



Metalinguistic Awareness

- > Phonological awareness
 - "... ability to reflect on and manipulate basic phonological units of a language..." (Kuo & Anderson, 2006)
- > Orthographic awareness
 - Basic orthographic units of a language
 - Rules that govern the combinations of units
- > Morphological awareness
 - Basic meaningful units of a language
 - Knowledge about word combinations

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Background

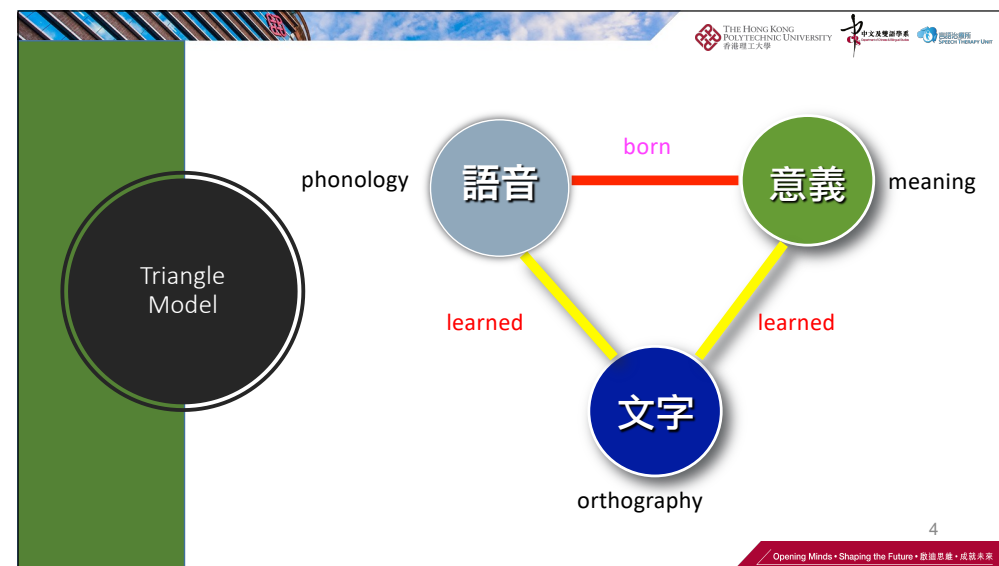
> Roles and Responsibilities of Speech-Language Pathologists in Schools

(<https://www.asha.org/policy/PI2010-00317/>)

"Highlighting Language/Literacy — Current research supports the interrelationships across the language processes of listening, speaking, reading, and writing. SLPs contribute significantly to the literacy achievement of students with communication disorders, as well as other learners who are at risk for school failure, or those who struggle in school settings."

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Predictors
of
Character
Naming

	β	T	ΔR^2
Dependent variable: non-phonetic compounds naming			
Step 1			0.11***
Raven	0.01	0.24	
Step 2			0.28***
Phonological awareness – Rhyme	0.15	2.34*	0.08***
Phonological awareness – Syllable	0.16	2.74**	0.05***
RAN	-0.11	-2.11*	0.05***
Pinyin_Iso	0.14	2.29*	0.04***
Orthographic awareness	0.16	3.09**	0.03***
Pinyin_Real	0.13	2.00*	0.02*
Morphological awareness	0.14	2.33*	0.01*
Dependent variable: Irregular phonetic compounds naming			
Step 1			0.16***
Raven	0.07	1.25	
Step 2			0.30***
Phonological awareness – Rhyme	0.18	3.07**	0.10***
Pinyin_Iso	0.22	3.91***	0.07***
RAN	-0.12	-2.32*	0.05***
Phonological awareness – Syllable	0.1	1.86	0.03***
Orthographic awareness	0.18	3.75	0.03***
Morphological awareness	0.14	2.54*	0.01*
Pinyin_Real	0.1	1.76	0.01*
Dependent variable: Regular phonetic compounds naming			
Step 1			0.10***
Raven	0.02	0.29	
Step 2			0.22***
Phonological awareness – Rhyme	0.24	3.66***	0.12***
Pinyin_Iso	0.24	3.66***	0.10***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

