

ORIGINAL ARTICLE

Dissociated Neural Representations of Pain Expressions of Different Races

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Abstract

T. C. C. (RS) I. W. P2/N2 C. O. fi

Key words: EEG,

Introduction

A. .2012). E. (ERP) 100 (N1) 170 (N170, S. I. 2013). 200 (P200) (I. U. 2003; K. 2009). I. B. 2009; K. 2009; M. 2012; M. 2013). F. (MRI) (W. 2001), A. I. 2007; I. B. 2009). (R. 2003) fi

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?A MRI
 (L . 2008) (C . 2008)
 ERP
 / /
 fi (K . I 2007).
 O MRI
 ERP
 MRI
 ()
 (X .
 2009; A . 2013; S . 2014). ERP
 ()
 / 128-188 (P2) 200-300 (N2)
 (S . H 2012; S . 2013;
 H . H 2014). F
 (S . 2014) (A .
 . 2010).
 T fi
 (J . 2002;
 D . 2011). H
 fi . B (B . Y 1986) (H .
 . 2002)
 . T
 (. .) ()
 H . (2002)
 ()
). S
 fi
 (I . B 2009; K . . 2012)
 . T
 2 . T fi 2
 . T
 fi

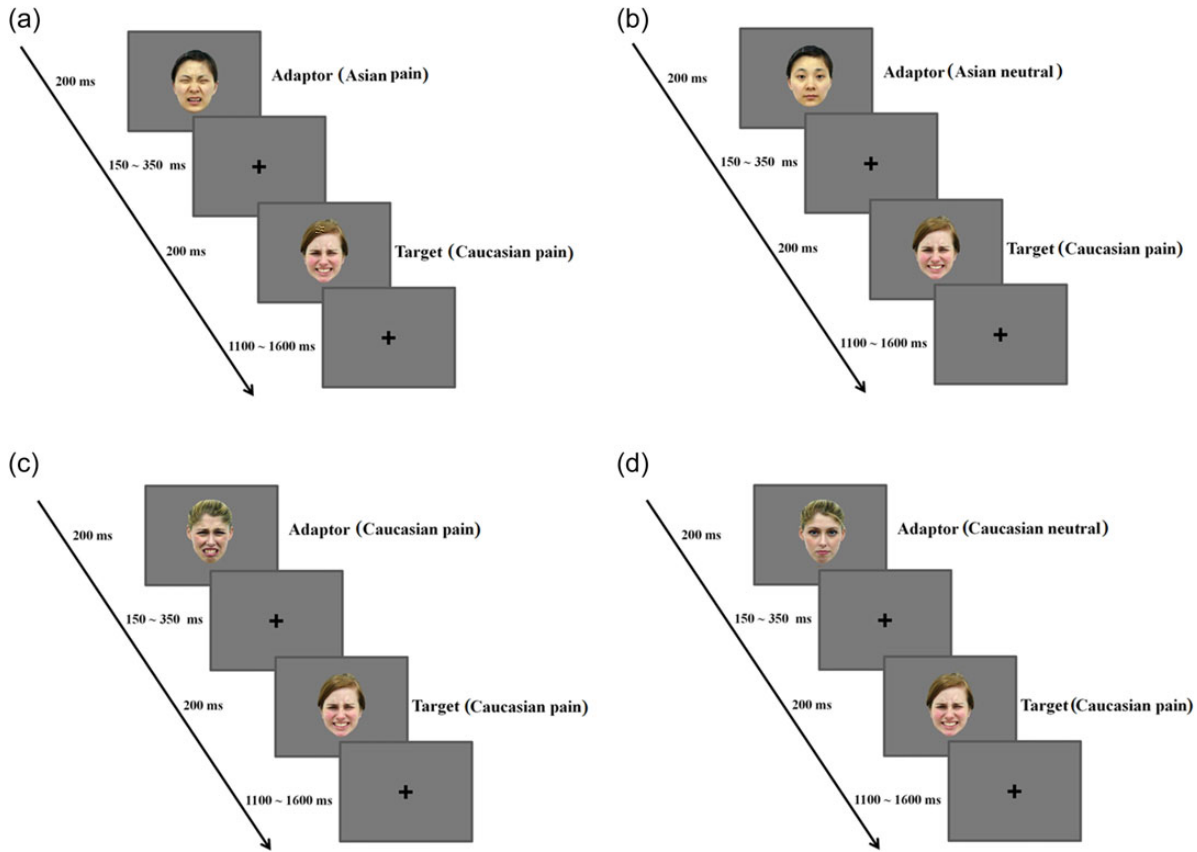


Figure 1.I

EEG . T fi
 . A . T A C
 . O
 -
 T RS
 . C
 RS
 . W ERP C C
 .
Materials and Methods
Participants
 S C (8 , 19 27 , M = 21.56
 , SD = 2.50) 16 C (8 , 17 27
 , M = 21.06 , SD = 2.62) B , C
 . A C
 C . C 7 G , 4 A
 , 2I , 2F 1S
 C 1 1 (= 6)
 . P
 E I M (P 1992),
 (C : 2.73 0.45; C : 2.85 0.46,

C
 . O A H
 .
 t₃₀ = 0.72, P = 0.479). A
 fi E H I (O fi 1971),
 T
