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Towards a Model of Second Language Word Production and Recognition in Mandarin

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Aim of the study

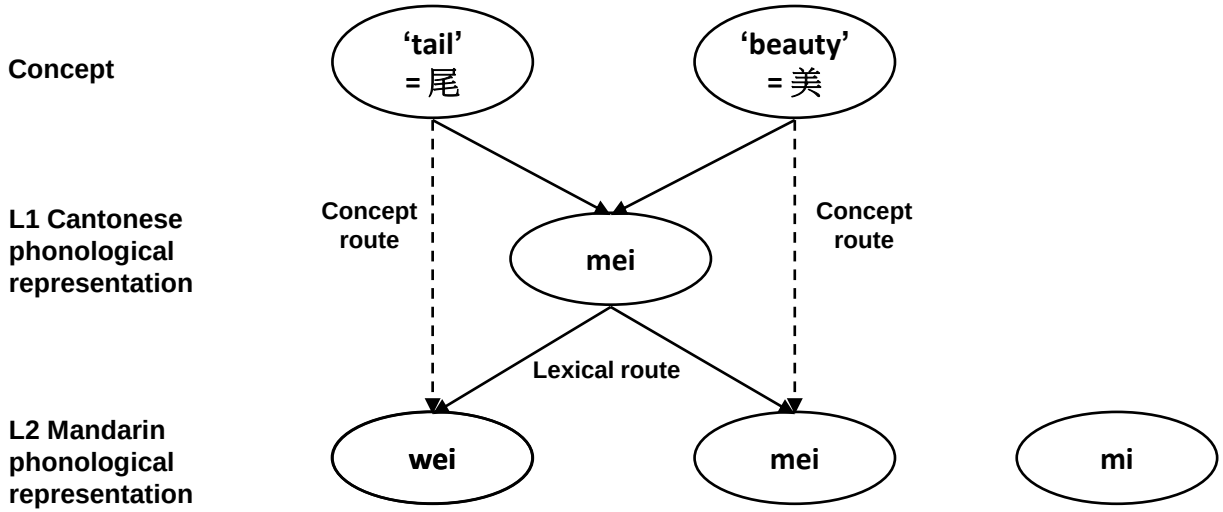
- Understand how Cantonese speakers' production and recognition of second language (L2) Mandarin words is influenced by the first language (L1) lexical system

Pronunciation relationships between Cantonese and Mandarin words

- There are many homophones (同音字) in Cantonese and Mandarin

Character / meaning	聲 'sound'	星 'star'	尾 'tail'	美 'beauty'
Cantonese pronunciation	/sing/		/mei/	
Mandarin pronunciation	/sheng/	/xing/	/wei/	/mei/

'sound' 聲音 /shengyin/ → /xingyin/
'tail' 尾巴 /weiba/ → /meiba/



Pronunciation relationships between Cantonese and Mandarin (Zhang & Gao, 2000)