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Lau, Leung, Liang & Lo (2015)

Phonological Awareness (PA)

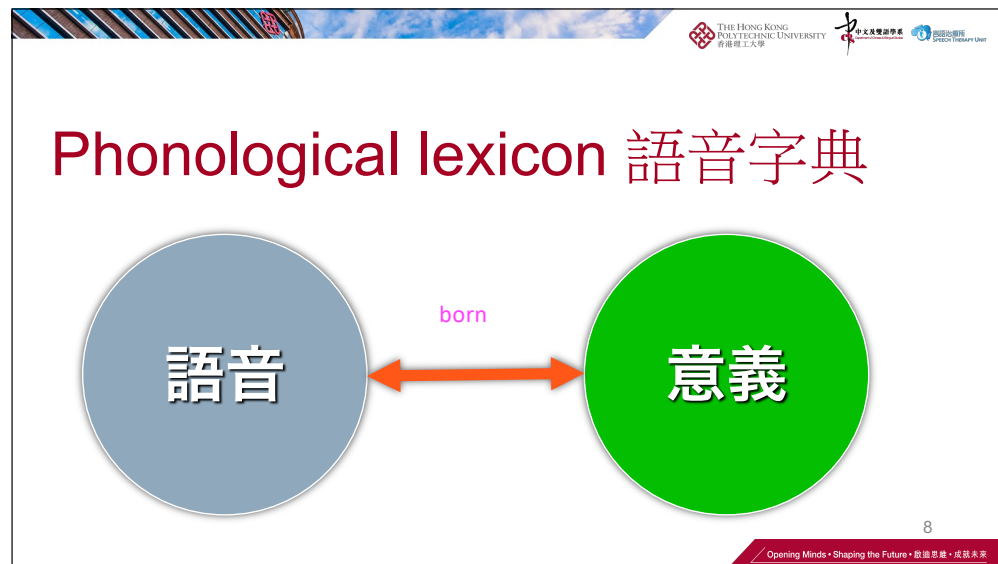
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Phonological Awareness (PA)
ARA

Morphological Awareness (MA)
AMA

Orthographic Awareness (OA)
AWA

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Phonological Mediation Hypothesis & GPC rules



Grapheme-Phoneme Conversion rules

CAT ↔ /k æ t /

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Is GPC rules applicable to Chinese?

- In English the smallest writing unit is letter which could corresponds to phoneme. (e.g. PIG : /p l g/). In Chinese, the smallest writing unit which correspond to sound is phonetic radical. Its corresponding unit is syllable (e.g. 驢: 馬, 盧). Therefore, grapheme correspondences identical to English GPC rule is not possible in Chinese.
- Instead, studies indicate that the script-sound association is governed by OPC rule (Orthographic Phonological Conversion rule)

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GPC rules

Context-sensitive rules ^a		
gu[V]	g	b
n[k]	N	A
[q]u	w	m
g[e]	-	b
c[e]	s	A
c[i]	s	A
c[y]	s	A
[V][C]ed	d	c
[V][C][C]	d	c
[V][C][C][C]ed	d	c
Single-letter rules		
a	{	b,m
a	#	e
b	b	A
c	k	A
d	d	A
e	E	b,m
e	i	e

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OPC rules

Regularity rule

- Governs the relations between the pronunciations of the phonetic radical and whole character

Consistency rule

- Governs the phonological realisations of the family members of the characters sharing identical phonetic radical

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Regularity

Whole character

Phonetic radical

清

cing1

cing1

概

koi3

gei3

Regular (R) Irregular (IR)

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The poor development of OPC rules due to poor PA

