Neural Substrates Differentiating Global/Local Processing of Bilateral Visual Inputs

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Key words: ; / ; ; /

INTRODUCTION

, 1977 , 1986 ., 1989, 1990; ., 1988 . D ., (E), . 1997, 1999 , 2000 100 (1), C , 1996; ., 1994 . 200 300 (2), ., 1997, 2000; – , 1993; ., 1998 . 3

C : F C ; C : 30225026; C : C ; C : 2002CCA01000.

*C : . D., D , 5 , B 100871, C . E- : @ . .

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D : 10.1002/ .20044
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240 320 (2)
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SUBJECTS AND METHODS

Participants

(2 , 8 -
; 21.2 ; 20 24)
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D ,
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Stimuli and Procedure

CD ,
7 × 7 , F 1.
(A, E,)
(. ., / : A/E,
A/ , E/A, E/ , /A, /E). A
F F,
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F F -

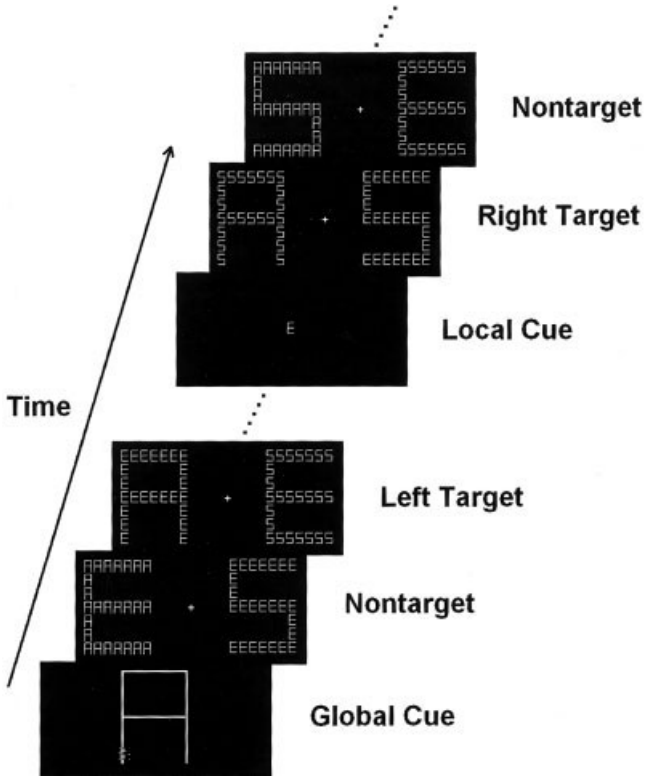

Figure 1.
Illustrations of the stimuli and procedure used in the current study.

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fMRI Image Acquisition and Analysis

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RESULTS

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(96.1 . 62.2%, = 8.99, $P < 0.001$)

TABLE I. Brain areas activated by global/local processing of bilateral visual inputs*

C /	BA	x	y	z	
G					
	21	−44	−2	−18	4.71
	41	−40	−18	2	3.94
	41	−52	−16	12	3.87
	36	32	−24	−14	3.99
	36	24	−40	−8	3.34
	36	28	−36	−18	3.29
	7	−14	−74	32	3.83
	7	−30	−62	48	3.55
	7	8	−72	50	4.03
	7	22	−78	38	3.96
	7	24	−64	58	4.04

* A $P < 0.01$. BA, B .

(762 . 867 , = 3.02, $P < 0.014$). F (1.9 . 3.0%, = 1.34, $P > 0.2$).

B

B 21 41 (F . 2). A . F

B 36 (F . 2).

B 7 (F . 3).

