

Levels of analysis in the generalization of Chinese character regularities

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Chinese character “phonology”

- Duality of patterning: recurring elements

能 月 公 北

- Recursion (Sproat, 2000)

鱗 魚 → [米! 夕! 牛!]

- Rules (Wang, 1983)

牛 → 特 cf. 牢

- “Prosody”: global shape constraints (Myers, 1996)

Reduplication patterns

- Binary horizontal reduplication
林 比 競 朋 弱 嚇 雙 選 窳 替 質 瑩
- Binary vertical reduplication
昌 呂 圭 夔 多 炎 哥 棗 芻 患 僵 漆
- Triangular reduplication (binary both ways)
品 崧 鑫 蟲 晶 晶 森 轟 众 磊 轟 犇

- These generalizations are (never) violated

Non-binarity: 三 巡 黑 州 靈

Inverted triangles: * 卍 cf. 焚

Semantic radical position

- Radicals prefer left or top positions

位 她 棒 詞 安 笑 病

- Radicals in left/top positions are reduced

人:位 心:忙 水:泊 手:拾 竹:筆 艸:花

- Radicals not reduced in bottom/right positions

忘:忙 處:泊 拿:拾 功:加

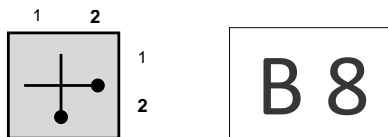
- Many exceptions to position or reduction:

獨 盒 刀:刻 火:熟

Character prosody

- Global shape constraints (Myers, 1996)

- Binarity
- Prominence at right and bottom
- Similar to spoken/sign metrical feet
- Universal biases in motor control, vision, cognition?

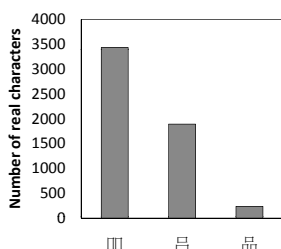


Levels of analysis

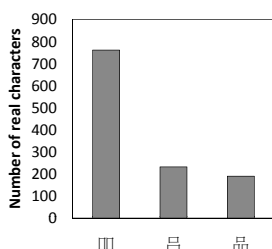
- We'll see that these patterns are productive
- But what's the proper level of analysis?
 - Prosody
 - Analogy
 - Concrete patterns (i.e., no abstract template)
- Discriminating among levels
 - Do patterns go beyond mere frequency effects?
 - Do reduplication and radicals share processes?

Reduplication type frequencies

Including radicals and always reduplicated forms



Not including radicals or always reduplicated forms

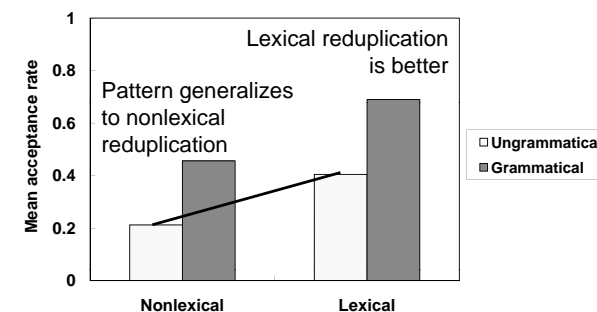


Testing reduplication

- Grammaticality: Obey/violate patterns
- Lexicality: Reduplication in/not in real characters
- Shape: Horizontal, Vertical, Triangular
- Speeded binary good/bad judgments

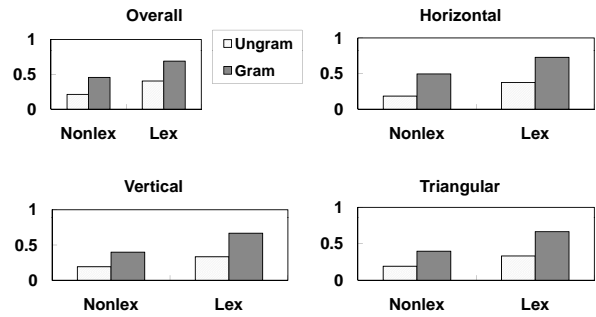
Shape	+Lex+Gr	+Lex-Gr	-Lex+Gr	-Lex-Gr
Horizontal	蒜	蒜	莖	莖
Vertical	侈	侈	徠	徠
Triangular	灑	灑	潑	潑