- Regularity rule
- Consistency rule

Reading difficulties

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Consistency

One realization 僚 遼 僚 療 寮 Consistent (C)

Five realizations 苔 始 治 冶 怡 Inconsistent (IC)

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Foster development of OPC rules

- Regularity rule
- Consistency rule
- Flexible use of the two rules

ARA

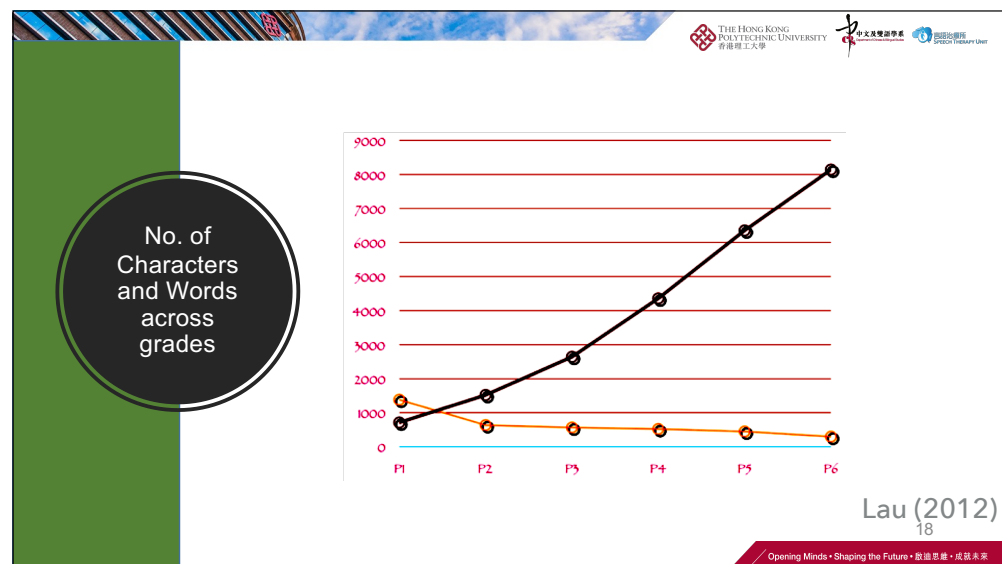
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Error Analysis

Client 1	Target	Production	Student's analysis	Correct or not?
Client 1	碩 (RC)	頭	OAP	
	豫 (RC)	象	OR	
Client 2	撕	其	OR	
	值	正	MA	
	鬚	髮	WP	
Client 3	棕	容	NS	
	咕	朱	MA	
	催	電	MA	



Phonological Awareness (PA)

ARA

Morphological Awareness (MA)

AMA

Orthographic Awareness (OA)

AWA

Morphemes

Smallest meaningful units of the language

- E.g. “Unchangeable”
- E.g. “月餅” /jyut6 beng2/ [mooncake]

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Morphological awareness

Manipulations of morphemes

- e.g. 龜、速、九十

Structure of words

- 龜速
- 九十後

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Words can be classified as...

Monomorphemic words

- e.g. 手、狗

Multi-morphemic words

- e.g. 手錶、耳環、狗公園

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Morpho-syntax

Compare the following:

- 「龜速」 vs 「速龜」
- 「潮童」 vs 「童潮」

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Different meanings

Compare the following:

- 「潮童」 vs 「童潮」
- 「潮」：潮流
- 「潮」：人流

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Boundedness

Free morphemes

- Can standalone as words
- E.g. 車、手、杯、木、腦

Bound morphemes

- Can't standalone as words
- E.g. 蟑螂、玫瑰、吝嗇、徘徊

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Morpho-syntactic structures

Classified as

- 偏正 (e.g. 飛機、電腦)
- 聯合 (e.g. 閱讀、朋友)
- 述賓 (e.g. 出版、彈琴)
- 述補 (e.g. 推廣、打開)
- 主謂 (e.g. 民主、人為)

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Free vs Bound

Is the morpheme “謙” free or bound?