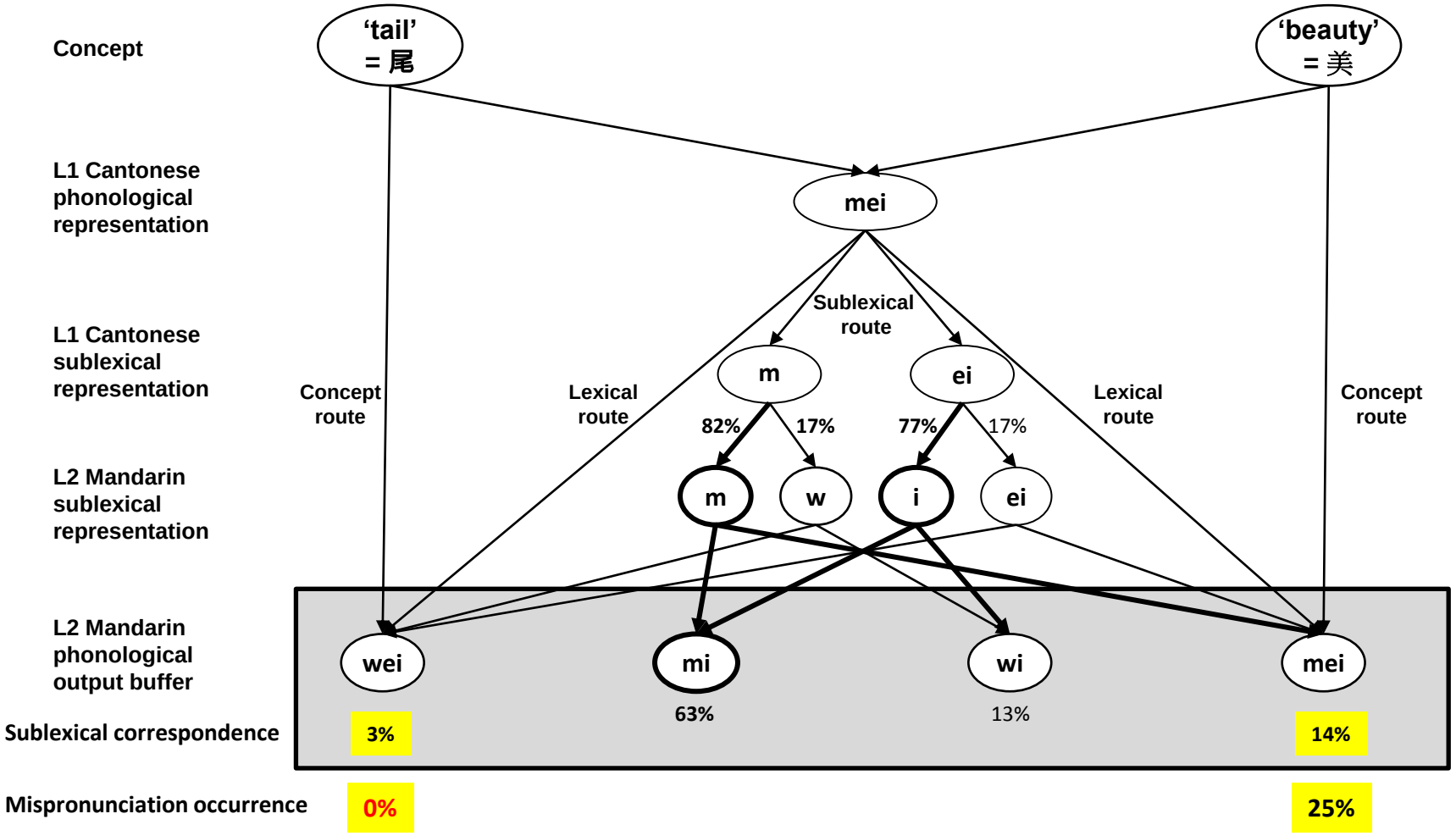
Cantonese onset (聲母) /m/

Mandarin onset	Number of words	Percentage	Example	Cantonese pronunciation	Mandarin pronunciation
m	160	82%	媽 'mother'	*maa1*	*ma1*
w	33	17%	萬 'ten thousand'	*maan6*	*wan4*
b	2	1%	剝 'to shell'	*mok1*	*bo1, bao1*

Cantonese rime (韻母) /ei/

Mandarin rime	Number of words	Percentage	Example	Cantonese pronunciation	Mandarin pronunciation
i	99	77%	皮 'skin'	*pei4*	*pi2*
ei	26	20%	悲 'sad'	*bei1*	*bei1*
in	1	1%	您 'you'	*neii5*	*nin2*
ü	1	1%	履 'shoes'	*lei5*	*lü3*
er	1	1%	餌 'bait'	*lei6*	*er3*

L2 Mandarin word production model



Correlation between **sublexical correspondence** and **mispronunciation occurrence** = **0.35**, *p* = .005
(Chu & Taft, LSHK ARF 2010)