Stimuli and Procedure
 S (S H)
 2012) 32 16 A (8)
 32 16 C (8) . T 2
 . R /
 C A (S
 H 2012).
 E 200
 fi A
 150 350
 fi
 1100 1600 (F . 1). E
 3.8 4.7
 120 . A
 . A

1 2 . T 8. 128 . A

()

(P)

T

9- L (1=

, 9=

(EEG) . P)

(IRI, D 1983) 5- (0=

, 4=

I A T (IAT, G . 1998)

. A 10 A 10 C (

) 20 IAT. I C4)

20 / A 40

. I C 20 / A 40

. T IAT C / A

(G . 2003),

2

. A D 0

. D 0

. A

9- L (1= 9=

) A

EEG Recording and Analysis

A N S EEG

T EEG 62

E

. T 1.5

(0.1–100 Hz) . T EEG 250 Hz.

T ERP 1000 . T 200

50 μV

91 14

91 15

. T 200-

ERP

W fi RS

ERP

ERP

b, ERP

1a

1c

) 2

RS

2

S

F 1

C

RS

fi . A

ERP

ERP

F 1a b

1c d. H

RS

ERP

F 1c d. “ ”

ERP

F 1a b.

N1, P2, N2

(F, F3, F4) (C, C3,

C4)

. M P3 N170

(P7 P8) (C, C3, C4, P, P3, P4)

. R

(ANOVA)

ERP

(RT), A R (

), A E (), T R

(C C)

ANOVA ERP

(. , C3 C4)

. H (

H

fi

R

ERP

(F < 1). O (

Results

Behavioral Performances

T 1

. ANOVA RT

(

ANOVA) fi (P > 0.1). P

(6.39 1.15 .178 0.94, F_{1,30} = 422.92,

P < 0.001) (4.44 1.96

.177 0.97, F_{1,30} = 79.23, P < 0.001). R

A C

(P > 0.1). O - t- IAT D

D fi 0 C

(0.51 0.28, t₁₅ = 7.29, P < 0.001).

C (0.18 0.41, t₁₅ = 1.79, P = 0.094). I

t- fi D C

C (t₃₀ = 2.65, P < 0.05).

T , C

C . I t-

IRI C C

(T 2, P > 0.2).