	小一學生	中一學生
Exposure	謙虛	謙虛、謙讓、謙卑、謙遜
Result	「謙」是黏著	「謙」可以有獨立意思

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Boundedness as a dynamic concept

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車、馬、白、...
白馬、馬車、白車、...

In short...

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By promoting

- Non-productive → productive
- Bound → Free

To improve word learning abilities

Some interesting observations

- 潔 → 清 (清潔)
- 耍樂 → 玩樂 (玩耍)
- 捕 → 魚 (捕魚)
- 兔 → 白 (白兔)

Lau & Leung (2013)

The AMA
study

Effect on boundedness

Preliminary
results

	Treatment Group				Control Group			
	Bound Morphemes		Free Morphemes		Bound Morphemes		Free Morphemes	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pretreatment (max = 36)	3.8	1.9	4.7	2.8	4.0	1.6	4.5	2.2
Posttreatment (max = 36)	8.3	4.7	13.9	6.8	4.6	1.9	4.8	2.5

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Effect on boundedness

Preliminary results

	Treatment Group				Control Group			
	BB Words		FF Words		BB Words		FF Words	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pretreatment (max = 18)	5.1	3.4	7.5	3.0	5.0	3.5	7.2	2.9
Posttreatment (max = 18)	8.9	5.0	13.0	5.4	6.5	3.9	7.6	3.4

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Effect on reading abilities

Preliminary results

	Treatment Group		Control Group	
	Mean	SD	Mean	SD
Pretreatment (max = 150)	44.8	15.6	48.4	14.6
Posttreatment (max = 150)	61.8	19.8	61.5	20.2

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Effect on semantic transparency

Preliminary results

	Treatment Group				Control Group			
	Opaq-Words		Trans-Words		Opaq-Words		Trans-Words	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pretreatment (max = 24)	8.6	3.8	11.2	5.0	8.5	3.5	10.2	4.5
Posttreatment (max = 24)	14.8	5.4	20.1	6.3	9.4	3.7	11.4	4.4