F ., 1996; ., 2002 ; ., 2001

DISCUSSION

E ., 2000; ., 1999 ; ; ., 1998 . ., 2002

. B

E

., 2002

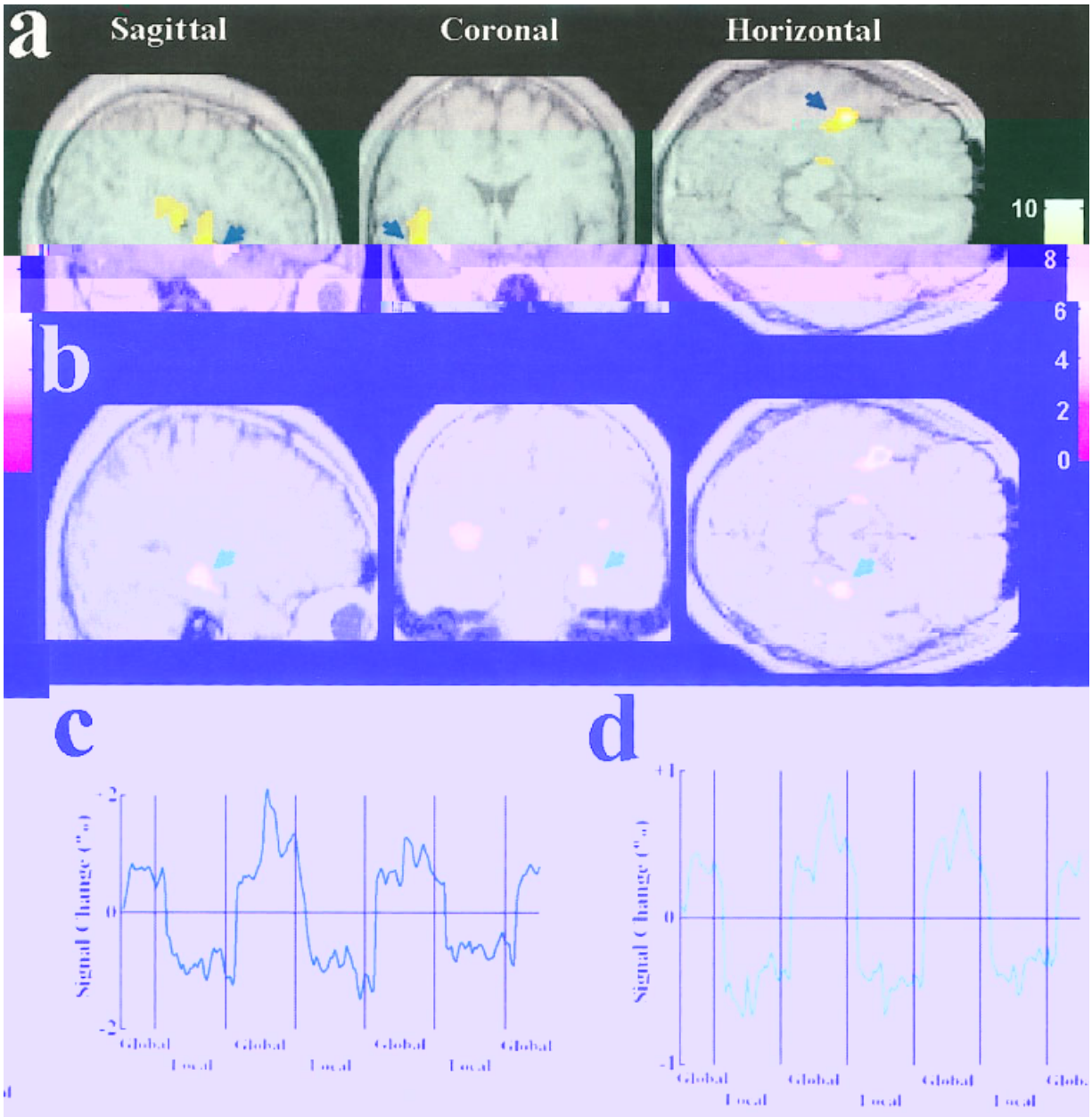
a
Sagittal
Coronal
Horizontal
10
8
6
4
2
0
b
c
d
Signal Change (%)
Global
Local

Figure 2.