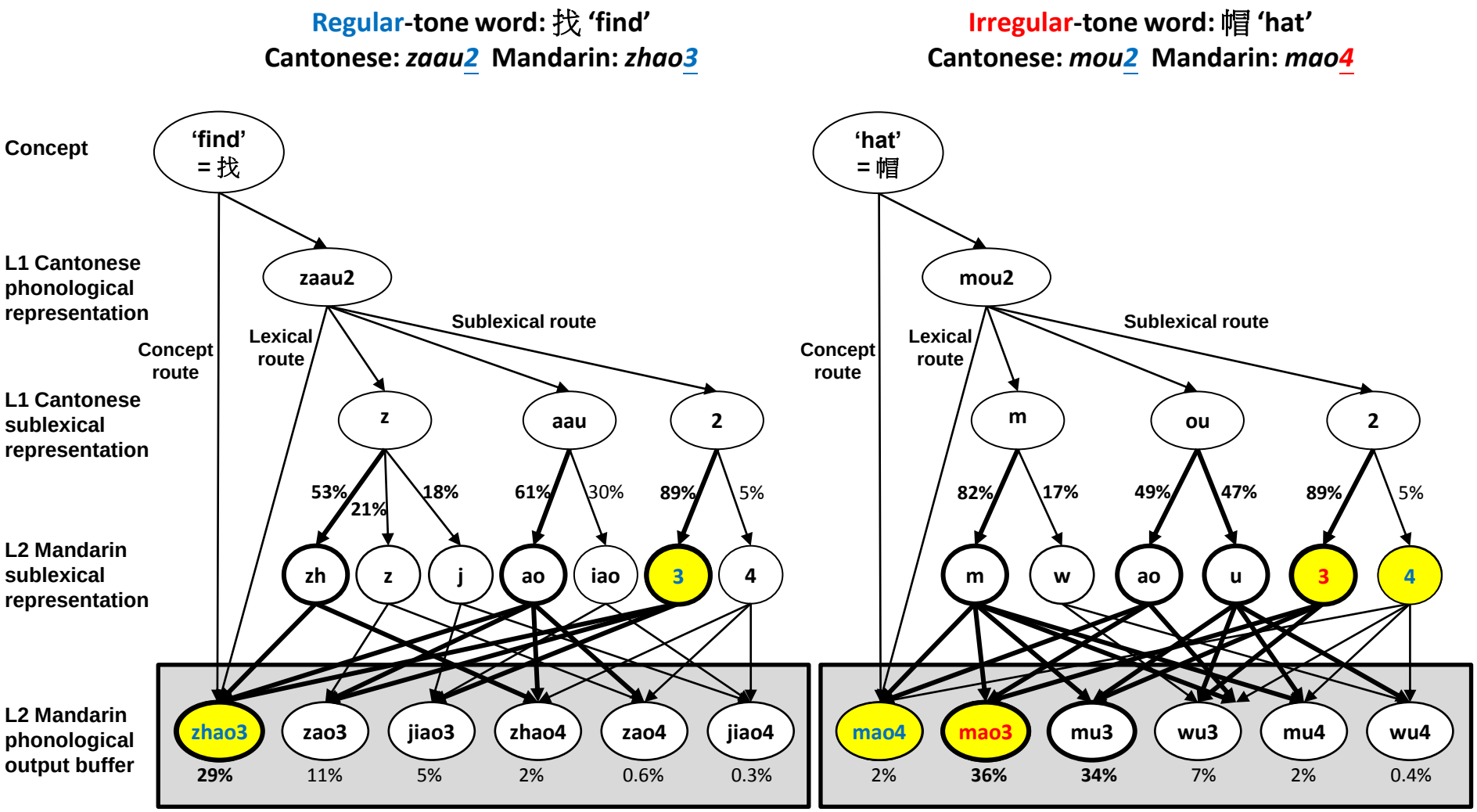
Major tone relationships between Cantonese and Mandarin (Zhang & Gao, 2000)