ERPs to Adaptor Faces

ERP

84-124 (N1) fl 128-188 (P2)
200-300 (N2)
420-

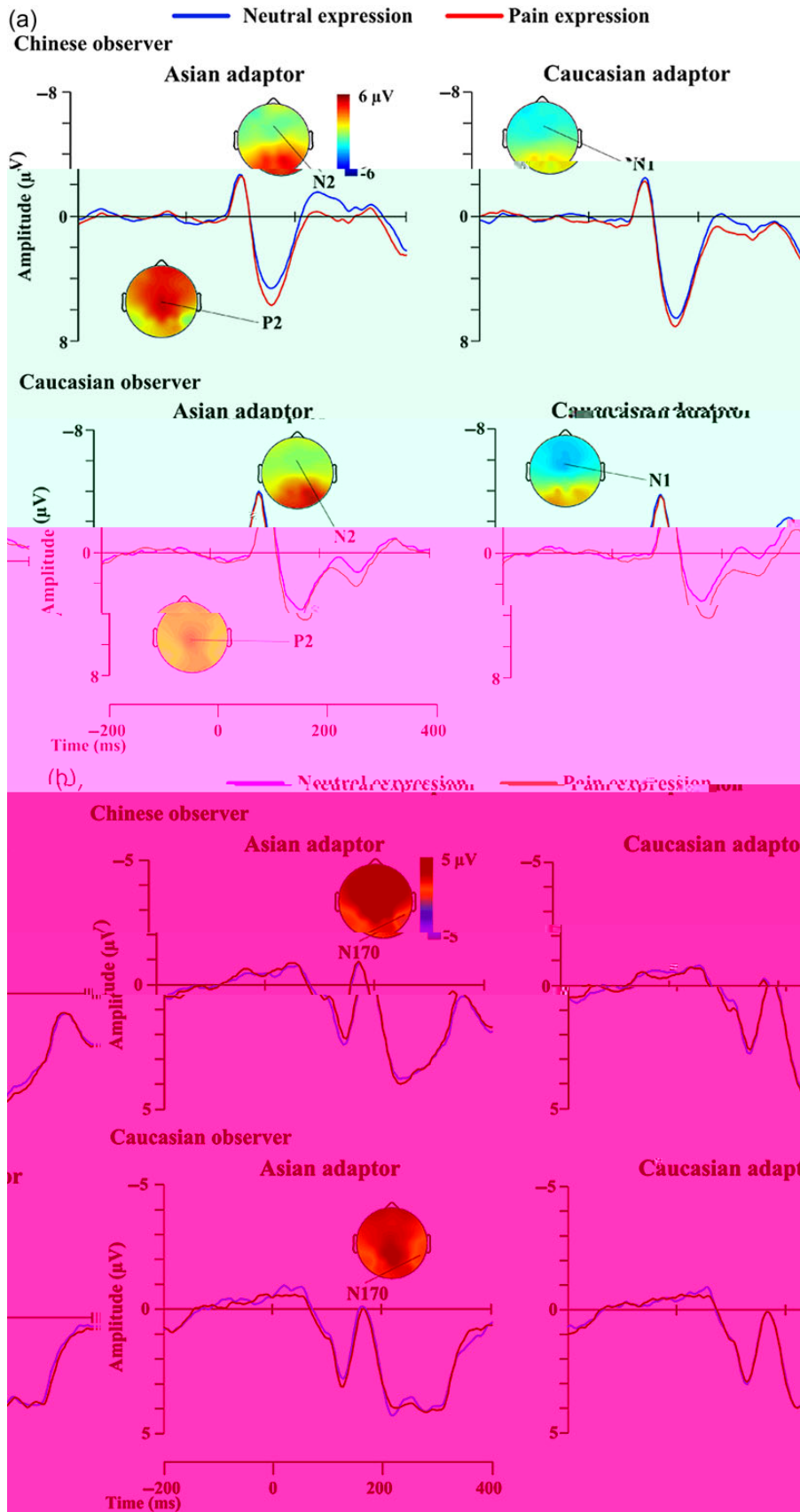


Figure 2. (a) ERP (P2/N2) for Chinese and Caucasian observers. (b) ERP (N170) for Chinese and Caucasian observers. (C) M. (P8). T

