

Research Report

ERP correlates of the development of orthographical and phonological processing during Chinese sentence reading

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Article history:

Received 12 October 2014
Received in revised form 12 October 2014
Accepted 12 October 2014

Abstract
ERP correlates of the development of orthographical and phonological processing during Chinese sentence reading were investigated in a group of 12 children (aged 6–10 years) and 12 adults. The results showed that the ERP correlates of orthographical processing (N1 and N2) were present in the children and adults, and the ERP correlates of phonological processing (N3) were present in the children and adults. The ERP correlates of orthographical processing (N1 and N2) were present in the children and adults, and the ERP correlates of phonological processing (N3) were present in the children and adults. The ERP correlates of orthographical processing (N1 and N2) were present in the children and adults, and the ERP correlates of phonological processing (N3) were present in the children and adults.

.....

far-near

.....

因 because of 阴 negative

诚 honest 城 city

成 suc-

cess

服 clothes 报 newspaper

Hanja

Hangul

.....

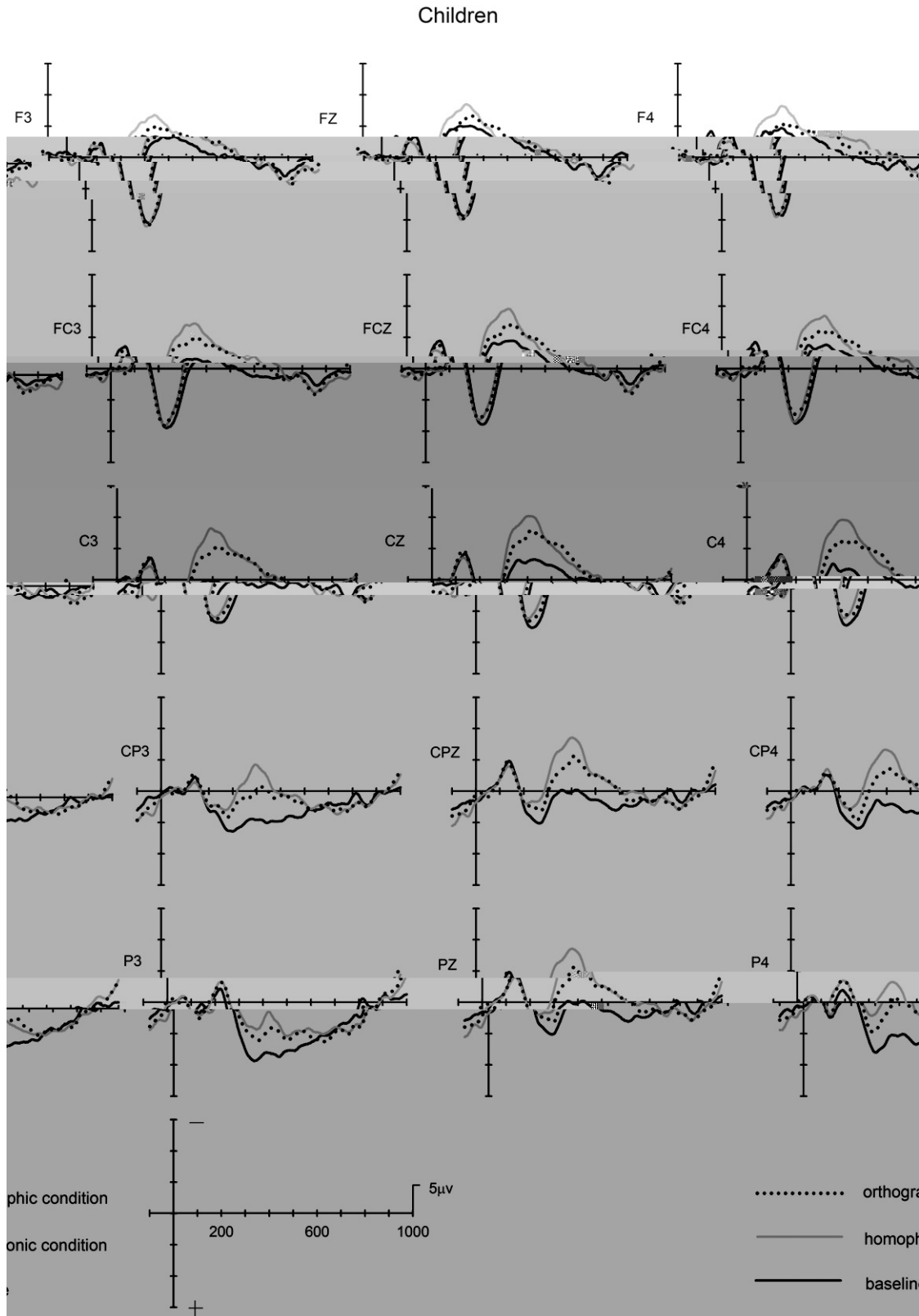


Fig. 2 – Grand average ERPs for the child participants at 15 typical electrodes. The solid line was for the baseline condition, the dotted line for the orthographic condition, and the gray line for the homophonic condition.

