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derstanding Chinese Developmental Dyslexia: Meta-linguistic Awareness in both Chinese Reading and Writing

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Abstract

- 1. Learning to read Chinese requires rather different insights from young readers than does an alphabetic system.
- 2. Chinese readers with dyslexia were best distinguished from age-matched controls with tasks of morphological awareness, speeded number naming, and vocabulary skill;
- 3. Performance on tasks of visual skills or phonological awareness failed to distinguish the group.
- 4. Findings suggest that morphological awareness may be a core theoretical construct necessary for explaining variability in reading Chinese.
- 5. Morphological instruction helped Chinese Developmental Dyslexia to master the structural rules of different types of characters and to apply the rules analytically when learning to read and write Chinese characters.

Behavioral Evidence of Chinese Developmental Dyslexia

- Logistic regression analyses revealed that Chinese readers with dyslexia were best distinguished from agematched controls with tasks of morphological awareness, speeded number naming, and vocabulary skill (Shu, McBride-Chang, Wu & Liu, 2006)
- Path analyses further revealed that a construct of morphological awareness was the strongest consistent predictor of a variety of literacy-related skills across both groups.
- The nature of the meta-linguistic insights that are important for Chinese reading depends upon the writing system.

Phonological Awareness in Chinese

- Children in Mainland China have Pin-Yin (spellsound) training (which is, the teaching of phonetics) before they start learning to read Chinese, and it has been suggested to be effective in Chinese reading acquisition and development
- Zhu-Yin-Fu-Hao (sound annotating graphs) in Taiwan has led to increased phonological awareness which is important in Chinese reading acquisition and development

Differences between Mandarin & Cantonese

No. of	Mandarin	Cantonese
Tones	4	6 to 9
Distinct "tone syllables"	1300	2000
Syllables before differentiation	403	627
Rimes	36	53

* Cantonese has a more complicated phonetic system than Mandarin *

Phonetic Systems

In Mainland China:

Spoken dialect: Putonghua

Phonetic system taught: Pin-Yin

In Taiwan:

Spoken dialect: Mandarin

Phonetic system taught: Zhu-Yin-Fu-Hao

In Hong Kong:

Spoken dialect: Cantonese Phonetic system taught: None

Morphological Awareness Is Important to Chinese Reading

- Morpheme awareness is the understanding that words with the same pronunciation and may have different meanings.
- Homograph awareness is the understanding that the same character may have different meaning.
- Radical awareness concerns understanding the role of radicals in the Chinese writing systems

Chinese Characters





Morpheme awareness -Homophones (Initial)



Morpheme awareness - Homophones (final)



Homographic awareness (Initial)



Homographic awareness (final)



Radical awareness



The role of phonological and morphological awareness in learning to read Chinese (Shu, Anderson & Li, 2006)



Caes QZY: Phonological awareness QZY Control (n=5)

Auditory memory Identification (single syllable) Identification (word) Syllable identification (real word)	0.60 0.50 0.50 0.94	0.96 0.88 0.92 0.98
(pseudo word)	0.92	1.00
Rime judgment	0.81	0.98
Concernment identification	0.42	0.90
Rime identification	0.42	0.92
Tone identification	0.50	0.90
Phoneme deletion	0.56	0.80

QZY 's phonological awareness was week.

Case L: Morphological awareness

	L	Control(n=5)
Morpheme judgment	0.64	0.70
Meaning selection	0.25	0.58
Homophone selection Radical	0.62	0.91
Morpheme	0.68	0.98

L performed poorly in morphological awareness tasks. The unit of Chinese writing system map not onto phonemes or syllables, but onto morphemes, units defined in term of both sound and meaning

Morphological Awareness is a Core Cognitive Construct in Chinese Reading

Significant Variables in First Step Logistic Regression

Variable	x ² (1,N = 152)
Morpheme production	49.95
Phoneme deletion	23.53
No. naming	23.97
Vocabulary	27.99
No. repetition	18.04

Note: Chi-square is the change in -2log-likelihood if the predictor is removed from the model. All ps<.001.