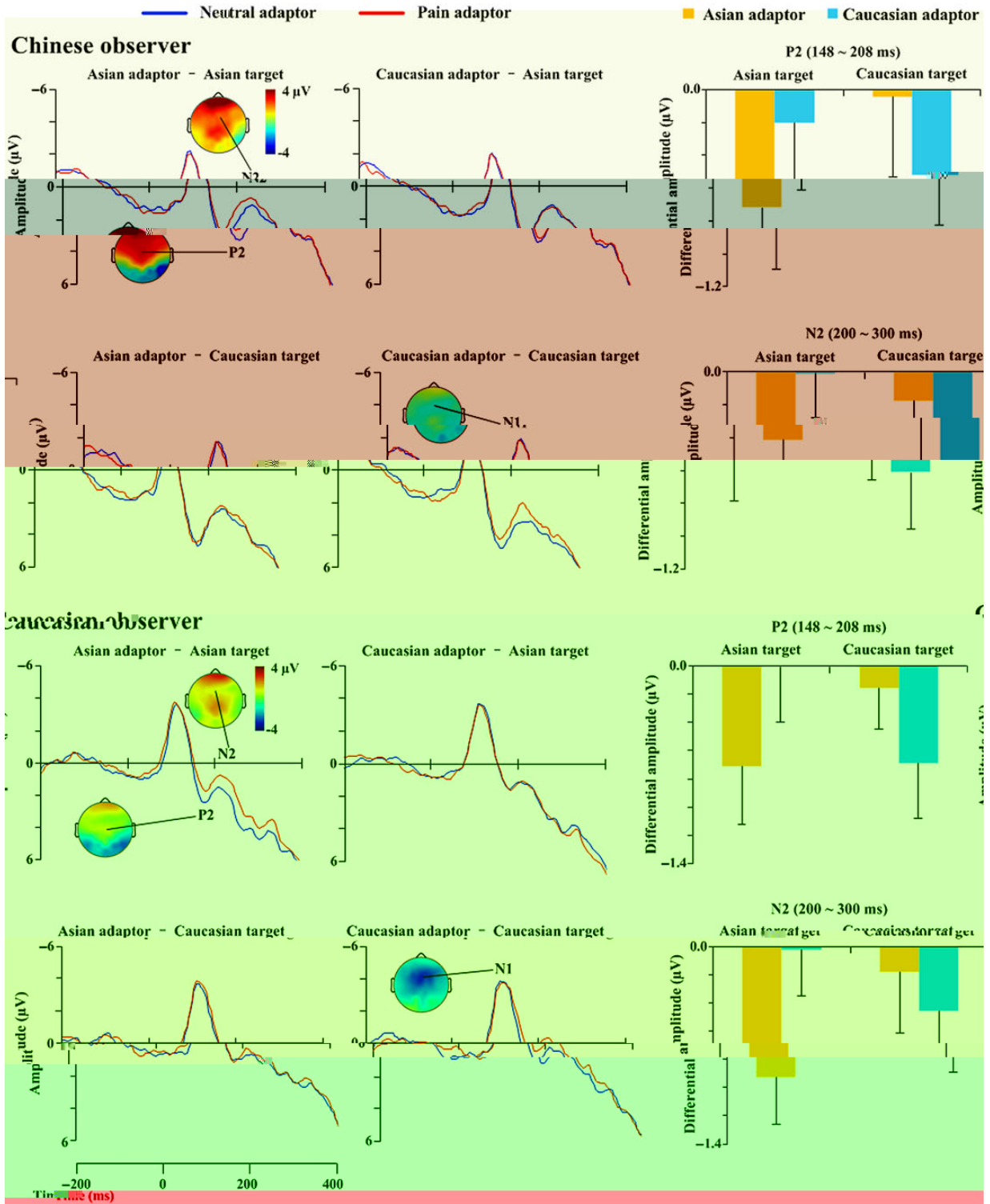
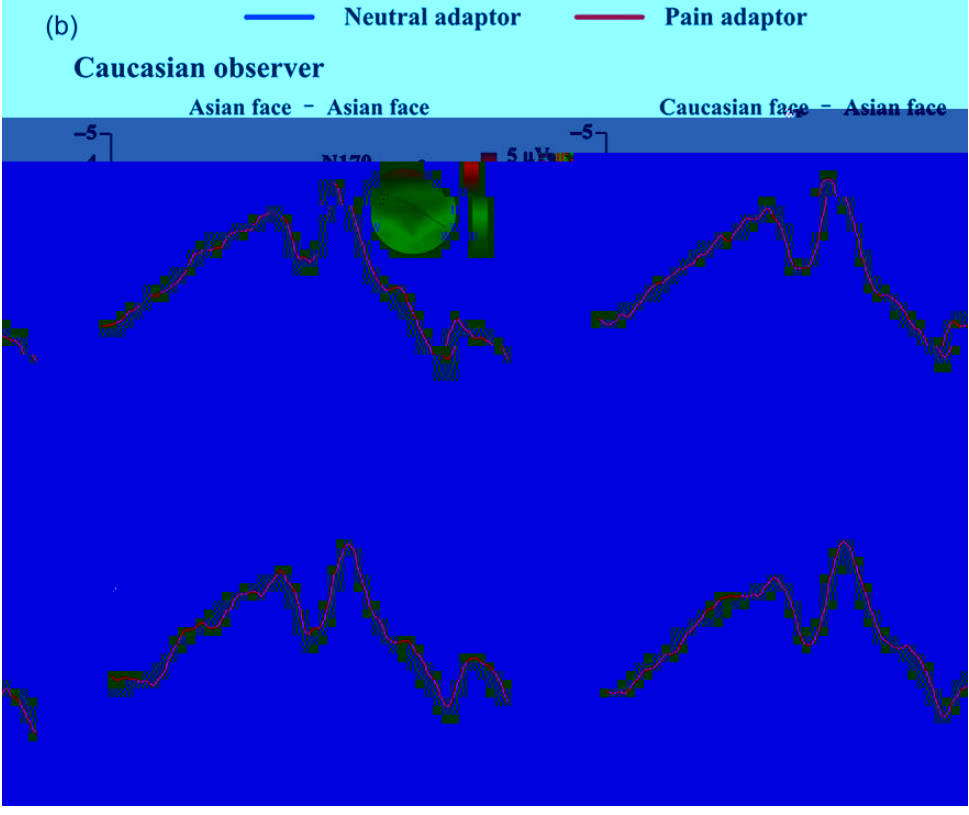