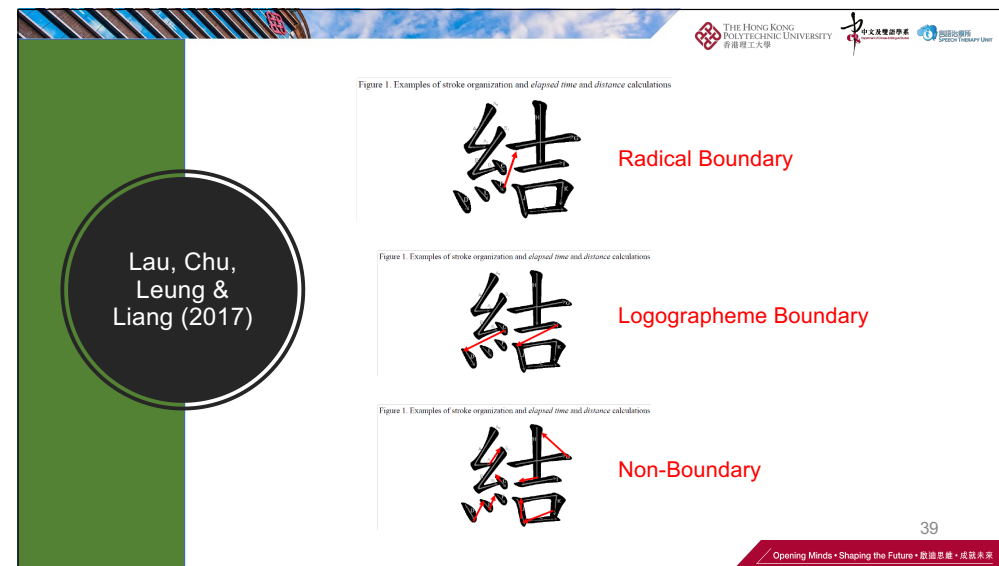
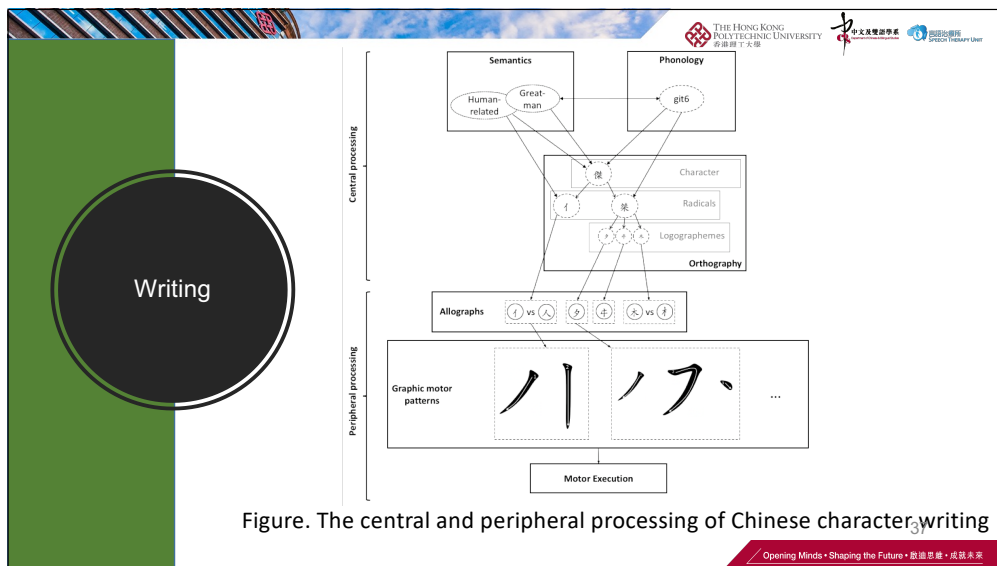
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AMA promotes morphological awareness

Discussion

Further studies on how improved morphological awareness promotes word learning and reading comprehension needed

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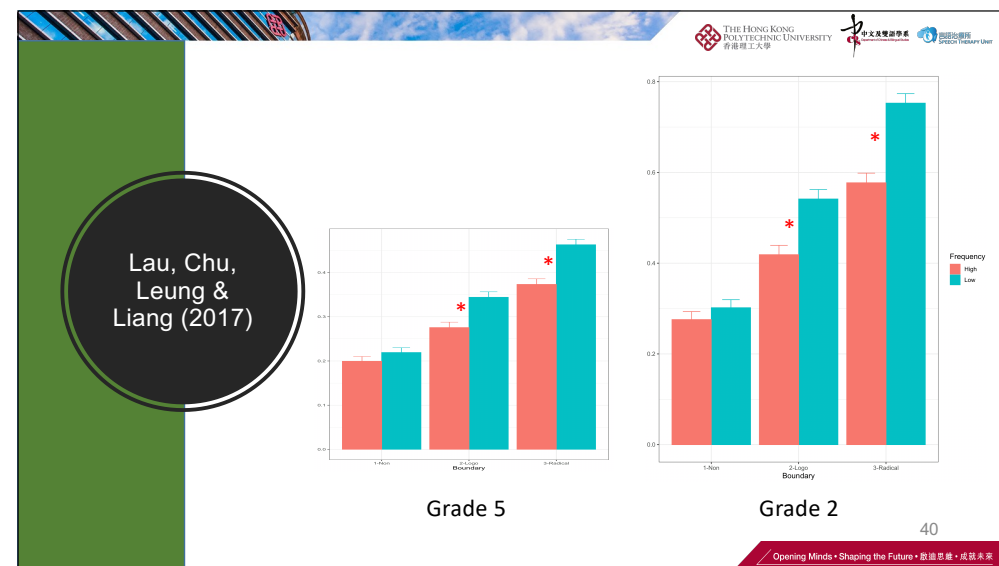
Lau & Yuen (2019)

