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Syllabic tone articulation influences the identification and use of words during Chinese sentence reading: Evidence from ERP and eye movement recordings

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2 2015

Abstract

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400

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Keywords

(, , & , 2005, & , 200 ,
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minimality hypothesis,

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, & , 2001)—

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& , 2014 & - , 1 , 2000, 200).
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, 柴火 (-

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. (2014),

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(& , 2010 , , ,
, & , 2004)

Experiment 1

100 250

(& , 200 & ,
200),

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400

400

. (2014).
400

Method

Participants

32 (1 ,
14) 1 2 (22)

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Material

(. .,
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(1), $F < 1$.

(& , 2010). ,

3. (*SD* 0. 3) 3. (*SD*
0. 4) 5- (12)
$F(1, 112)$ 1.102, p .2 , 1

5. 1 (*SD* 1.22) .02 (*SD* 1.0)
$F(1, 112)$ 0. 3 , p .335 , (2).

( ).

Table 1

– 1 (. 1)				
	2.5	1 .	2. 4	1 .
SD	1. 5	5.	1.24	5.5
– 1 (. 2)				
	2.	1 .3	2.	15.0
SD	1.4	5.	1.2	4.2
	2.0	1 .1	2.03	1 .3
SD	0. 2	4.0	0.	3.
+ 1 (. 2)				
	2.	1 .3	2.	15.5
SD	1.1	3.	1.02	4.4

10

Table 2

( )	233	2 1
( )	4.	5.4
	3.	3.
(5-)		
( )	5. 1	.02
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114

(. ., *shi-huan*), ,

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(. , 2004). , (. , 2013), (& , 2005). -

(. .,) -

(233 . 2 1), $F(1, 112)$ .003, $p < .001$,

(4. . 5.4), $F(1, 112)$ 1. 3 , p .055, -

(2).

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(. 1).
, 10 1 , - -

—
, (, *SD* 0.).
— , *pretarget words*—
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(1), p .3.
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( )
3 55 , (% 4 %,)
$F(1, 112)$ 1.43 , p .233 2 . , 1
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- - , p .1, -
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Procedure

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500 , 200- ,
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114 , -
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very easy *very difficult*.

Neutral tone condition					
Chinese	老板	总是	使唤	秘书	来 帮忙 处理 私事。
Interest Regions		Pretarget	Target	Posttarget	
Pinyin & Tone			shi3 huan		
Literal Translation	Boss	always	order around	secretary	to help conduct private business
Translation	The boss always bossed the secretary to help take care of his private business.				
Full tone condition					
Chinese	会计	经常	使用	算盘	来 核对 账目。
Interest Regions		Pretarget	Target	Posttarget	
Pinyin & Tone			shi3 yong4		
Literal Translation	Accountant often		use	abacus	to check accounts.
Translation	The accountant often used abacus to check accounts.				

Fig. 1

1.4 ($F < 1$) (2, 4). 15 1, 000 (/) (& , 1) (. ., , , , & , 2014).

EEG recordings

( ) 10–20 , (, ,). ( ) 5 Ω. 0.01 - 100- 500 . (, . ., , , , , & , 2012 ., 2014)

15 (. 2) (1, 3), - (1, 3), (1, 3), - (1, 3), (1, 3), ( ), - ( ), ( ), - ( ), ( ), (2, 4), - (2, 4), (2, 4), - (2, 4),

