- Learning to write characters by hand is time consuming
- In the real world, for most purposes, native speakers type (or digitally input) characters rather than writing them by hand.
- In the workplace, digital input is the rule
- Is there any benefit to learning to write characters by hand?

## Two relevant studies

### ➤ *Among elementary school aged-learners*

Ellen Knell & Haii West 2015, "Writing Practice and Chinese Character Recognition in Early Chinese Immersion Students, *Journal of the Chinese Language Teachers Association* (now CSL), 50.3.45-61.

### ➤ *Among College-age learners:*

Guan C. Q., Liu Y., Chan D. H. L, Ye F., and Perfetti C. A., 2011, "Writing strengthens orthography and alphabetic-coding strengthens phonology in learning to read Chinese," *Journal of Educational Psychology*, 103, 509-522.





## Knell and West

**The subjects:** 46 first grade students in 50/50 Mandarin-English immersion program, divided into two groups.

**The content:** 50 characters (plus numbers 1-10)

**The constants:**

- Both groups used the same textbook, learned the same characters, were taught by the same Chinese teacher, followed the same curriculum at the same pace.
- At start of semester, both groups learned the names of the strokes and practiced writing some basic characters.

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- ➡ Both groups engaged in 'recognition activities' for the target characters including:
    - concentration,
    - matching,
    - bingo,
    - vocabulary games.



# Activity format (NOT the actual tasks)

Match the character

狗                      a. 夠    b. 狗    c. 句    d. 獅

←

句


獅

夠



Bingo

我	四	六	八	姐
七	二	哥	爸	你
車	第	X	口	學
狗	他	三	十	手
九	五	妹	一	媽



## Concentration

他		

1	2	他
4	5	6
7	8	9
10	11	12

## The experiment:

24 students (morning Chinese): Control Group (the 'no writing' group)

22 students (afternoon Chinese):  
Experimental Group (the 'writing' group)


Experimental group – 20 minutes of  
guided character writing practice/day.

Control group – no additional character  
activities

## The tests:

1. Recognition (total 20 characters tested). Teacher displayed a character and students pronounced it. (Tone not scored.)
2. Selection (total 16 characters tested). Students saw 4 characters in a row. Teacher read a character and students circled the one they believe matched the reading.
3. Writing (6 characters) . Teacher said a character and students wrote it.

## Results:



Experimental group (the 'writing group') scored **significantly higher** on **recognition** tasks than control group.


Experimental group scored **significantly higher** on **production** tasks than control group.

Both groups performed equally well on the selection task.


*Note: Recognition is a real-world task.  
Production is a real-world task. Selection is not a real-world task.*



## Guan, et al. Study of handwriting effects on college students learning CFL

- The study: Some students were instructed to write characters as they learned them in a controlled environment designed for the experiment. Some students were not instructed to write characters as they learned them.
  - Results: Students who hand-wrote characters had significantly higher recognition scores.
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## Guan et al, Study 2 –the role of pinyin

Experiment 2: To determine whether and to what extent integrating writing with Pinyin-input typing could strengthen the connection between form, meaning, and pronunciation.

Results: Typing the pinyin pronunciation of characters as part of character study improved pronunciation. It was much less effective than handwriting in leading to character recognition



## Some conclusions

- Chinese-educated native speakers learn to write characters quickly and accurately (they reach 'automatization' in the hand writing of characters in their early years of literacy acquisition.
- In the process, successful readers learn the codes involving character structure, and have reached automaticity in the production of character components.
- Successful L1 readers have reached automaticity in the identification of phrase structure, and have acquire a large reading vocabulary
- I suspect that once readers have reached automaticity in the production of components, character learning can proceed effectively without the intensive hand-writing of characters.



# More conclusions

- Reading, whether in Chinese or in English, involves learnable, teachable skills.
  - Some learners figure out these reading skills without instruction.
  - Some students need to be taught these skills.
  - All students benefit from ongoing instruction in reading skills.
  - For CFL learners, Pinyin plays an important role in linking the form of characters with their pronunciation.
  - Character, word, and phrase literacy are the foundation of reading, but they are just the beginning. Learners also need to learn how to read for information, both literal and inferred, and must accumulate sufficient cultural knowledge to read and understand authentic texts.
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