Cantonese tone	Mandarin tone	Percentage	Example	Cantonese / Mandarin pronunciation	Exception	Cantonese / Mandarin pronunciation
1	1	93%	郊 'suburb'	*gaau1 / jiao1*	魔 'devil'	*mo1 / mo2*
2	3	89%	找 'find'	*zaau2 / zhao3*	帽 'hat'	*mou2 / mao4*
3	4	91%	怪 'strange'	*gwai3 / gwai4*	傘'umbrella'	*saan3 / san3*
4	2	93%	牛 'cow'	*ngau4 / niu2*	微 'little'	*mei4 / wei1*
5	3	76%	偉 'great'	*wai5 / wei3*	市 'city'	*si5 / shi4*
6	4	94%	又 'again'	*jau6 / you4*	捕 'catch'	*bou6 / bu3*

Regular-tone

Irregular-tone

L2 Mandarin word production model: Incorporating the tone component

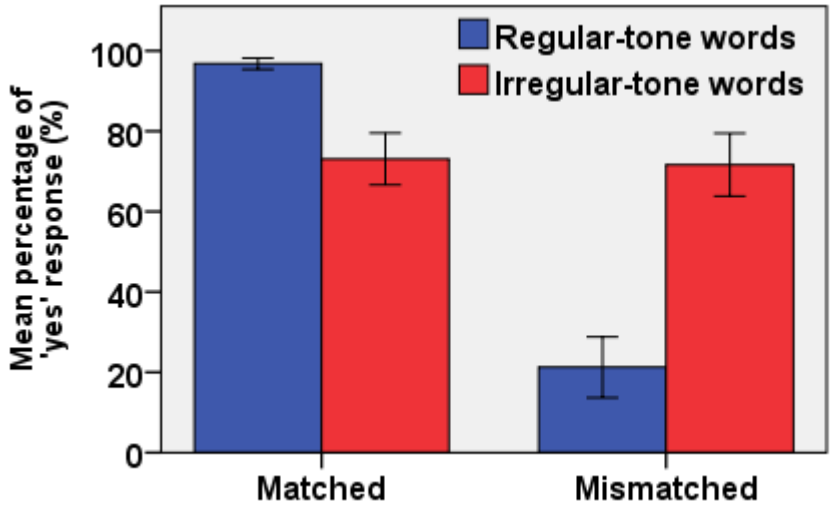


Chinese character – Mandarin sound matching task
(Chu & Taft, ICPhs 2011)

- Materials

Word Type	Matched	Mismatched
Regular-tone words (e.g. 找 'find' Cantonese: *zaau2*)	*zhao3*	*zhao4*
	>	<
Irregular-tone words (e.g. 帽 'hat' Cantonese: *mou2*)	*mao4*	*mao3*

- Dependent variables - Percentage of 'yes' responses

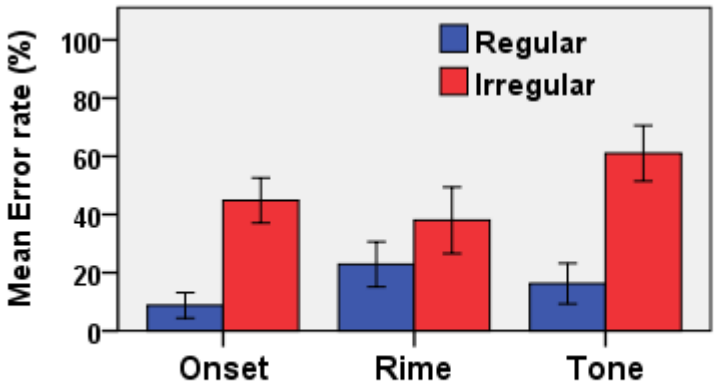


Further evidence for the use of the sublexical route in L2 Mandarin word production