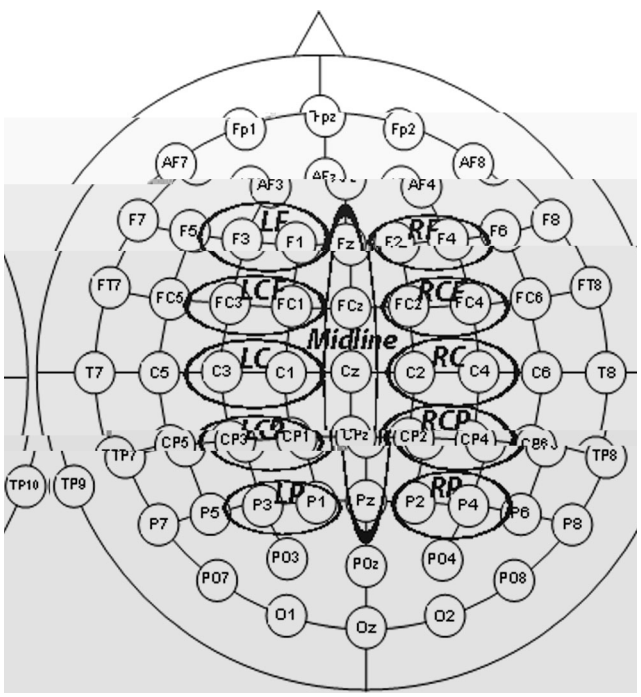


Fig. 2

Data analysis

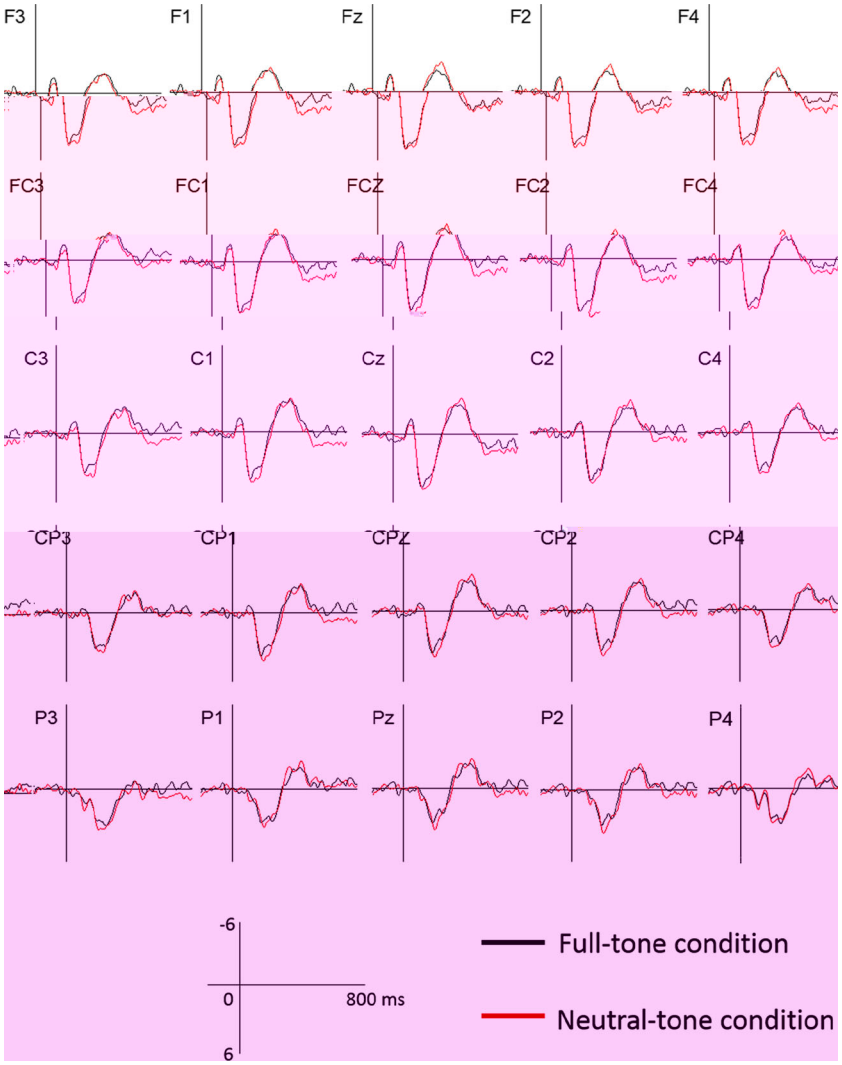


Fig. 3 -

- - , -

. 250 .

N250 250 , b 0.41 μ , SE 0.12, t 3.4 . (- -
. 4, 250) –
200 . - -
400 , 250 - ,
(, , , b –0.21 μ , SE 0.10, t 2.12.
, & , 2010 , , , & 100 , , -
, 200 & , 2012). 100
, 100, b 0.12 μ , SE
- - , b 0.34 μ , 0.04, t 3.1 . , 250
SE 0.11, t 3.00.
– , b –0.25 μ , –
SE 0.0 , t 3.12. . , , b 0.31 μ , SE 0.11, t 2. 5, b –0.24 μ ,
- SE 0.0 , t 3.0 , .