Reduplication judgments



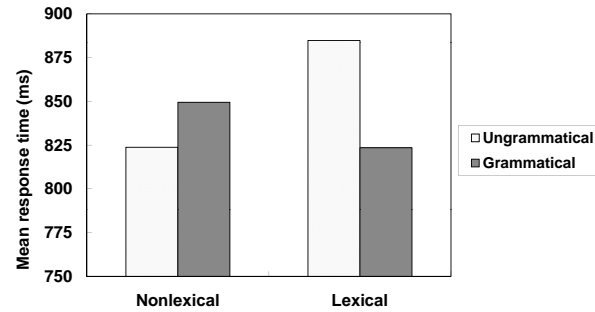
No interaction: Pattern is strong But so is analogy

Reduplication judgments by shape



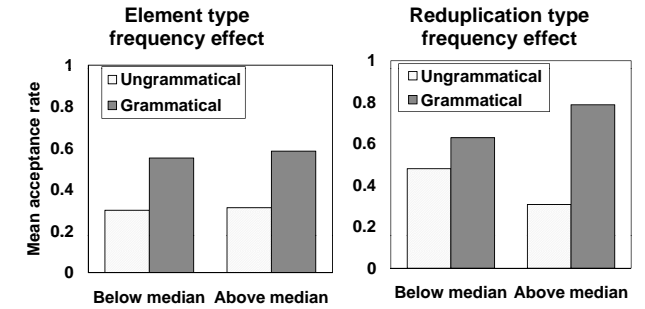
Triangular pattern generalizes least (due to its low frequency?)
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Reduplication response times



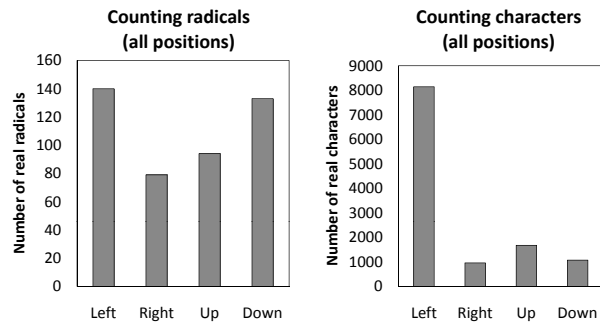
Interaction: Judgment of **lexical** reduplication is **lexical decision**;
Judgment of **nonlexical** reduplication is **violation detection** 11

Frequency and lexical reduplication



Effect of reduplication frequency, not element frequency:
Judgment of lexical reduplication is surface-based 12

Radical position type frequencies



With help of
http://commons.wikimedia.org/wiki/Commons:Chinese_characters_decomposition 13

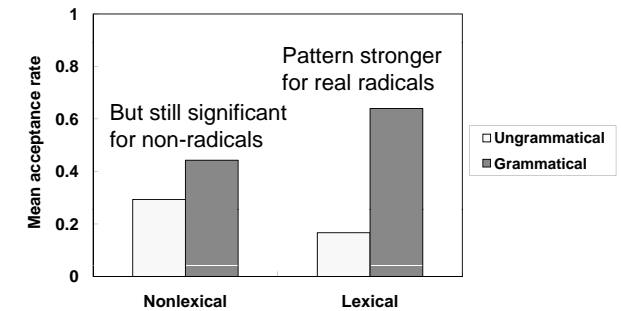
Testing radical position

- Grammaticality: Obey/violate patterns
- Lexicality: Real/non-radical (all real elements)
- Shape: Horizontal, Vertical
- Speeded binary good/bad judgments