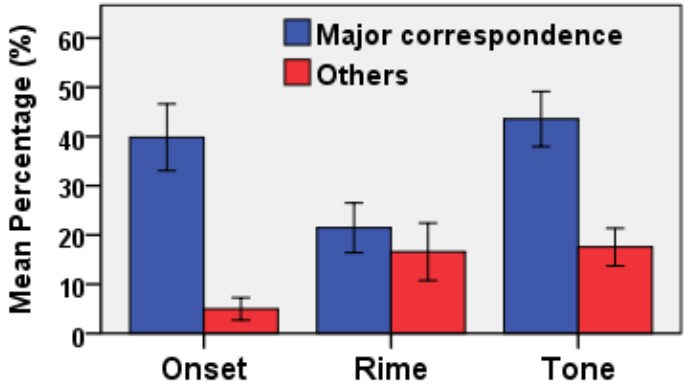
- Mandarin *pinyin* transcription task (Chu & Taft, EPC 2011)

Sublexical unit	Cantonese pronunciation	Regular word		Irregular word	
		Mandarin pronunciation (% correspondence)	Example	Mandarin pronunciation (% correspondence)	Example
Onset	d	d (96%)	對 'correct'	t (2%)	突 'sudden'
Rime	aai	ai (59%)	帶 'bring'	a (2%)	拉 'pull'
Tone	Tone 4	Tone 2 (93%)	農 'farm'	Tone 4 (4%)	期 'period'