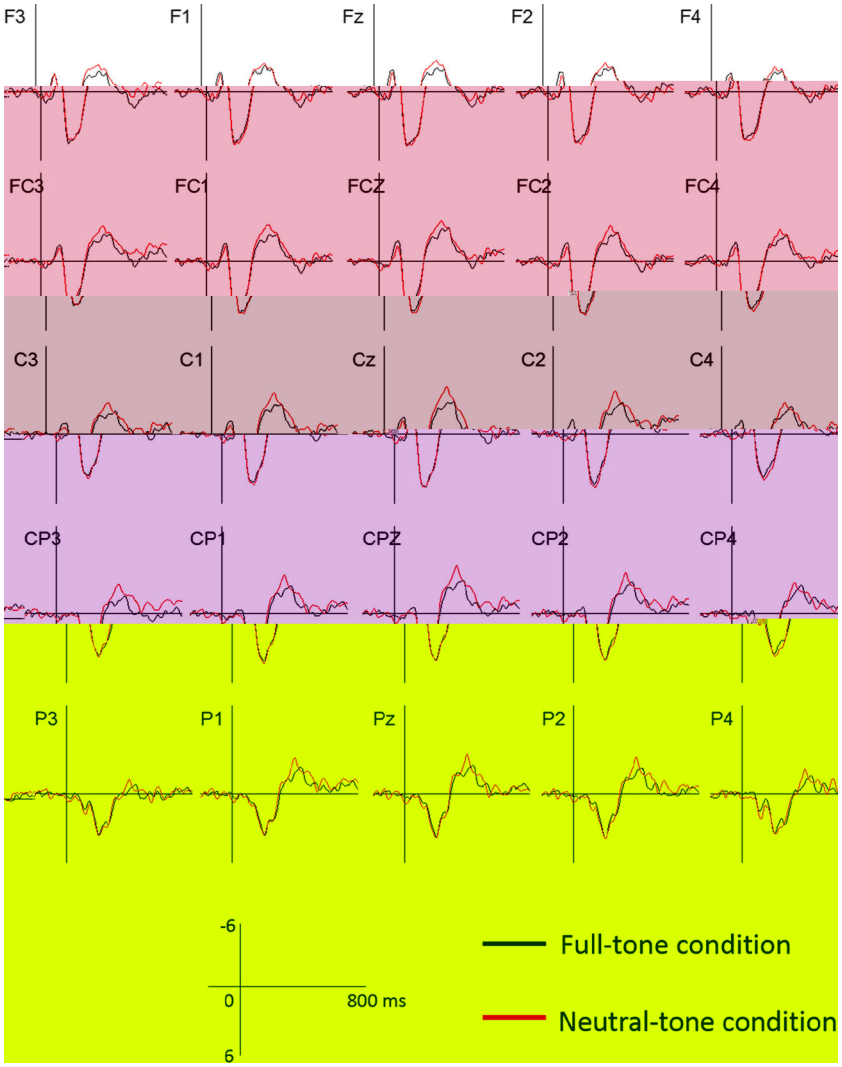


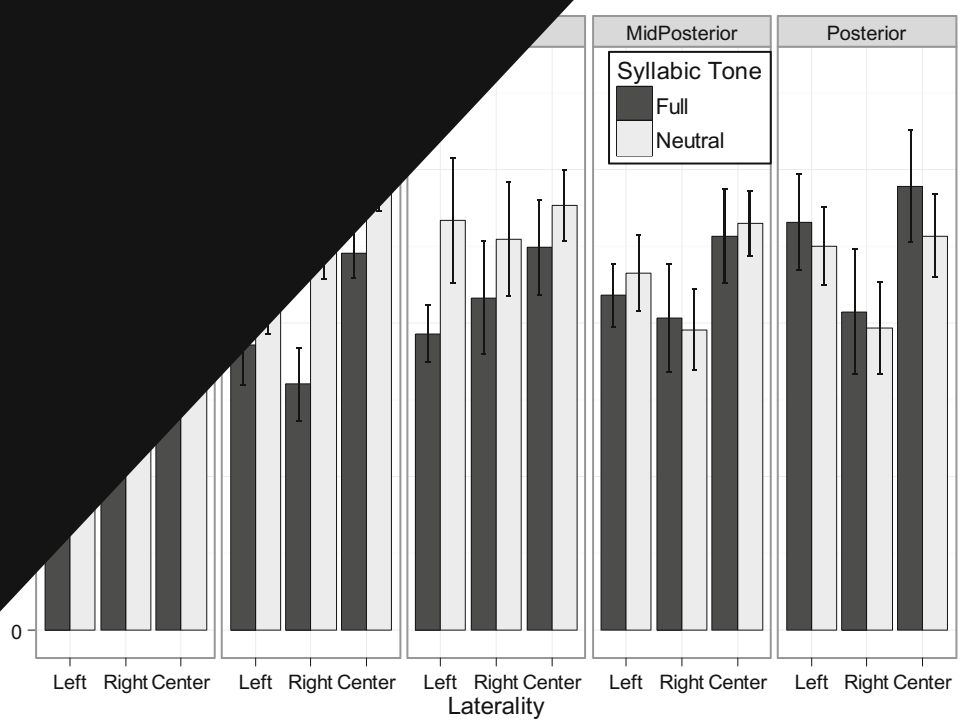
Fig. 4 -

N400 400 , , - - , b –0. 0μ , SE 0.13, t 4. 2. , , b –0. μ , SE 0.14, t –4. 4. . 250 - , b 0.34μ , SE 0.04, t .12. 250 - , b –0. 2μ , SE 0.13, t 5. 3, – , b – 0. 1μ , SE 0.13, t .0 .

