The role of parietal cortex in global/local processing of hierarchical stimuli: a transcranial magnetic stimulation study

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We studied whether the posterior parietal cortex contributes both to focus attention on one level and to switch attention between global and local levels of compound letters across trials. After 1 Hz repeated transcranial magnetic stimulation was applied to the left, right posterior parietal cortex, and the precentral gyrus, participants identified global and local target letters. We found that repeated transcranial magnetic stimulation over the left posterior parietal cortex resulted in faster global than local responses but did not affect global-to-local interference and the level-repetition effect. The results suggest that the neural mechanism underlying focusing attention on one level of compound stimuli is distinct from that mediating switching attention between global and local levels across trials. *NeuroReport* 18:1921–1924 © 2007 Wolters Kluwer Health | Lippincott Williams & Wilkins.

Keywords: compound stimulus, global/local, parietal cortex, transcranial magnetic stimulation

Introduction

. I
1 4 . F , ,
5 7 . A
( )
(. .) 8,9 .
A -
. A
4,10,11 , MRI
12 . I , M *et al.*
13
(TMS) - -
- A -
. T
TMS
. B
(F . 1), 1-H TMS
TMS 15 . I , TMS
. I
, TMS
/
- . O ,

Materials and methods

Participants

E , - (11 , , 19 23 , =20.7) , . A . A - - . . T , D , P , P .

Stimuli and procedures

T (74.5 / 2) (15.7 / 2) , - , 125 . E (2.8 × 1.8°) (0.36 × 0.23°) 5 × 5 (F . 1). T H′ S′ A′ E′ . E

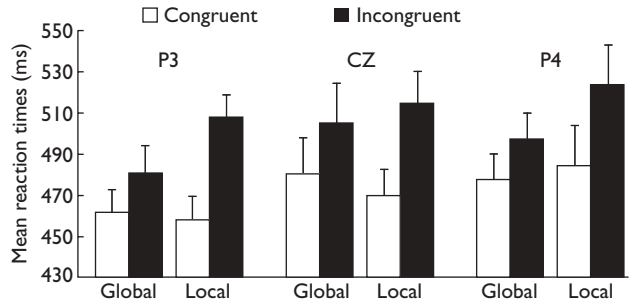

Fig. 2 Mean reaction time for global and local targets in congruent and incongruent conditions with rTMS over P3, CZ and P4. Error bars represent standard errors.

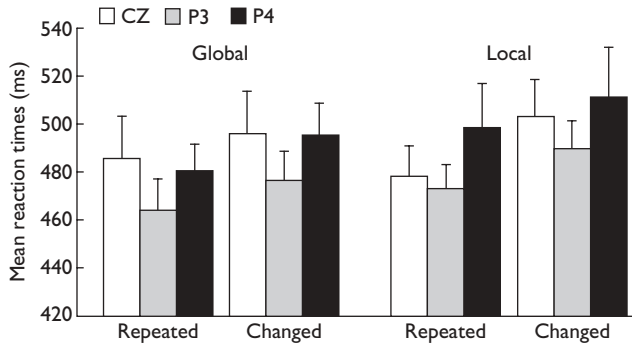

Fig. 3

TMS
P3. T TMS P4 . C
F(1,17)=191.67,
$P<0.001$ ×
F(1,17)=9.26, $P<0.01$,
- - - - . N TMS
. M
( ) - ( )
(F . 3). ANO A
F(1,17)=32.03, $P<0.001$ P3
. C ; F(1,17)=35.07, $P<0.001$ P4 .
C ,
. N ,
, , ($P>0.05$),
- TMS
P3, P4, C .

Discussion

T
TMS
. R

TMS ,
TMS
/
. O
- -
10 . I ,
- ,
8,9,16
TMS P3
TMS C .
TMS P4 , ,
/ . T
TMS
/
TMS
- ( )
17
. T TMS P3
M *et al.'* 13
TMS P3 - -
. I , TMS
MRI
12 . T TMS
1,3,18,19 ,
I
O ,
- TMS ,
TMS
. A
H *et al.* 20 P3 P4
. A TMS P4 -
- . A -
14 ,
. P

21,22 . A - 1 . O A , - 9 - 16 .

Conclusion

T - . T -

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T N N S; F C (P 30630025, 30225026, 30328016).

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