Transposed Radical Priming Effects in Chinese

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Introduction

- The transposed letter effect in alphabetic languages
  - Transposed-letter nonwords can produce large masked priming effects in alphabetic languages

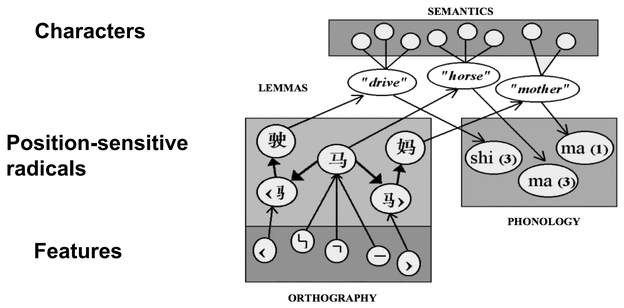
    jugde – JUDGE
  - Letter positions appear to be coded in a flexible fashion in those languages.

Chinese Characters

- Chinese characters consist of radicals
- Some are free radicals and some are bound radicals
- Also, some are character radicals (i.e., the can be characters themselves) and some are non-character radicals

如　　彭

- Are Chinese radicals coded flexibly and do character and non-characters radicals get coded differently?
- The position-sensitive vs. position-general view of radical representation in Chinese character recognition
  - The position-sensitive view (Taft, 2006) predicts no priming from transposed radical characters

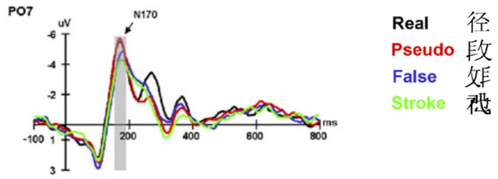


The Present Experiment

- Is there is a transposed radical effect in Chinese (in masked priming and ERP data) and, if so, does it differ for character radicals versus non-character radicals?

ERP Components in Reading Chinese

- Lin et al. (2011)
- Posterior N1/N170: orthographic processing



Real 径
Pseudo 段
False 姹
Stroke 卍

- Real and pseudo characters elicit a larger N170 than false characters and strokes

Method

Participants

- Thirty-two Mandarin Chinese native speakers
  - mean age = 19.2
  - lived in Canada for less than one year

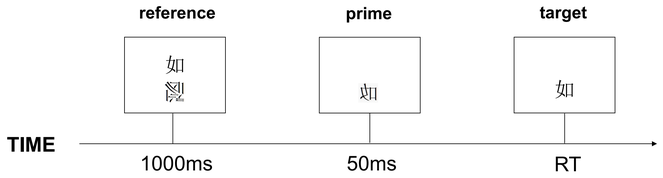
Stimuli

- **Same trials:**
  - 120 Chinese characters
  - left-right structure, consist of two free radicals
  - 60 characters had radical characters, 60 radicals had at least one non-character radical
  - used both transposed radical and repetition primes
- **Prime types:**

	character radicals		non-character radicals	
	related	unrelated	related	unrelated
repetition	如	规	彭	靖
transposed	如	赅	彧	靜

Procedure

- ERP with masked priming same-different task

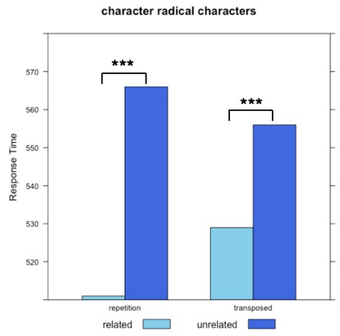


Results

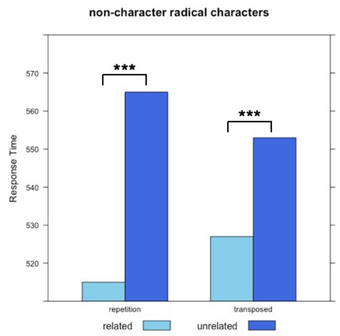
Behavioral Data

- **Same trials: Equivalent transposed character and repetition priming effects**

Character radicals



Non-character radicals



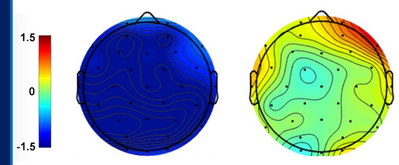
Results - ERP

ERP Data

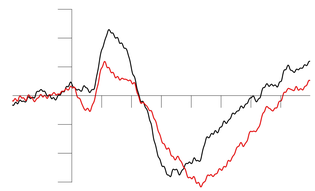
Same Trials: Somewhat different priming effects

Character radicals

Repetition　Transposed

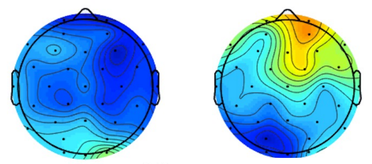


N170: 100-220 ms　N170: 100-220 ms



Non-character radicals

Repetition　Transposed



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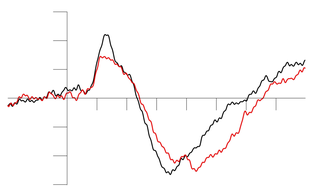

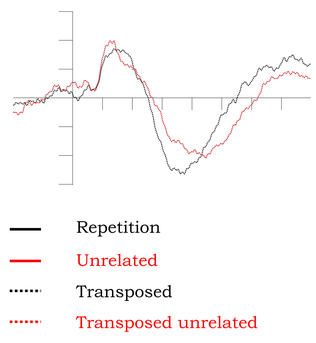

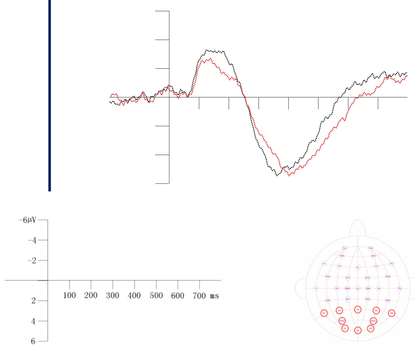

Repetition
Unrelated
Transposed
Transposed unrelated

Discussion

- There is a transposed radical priming effect in Chinese, providing evidence for a position-flexible view of radical representation in Chinese character representations.

Character radical characters vs. non-character radical characters

- Behavioral: no difference
- ERP: transposed radical priming effects in the N170 area only showed up for non-character radical characters
- Transposed radical priming for character radical characters only showed up later in processing
- Character radicals may be similar to morphemes in alphabetic languages while non-character radicals are similar to letters, hence character radicals only provide morphological priming.