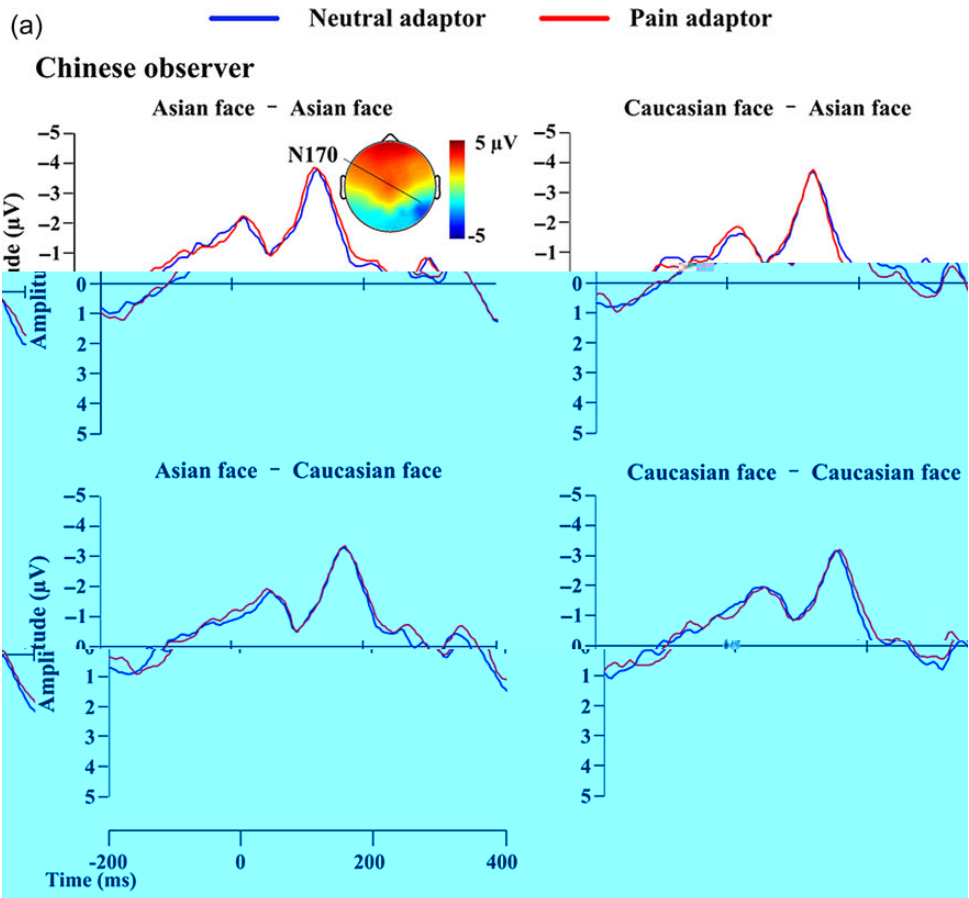