Shape	+Lex+Gr	+Lex-Gr	-Lex+Gr	-Lex-Gr
Horizontal	稜	𪛗	𪛗	𪛗
Vertical	𪛗	𪛗	𪛗	𪛗

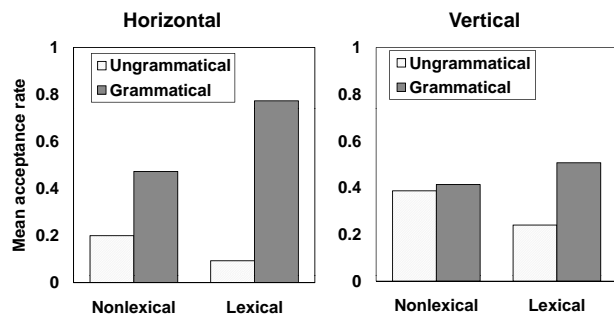
(See Myers, 2011, for more method details) 14

Radical position judgments



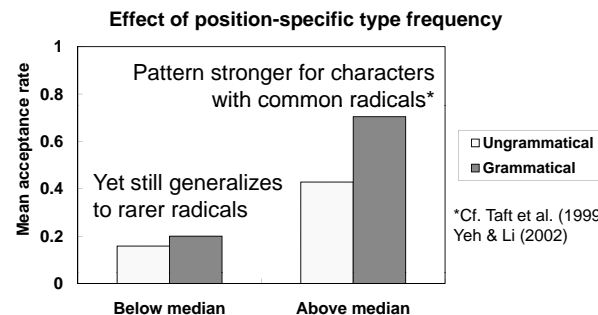
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Radical judgments by shape



No generalization of vertical pattern (due to its low frequency?)
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Frequency and lexical radical position



*Cf. Taft et al. (1999),
Yeh & Li (2002)

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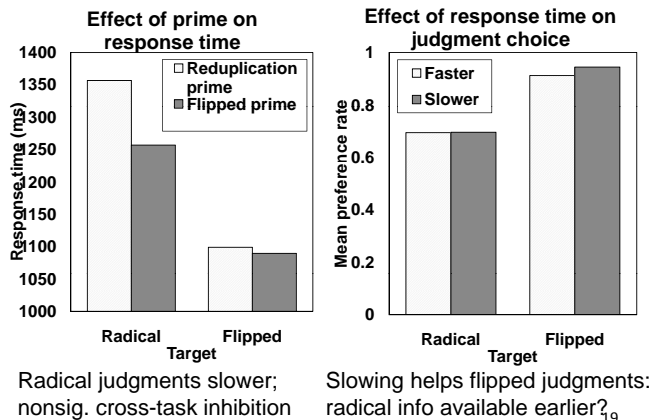
Testing cross-pattern priming

- Do reduplication and radical judgments recruit the same prosodic processes?
- Prime: Good vs. violation of reduplication/other
- Target: Good vs. violation radical position/other
- Speeded forced choice (preference for good)

item)	Contrast	Prime pair		Target pair
Prosodic		𪛗 𪛗	x	𪛗 𪛗
Flipped		𪛗 𪛗		𪛗 𪛗

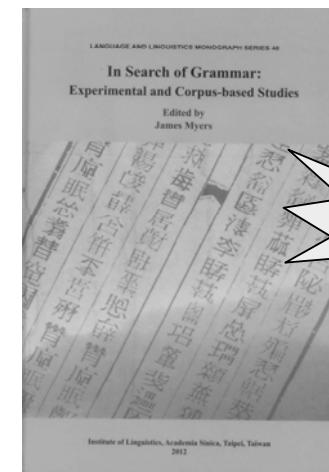
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Results: Not very helpful



Conclusions

- Character prosody does generalize
- Generalizability is sensitive to frequency
- Yet it goes beyond mere analogy
 - Applies to never reduplicated/non-radical elements
- Even analogical effects are like “real” phonology
 - E.g., Bailey & Hahn (2001) and many others
- Prosodic priming doesn’t work (yet)
 - Any other paradigm from “real” phonology? (Do Tagalog reduplication and stress use the same feet?)₂₀



(Myers, 2012)

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