F(1, 14) = 10.2, $p < .01$, $\eta^2 = .42$, $d = .84$, $\mu = 1.2$ (baseline), $\mu = 1.8$ (orthographic), $\mu = 1.4$ (homophonic), $F(1, 14) = 10.2$, $p < .01$, $\eta^2 = .42$, $d = .84$, $\mu = 1.2$ (baseline), $\mu = 1.8$ (orthographic), $\mu = 1.4$ (homophonic).

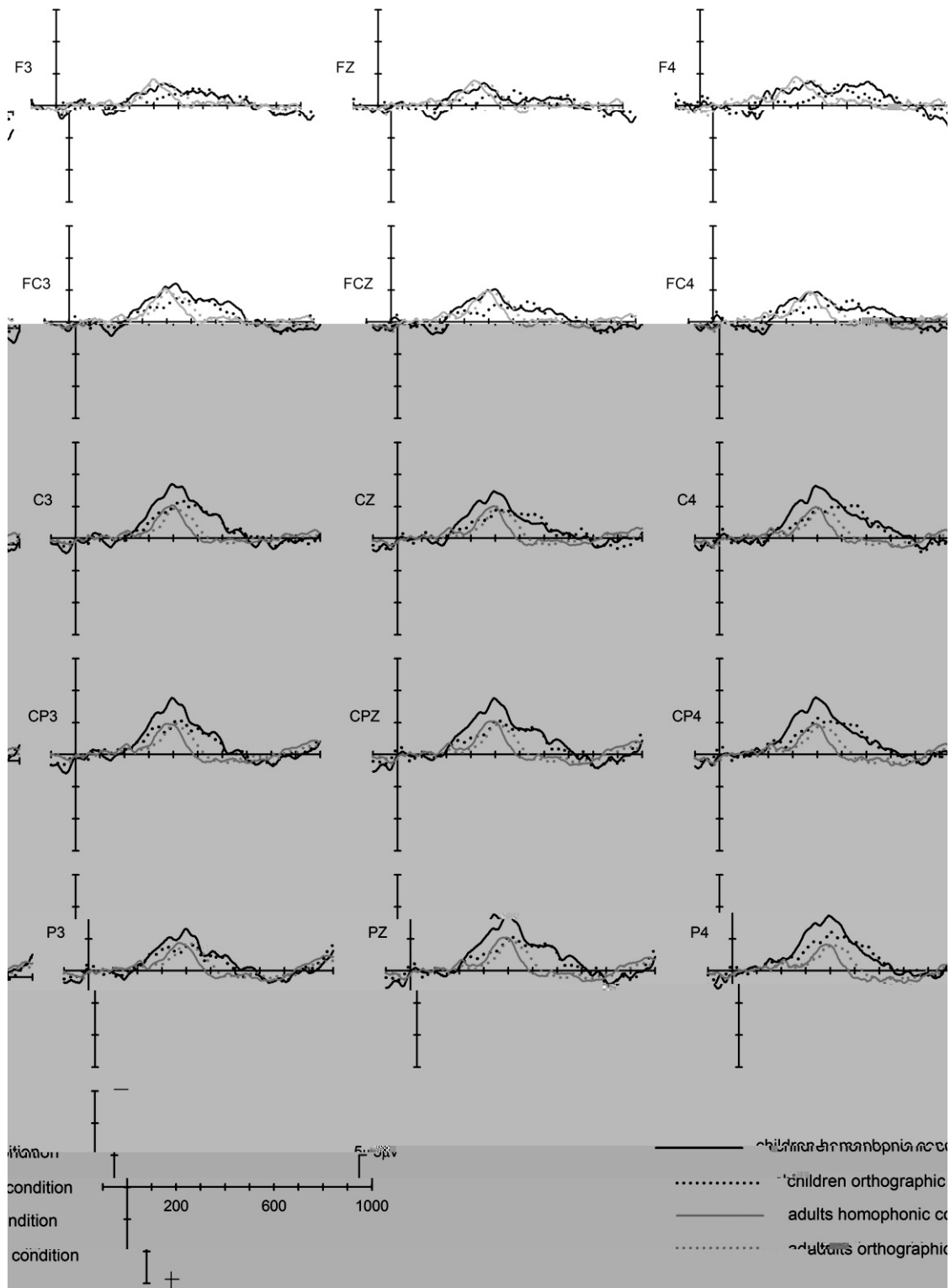


Fig. 3 – Difference waveforms contrasting the homophonic and the baseline conditions and contrasting the orthographic and the baseline conditions for the adult and the child participants.

... p <math>< p</math> ... F ... p ... μ ... p ... μ ... p ... p ... μ ... F ... p ...