Figure 3. M... ERP... ANOVA... N2... (F_{1,30} > 29.31, P < 0.001),... (F_{1,30} > 4.99, P < 0.05),... RS... N2... T... RS



	fi	fi	A
E	A	R	T R (F _{1,30} > 4.43, P < 0.05).
S	RS	N2	
	fi		(F _{1,30} = 2.53-3.49, P = 0.071-0.122).
	RS	N2	(F _{1,30} < 1, P > 0.6).
	fi		(F _{1,30} > 4.65, P < 0.05).
T		P2 N2	(F _{1,30} < 1, P > 0.4, F = 2).
	RS		
S	S	T	4
O		P3	
		(F _{1,30} > 15.14, P < 0.001).	ANOVA N170
	fi	T	R (F _{1,30} = 10.50, P < 0.005),
		(F = 4).	N170
	N170	P3	(P > 0.05).
ANOVA	P2/N2/P3/N170	E	
	fi		(P > 0.05),
	RS	ERP	C
C		W	
		P2/N2 RS	

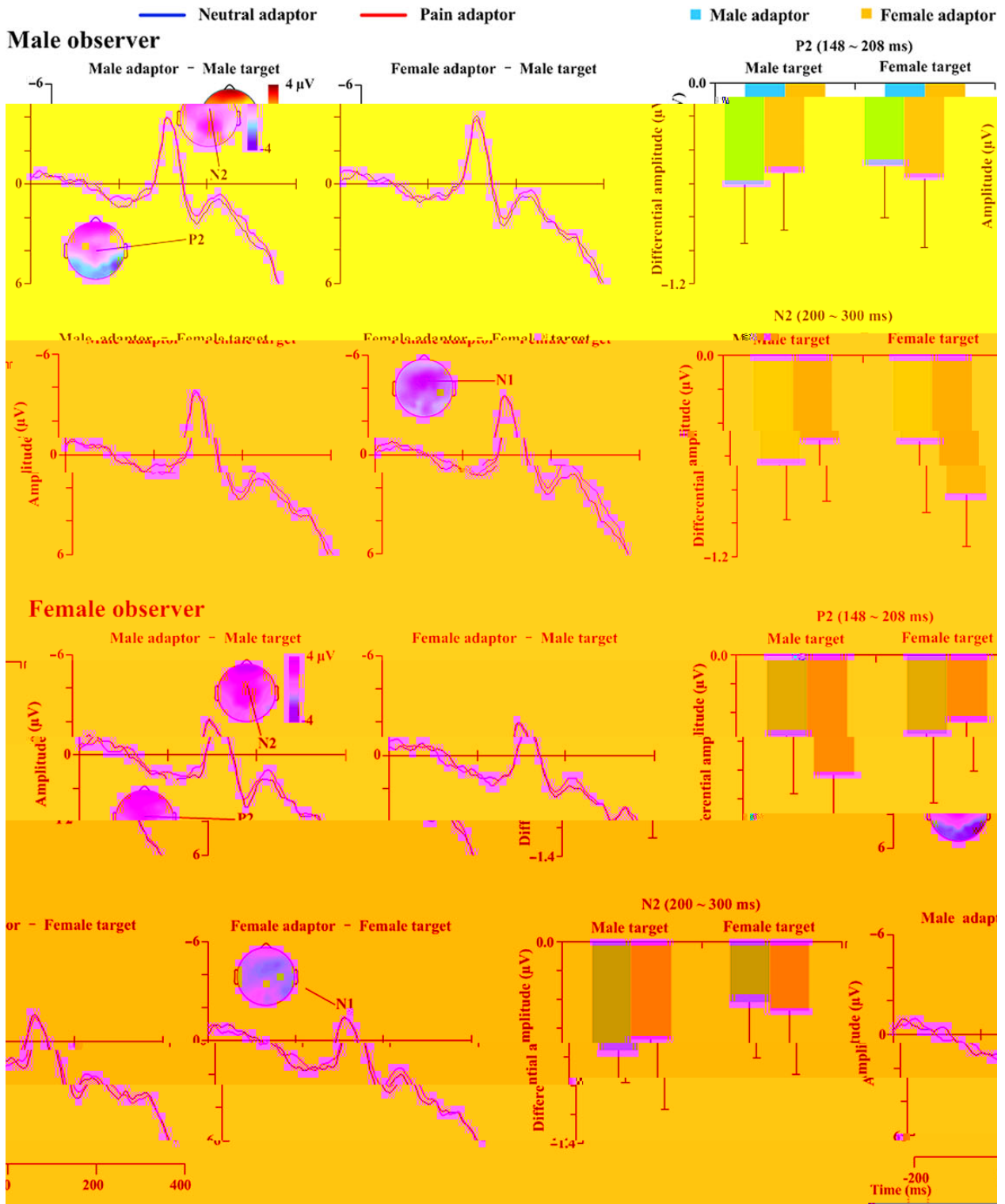


Figure 5. P2/N2

() ERP

P2/N2

S P2 (2012). T MRI fi

(S H (S . 2007;

S (2014)
 (X 2009; A 2013; S 2014). S P2
 P2 / H P2
 S F MRI P2
 P I (V (R N170 .2013). T
 E 1992; V .2010) (S
 H 2012). R P2
 T fi (S .2013).
 T fi
 M ERP / N1, P2,
 N2, P3
 B W (I B 2009; K
 2012). M P2/N2
 (I B 2009). S (S
 H 2012) P2
 H P2 N2 RS C / S 2008). MRI (V .2008; M
 2003; D B 2007) fi (., I U
 P300 (I U 2005; W -J
 I 2006) fi (I B
 2009). T N170 (V
 2010). O fi RS
 P2/N2
 H ? F
 B C
 3 (K .2005). B 6
 (K .2007). A K 3 9
 E C C 3 9 A
 (S .2005). T fi

.D
 A
 T
 fi
 N170
 (R .2013). T
 F
 A fi (O W 2003) fi
 (R 2000),
 fi
 fi T
 fi
 O fi RS 2
 A
 (V .2008; M
 S 2008). MRI F 2 E
 (2011) fi RS FBA
 (EBA) (FBA)
 M
 EBA FBA T fi
 2 H
 2
 2
 (A , 2)
 H ()
 2 O 2
 2
 I
 2

Supplementary Material

S [http://www.oxfordjournals.org/](#) : //

Funding

T C (P 31470986, 31421003, 91332125 81161120539) M E C (P 20130001110049).