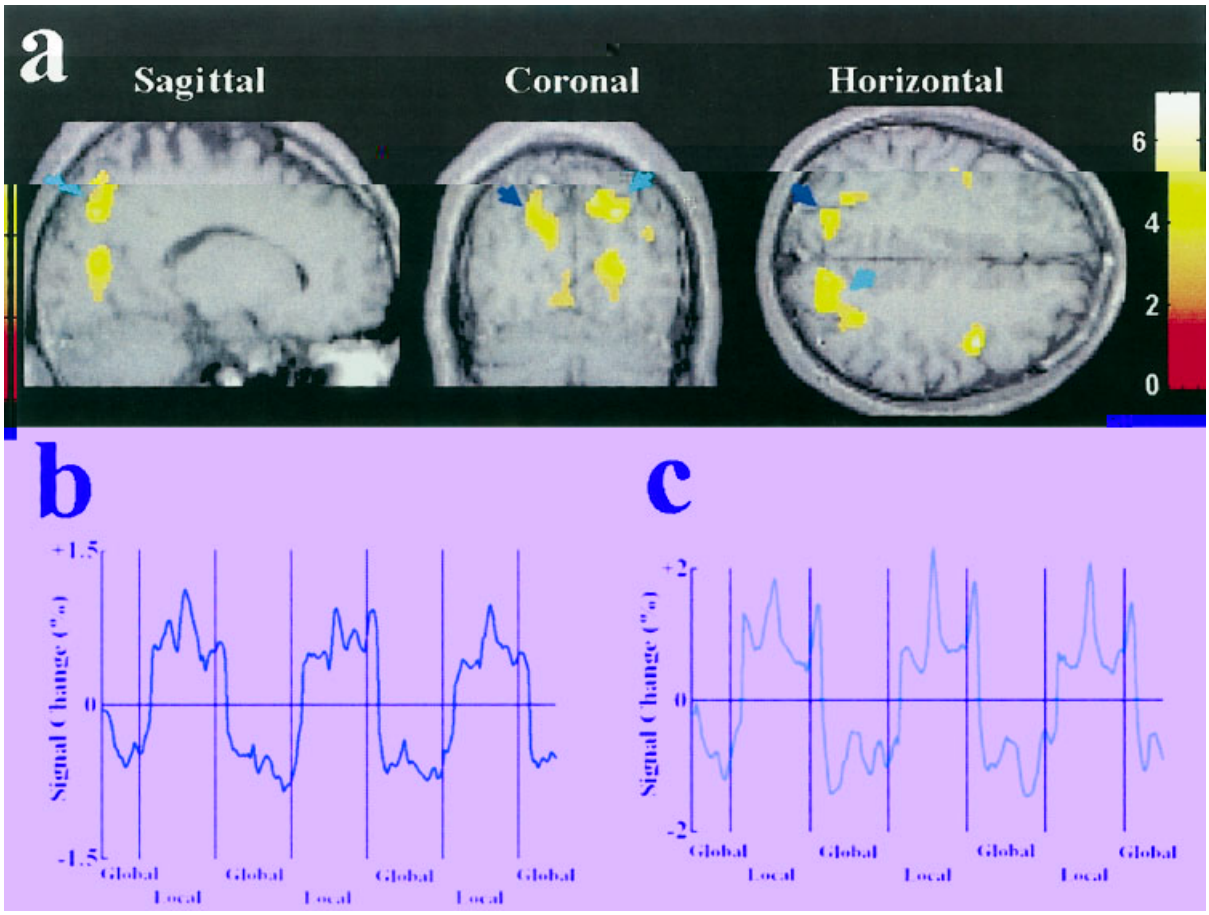

Figure 3.

Brain areas activated by attention to the local level of bilateral compound stimuli. The results of the group analysis from 10 subjects were plotted on MR images of a representative subject. Threshold for activation of all clusters was $P < 0.01$ (corrected). The activations were observed in bilateral superior cortex. The color bar indicates the scale of z values. **a:** Activations in the left superior parietal cortex (indicated by blue arrows) and the right superior parietal cortex (indicated by green arrows). **b:** The time courses of the signal change in the left superior parietal cortex as a function of global/local attention, averaged across the 10 subjects. The mean image values obtained from the average of the six scans were used as baseline. **c:** The time courses of the signal change in the right superior parietal cortex as a function of global/local attention, averaged across the 10 subjects. The time courses were averaged from raw fMRI signals.

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291.GB

B, C (1999): . C , A: .
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A, A , A CF, A (2003): : . 23:333 346.
, C, (1990): C - : . E C 16:471 483.
, C, (1989): A - : - . 27:471 483.
A, , F , B , E, (1997): : E - . 8:1685 1689.
A, D F, A - , A (2001): E - - . C 112:1980 1998
D (1977): F : - . C 9:353 383.
A , A, A (1998): E - - . - . C B 6:321 334.
C, , (1988): E - - . 8:757 3769.
C, E , . (1993): . E 19:471 487.
, F B, A , , D A , B (2001): - . A A 98:2077 2082.
(1982): : ? E 8:253 272.
G , (1987): - . 16:89 101.
G , A, G , (1986): . 15:259 279.
, (1998): C - . : .
(2003): C : . C C 13:90 99.