(Shu et al., 2006)

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Prediction of Dyslexia

	Predicted		
Observed	Dyslexia	Control	Prediction Rate
Dyslexic	59	16	78.7%
Control	18	59	76.7%
Production Rate	76.7%	78.7%	

Note: Cutoff value p<.5. (Shu et al., 2006)

Model of Chinese character recognition



Model of Chinese character dictation



Model of Chinese reading comprehension



Chinese Morphological Awareness Instruction



Chinese Morphological Awareness Instruction (HK PolyU, 2007)

- Pictographic characters
- Simple ideographic characters
- Compound ideographic characters
- Semantic phonetic compound characters
- Orthographical awareness
- Selection of radical elements
- Homophones differentiation
- Homograph awareness
- Reading and writing activities





Chinese Morphological Awareness Training Results (HK PolyU, 2008)

Morphological Awareness Measures

Morpheme production

The experimenter gave the word 'cao3di4' (meaning lawn), the child was asked to produce a new word with the morpheme [cao3] had the same meaning as it did in 'cao3di4'.. One acceptable answer would be xiao3cao3 (meaning grass). The child was also asked to say a word that included the morpheme [cao3] in which its meaning was different from that in 'cao3di'

		Pre-	Post-		
		test	test	%	p
Exp.	Mean	10.71	13.55	26.52%	*** <.0001
	SD	2.94	2.99		
Con.	Mean	11.4	12.82	12.46%	*** <.0001
	SD	3.52	3.17		

Pseudo Word

Please put a 'tick' next to the real characters, and a 'cross' next to the pseudo characters with illegal structures

請判斷以下哪些是真字,哪些是假字。並在真字旁的()內劃 √;在假字旁的()內劃 X。

例子:

1. 拍	(√)	2. 力1	(X)
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		Pre-	Post-		
		test	test	%	p
Exp.	Mean	24.55	26.93	9.69%	*** <.0001
	SD	3.08	2.78		
Con.	Mean	24.76	26.08	5.33%	*** <.0001
	SD	3.12	3.62		

Morphological Radical

Instructions:

In every trial you will hear a complete sentence, but the same sentence in written form that you can see below misses a character. Circle the missed character from the four options provided.

Practice:

野___是一種非常兇猛的動物。

A boar is a kind of very fierce animal.

(1) 渚 (islet) (2) 豬 (pig) (3) 諸 (various) (4) 著 (manifest)

		Pre- test	Post- test	%	р
Exp.	Mean	12.32	15.87	28.81%	*** <.0001
	SD	4.25	3.22		
Con.	Mean	13.21	15.45	16.96%	*** <.0001
	SD	4.28	3.64		

Comprehension

Instructions

There are some sentences below. Some are acceptable while the others are unacceptable. Please read silently and judge whether These sentences are acceptable or not. If you think the sentence is acceptable, put a 'tick' in the bracket, if not, put a 'cross' in the bracket.

Examples

我喜歡吃書本 I like eating books (×)

我喜歡看電視 I like watching TV programs (√)

		Pre-	Post-		
		test	test	%	p
Exp.	Mean	15.55	17.15	10.29%	*** <.0001
	SD	2.72	2.14		
Cont.	Mean	16.46	17.27	4.92%	*** <.0001
	SD	2.76	2.48		

Word Identification

Which of the following is the character 'cun1' in the word 'cun1 tin1' (Spring)?Yes, it's the first one, you're right, so you should circle the option 1. All right, we will now start, and I will read twice for each item. Listen carefully.

Practice: _____ tin1

1) cun1 (Spring) 2) ha6 (Summer) 3) cau1 (Autumn) 4) dong1 (Winter)

		Pre- test	Post- test	%	p
Exp.	Mean	22.82	26.08	14.29%	*** <.0001
	SD	5.08	4.96		
Cont.	Mean	23.58	25.96	10.09%	*** <.0001
	SD	4.9	4.09		

Word Meaning

There are pairs of words in the following. Each pair has one common character. You have to judge whether the common character of the pair of words has the same meaning.

For example, the 'mei5' in 'mei5 lai6' (beautiful) is different from that in 'mei5 gwok3' (United States), so you should put a cross in the bracket.

		Pre- test	Post- test	%	p
Exp.	Mean	12.87	14.73	14.45%	*** <.0001
	SD	2.78	3.67		
Cont.	Mean	13.71	14.24	3.87%	0.110
	SD	3.56	3.38		

Morphological Instruction and Teacher Training in Beijing & Hong Kong

- From various experimental findings, it could be concluded that explicit teaching of the internal structures of Chinese characters would be beneficial to character learning
- A well-structured pedagogy of morphological instruction should enable children to use the structural rules analytically when they are exposed to any new or unfamiliar Chinese characters
- Teachers in Beijing and Hong Kong found the pedagogy of morphological instruction useful for children with dyslexia. They observed that children can make use of such analytic strategies in learning any new Chinese characters, which indicated that they have learned the morphological rules of the Chinese orthography.

Thank You! Dr Alice Cheng

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