Notes

Conflict of Interest: N

References

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 H B M
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 . N I
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 I TA, B BD. 2009. T . T
 C S . 13:524-531.
 I TA, U GR. 2003. R
 . J P S P . 85:616-626.
 I TA, U GR. 2005. T fl
 : ERP
 . C A B N . 5:21-36.
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 R B, L P, S BH, K R, B D. 2013. S
 . P N A S USA. 110:
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 R MH. 2000. C
 fl . E R S
 23:1002-1034.
 R P, M R, H U, G M, H T. 2001. F
 : D
 . N . 32:747-757.
 S MV, H Y, W AC, S M, K E,
 H R. 2007. T
 . C C . 17:230-237.
 S S, P C, A AM, V VAG, D
 S S. 2005. R
 . P S . 16:440-444.
 S W. 1995. P
 . S C
 8:31-46.
 S HT, S J, C M, J M, W AI,
 H AO. 2006. S
 . N . 17:365-369.
 S KB, I TA. 2013. S
 N170' . S C A N
 8:937-942.
 S P, M F, C L, D 'A R. 2014. T
 . S C
 A N . 9:454-463.
 S F, H S. 2012. M
 . N I . 61:786-797.
 S F, L Q, L H, F F, H S. 2014. T
 . N I . 88:263-270.
 S F, L Y, B, W, H S. 2013. O
 . B P . 92:380-386.
 S A, G JOS, H A, S BP, J L, F BA,
 P DC. 2011. S ? L
 . S
 C A N . 6:434-441.
 V T, E M. 1992. T
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 . P
 N A S USA. 107:20081-20086.
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 P S . 16:56-63.
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 . B B S . 25:475-480.
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