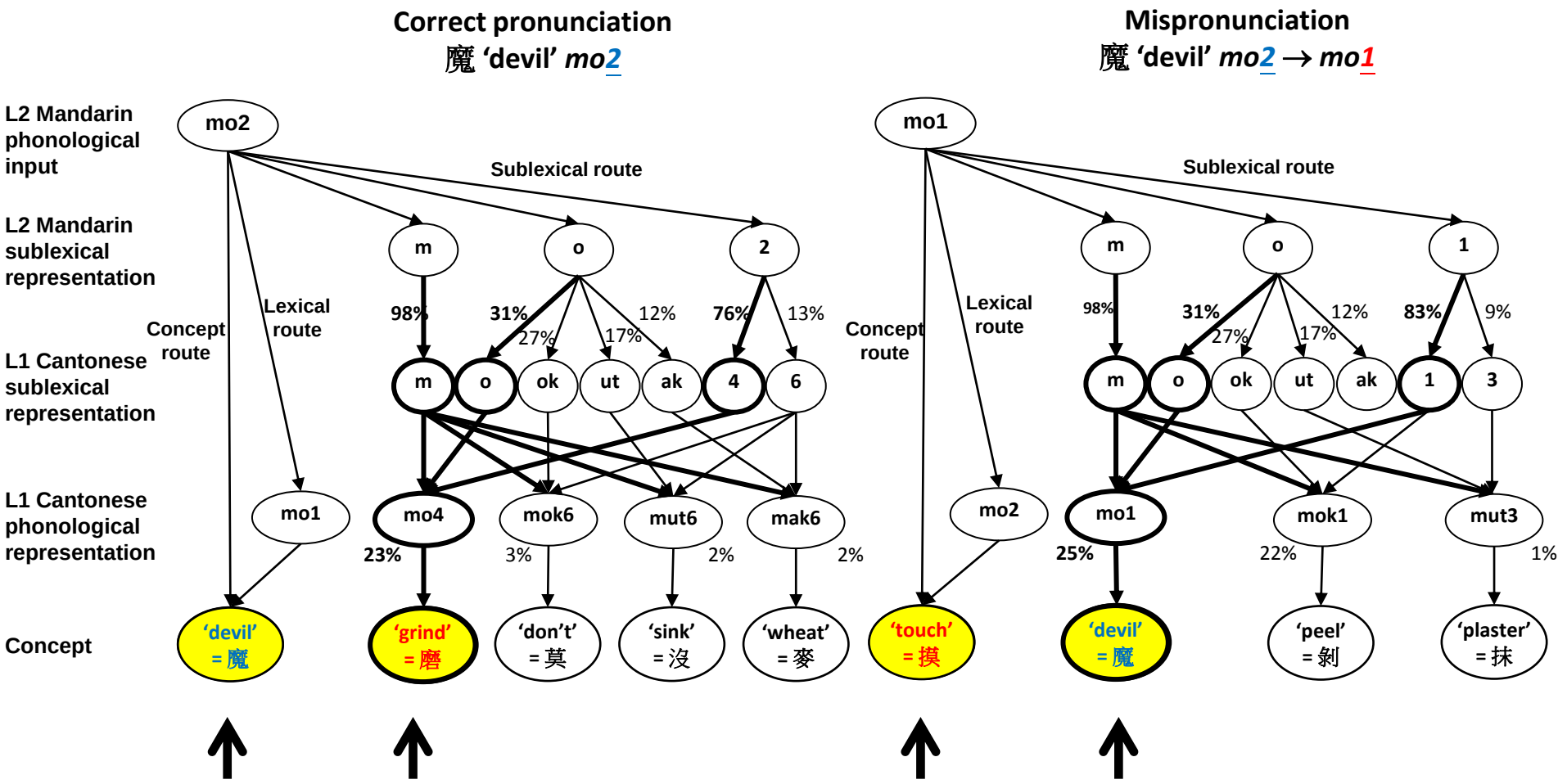
Mean error rate



Error analysis of irregular words



L2 Mandarin word recognition model



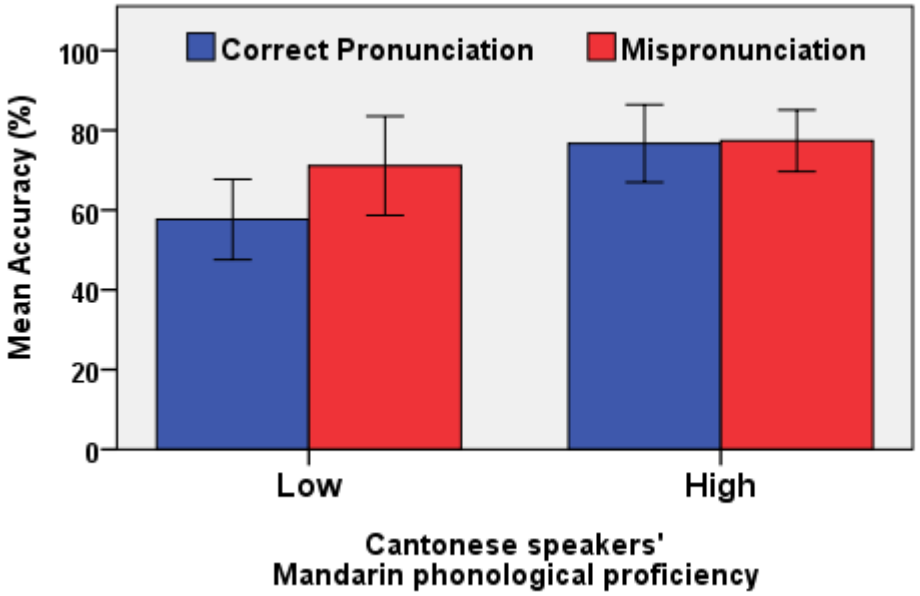
Empirical evidence for the L2 Mandarin word recognition model

- Disyllabic word transcription task (Chu & Taft, ISB 2011)

  魔鬼 'ghost'

  – Correct pronunciation: *mo**2**gui3*

  – Mispronunciation: *mo**1**gui3* (nonword 摸鬼)



Conclusion

- Three-route L2 word production and recognition model:
  - Concept, lexical and sublexical
- Beginning learners
  - Use sublexical route in both L2 word production and recognition
- Advanced learners
  - Shift from sublexical to lexical/concept route in L2 word production
  - Use both sublexical and lexical/concept route in L2 word recognition
- Future research
  - Lexical decision with cross-modal priming
  - Eye-tracking paradigm with visual-world paradigm
  - Event-related potential (ERP)