A patient (CSC) who produced left-hand mirror writing

Table 7. Excerpt of CSC's handwriting

	Real characters	Pseudo characters	Non-characters	Hangul	Line Drawing
Targets	垮	嶠	嶠	땃	ㄅ
CSC's output	ㄅ	ㄅ	ㄅ	땃	ㄅ
Targets	瀉	嬌	嬌	삭	ㄱ
CSC's output	ㄱ	ㄱ	ㄱ	삭	ㄱ

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Errors in writing

Table 1. The written output of a child with dyslexia in a copying task. The order of stroke sequence was indicated next to the onset position of each stroke.

	Target pseudo-character	Child's output
Example A	𩚑	
Example B	𩚒	

Example 3 Central processing

螢



Example 4 Central processing

落



Example 5 Central processing

奪



Example 6 Central processing

落



Table 2. The written output of children with dyslexia in a writing-to-dictation task.

	Loci of writing problems	Target character	Children's written output
Example 1	Peripheral processing	捉	
Example 2	Peripheral processing	跟	

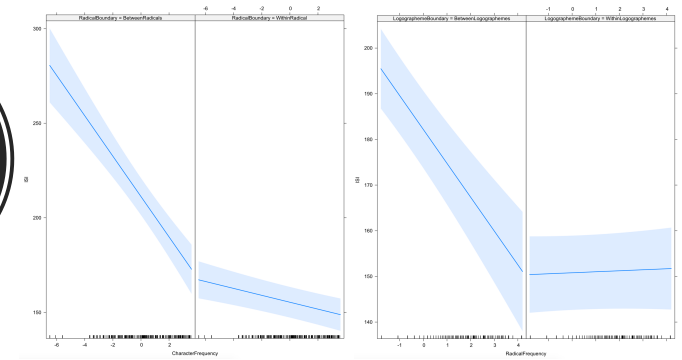
Possibly indicating different loci of writing problems

More...

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Character copying task (adult participants)

Wong & Lau
(2019)



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Character copying task (adult participants)

Wong & Lau
(2019)

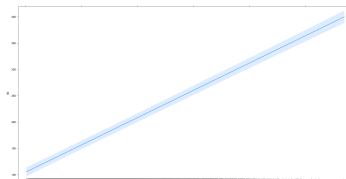
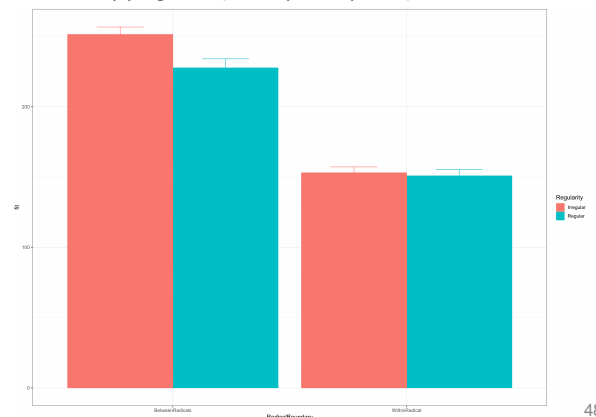


Fig. 1. Examples of (i) an iterative radial (ISD) as a topographic boundary, (ii) an ISD as a radial boundary, and (iii) an ISD as a topographic boundary.

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Character copying task (adult participants)

Wong & Lau
(2019)



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What about kids? Future studies
needed...

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To summarize

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Different training for different loci of
problem

Implication

Repeated practice of character
copying may not work

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There are a lot STs can do in the
area of reading and writing

Summary

School teachers and Principals

- Please discuss with your speech
therapists

Speech therapists

- Please feel free to discuss with us

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