P600 00 - , - , b –0.32μ , SE 0.14, t –2.1 . , , - , b –0.14μ , SE 0.05, t –2. 0. . 400 , b 0. 0μ , SE 0.03, t 2 .0 . - , b 0.14μ , SE 0.10, t 1.3 .

Discussion

- 100 - - - , 250 . 400 , - - . - - , - - . 100 .


MidPosterior
Posterior
Syllabic Tone
Full
Neutral
0
Left
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Center
Laterality

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(200 , 2011) 400

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Experiment 2

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Method

Participants 50

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Material

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Procedure ,

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4 *most difficult.* ,

(1.3 . 1.3), *F* < 1.

Measurement and data analysis

(& , 1 , 1), (. ., , , & , 2005 , , & , 200). (& , 2005). , (., 2014). (., 200). 1. % , . 10 % , (. ., .). ( ), 5 00 .

Table 3 2 - , , ( ) , - ( )

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-	2 (.2)	2 (.1)	2 4 (5.3)	2 (.3)	2 (5.)	2 (.5)
	313 (.)	321 (10.2)	325 (.3)	33 (11.3)	33 (.)	33 (.)
	3 1 (13.3)	3 3 (14.2)	3 3 (10.5)	3 4 (13.)	40 (13.)	400 (12.)
-	2 2 (5.3)	2 (.2)	2 2 (5.0)	2 5 (.2)	2 (.)	2 (5.)
	320 (.5)	312 (.)	301 (.2)	32 (.1)	314 (.0)	312 (.5)
	3 1 (10.)	3 (10.3)	35 (12.3)	3 (12.3)	3 (12.0)	3 4 (13.4)

- . (2014) (–4), *b* –0.01 , *SE* 0.013, *t* 1.41, (2005), (–1) (–31), *b* –0.04 , *SE* 0.020, *t* 2.24, *b* –0.0 2 , *SE* 0.025, *t* 2. , . , , , - - (.3 % . %,), *b* –.352 , *SE* .1 1, *z* (3 5 ,), 2.0 . - - - (*t* < 1.5). - (1.20 1.24,). (11), *b* , , *b* –.00 , *SE* .005, *t* 1. 5, *p* < .1. .1 , *SE* .103, *z* 1. 3, *p* < .1. , *t* < 1.5.

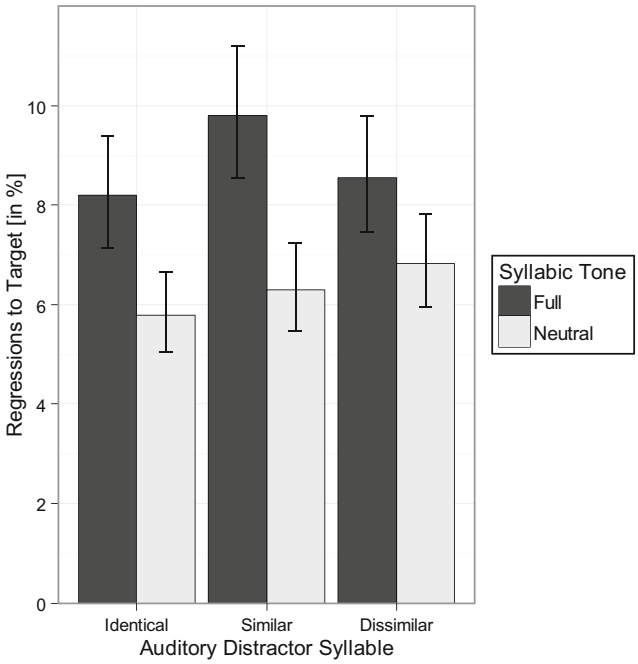

Fig. 8 *SE* 5 %

Posttarget word region , - , *t* < 1.4. , — — - . - - ( ), (14), (10) *b* .00 , *SE* .004, *t* 2.21 *b* .013, *SE* .005, *t* 2. *b* .011 , *SE* .005, *t* 2.21, . — , - — (2, , 13 ,) , *t* < 1.5, , , , *t* < 1.5. , , .

Discussion

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General discussion

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Appendix

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Morphological Structure		
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	22	1
	4	2
	3	3
	1	3
	1	1
	1	1
Morphemic Status		
(2)	2	2
	2	2
	41	41
	1	1

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