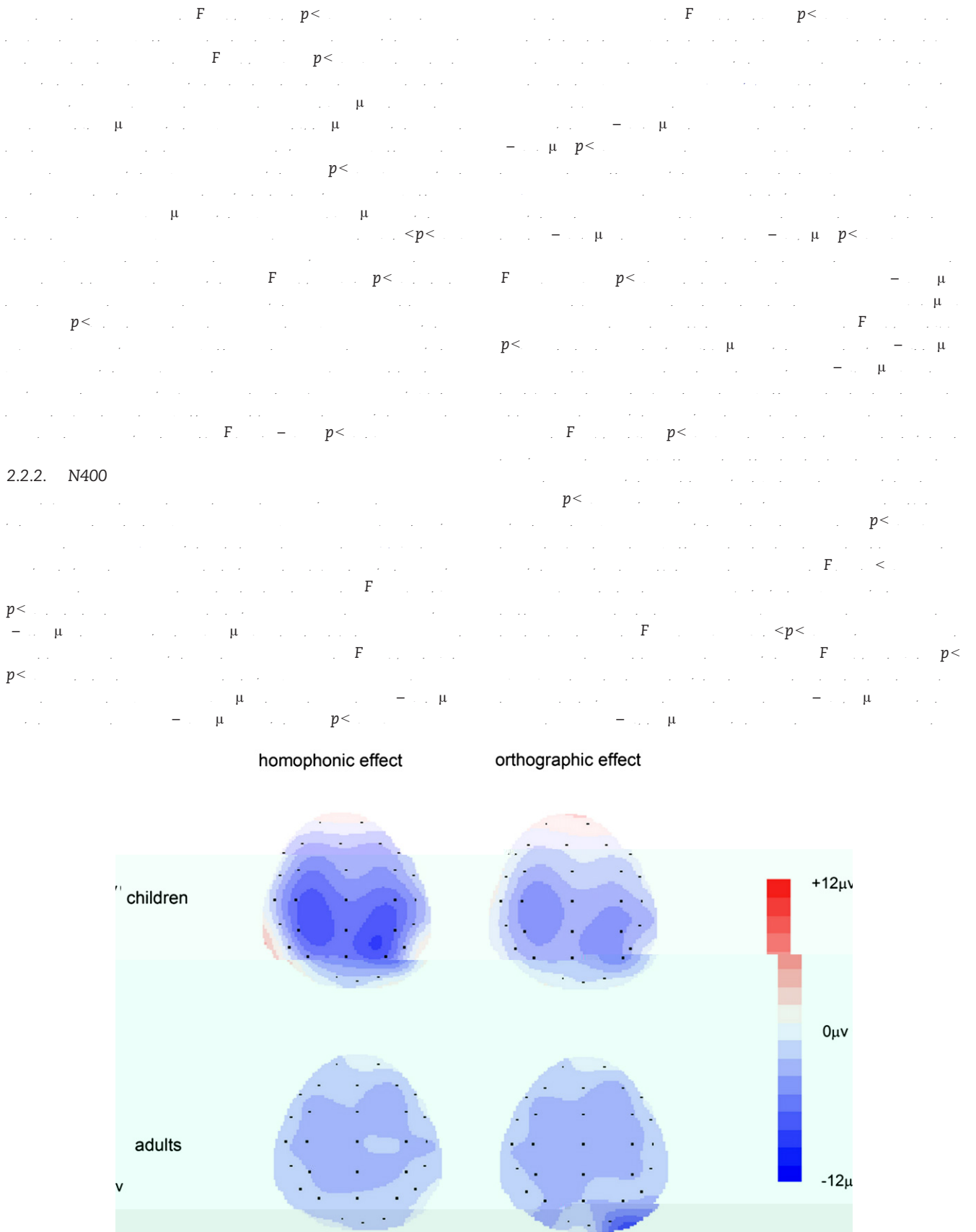


Fig. 4 – Topographic maps for the averaged N400 effects in the 300–500 ms time window for the child and adult participants, contrasting the homophonic or the orthographic condition with the baseline.

$p < \mu < p <$

$p < F$

$p < - \mu - \mu$
 $p <$

$- \mu$ $p <$
 $- \mu$

F $p <$
 $- \mu$

F $p <$

$p <$

$p <$
 $- \mu \mu - \mu$

F $p <$

F $p <$

F $p <$

$p <$ $p <$
 $p >$

$p <$
 F $p <$

$< p <$

F

F $p >$ $F <$

$p <$
 $- \mu$

$p <$

$p <$

$p <$
 F

$p <$
 $- \mu \mu - \mu$

F $p <$

F $p <$

F $p <$

$p <$ $p <$
 $p >$

$p <$
 F $p <$



Table 3 – The mean frequencies (per million) and the numbers of strokes for the critical characters and the characters in the original base words

Character	Mean frequency (per million)	Number of strokes
尘	0.0001	6
晨	0.0001	12
服	0.0001	12
报	0.0001	7
龟	0.0001	14
电	0.0001	5

尘 dust 晨 morning

4. Experimental procedures

4.1. Participants

4.2. Stimuli

4.2.1. Stimuli and design

服 clothes 报 newspaper

龟 tortoise 电 power

4.2.2. Pretests of stimuli

“ ” “ ” “ ” “ ”

... ..

4.3. Procedure

... ..

... (text is extremely faint and illegible) ...

... (text is extremely faint and illegible) ...