

### Introduction

The anterior cingulate cortex (ACC) and dorsolateral frontal cortex (DLFC) are key regions of the human brain involved in attention and performance. The ACC is primarily involved in monitoring and controlling behavior, while the DLFC is primarily involved in executive functions such as working memory and decision-making. The interaction between these two regions is critical for the successful execution of complex tasks. This study examines the role of the ACC and DLFC in attention and performance, using a task that requires the integration of information from multiple sources. The results show that the ACC and DLFC are both involved in the task, with the ACC playing a more prominent role in monitoring and controlling behavior, and the DLFC playing a more prominent role in executive functions. The findings suggest that the ACC and DLFC are both important for the successful execution of complex tasks, and that their interaction is critical for the integration of information from multiple sources.

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### Methods

The study was conducted using a task that requires the integration of information from multiple sources. The task involves the presentation of a sequence of notes, with the participant required to identify the notes that are played. The task is designed to be challenging, requiring the participant to maintain a high level of attention and performance throughout the sequence. The results show that the ACC and DLFC are both involved in the task, with the ACC playing a more prominent role in monitoring and controlling behavior, and the DLFC playing a more prominent role in executive functions. The findings suggest that the ACC and DLFC are both important for the successful execution of complex tasks, and that their interaction is critical for the integration of information from multiple sources.

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<sup>1</sup> K. N. et al., 2004; B. N. et al., 2004; <sup>2</sup> B. N. et al., 2004; B. N. et al., 2004; C. N. et al., 2004; B. N. et al., 2004.

... k-... (IE) ... (II) ... IE ... N ... IE ... II ... C ... IE ... II ...

... 6( )0 ... 6(I)- ... 2( )-84558(5( , 0.E)268(5-449( )

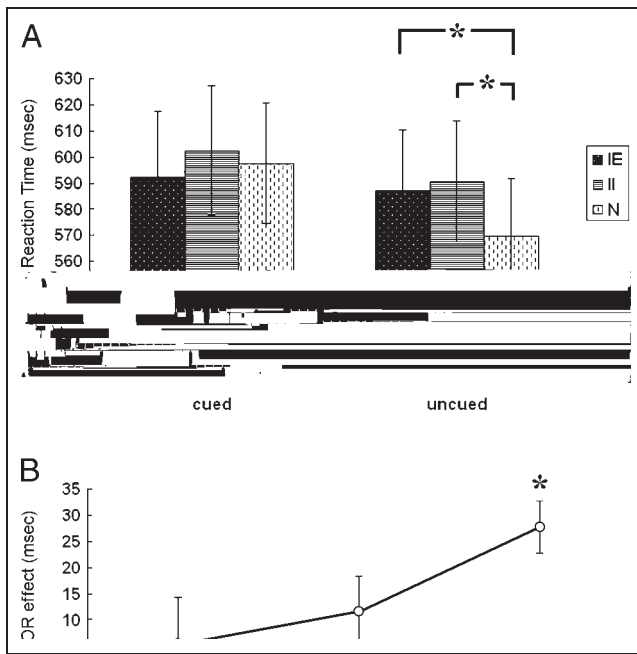
... ACC ... DL FC ... (B ... 2001, 2004; M ... 2000), ... DL FC ... I ... (2000) ... DL FC ... & ... 2001; ... G ... M ... & K ... 1995). ... I ... ( ... M ... D ... & ... 2004; L ... & ... 2002). ... I ... k.

... (7 ... 21 29) ... A ... k ... A ... C ... D ... k ...

... 2 ( ... ) × ... k ... k ... C ... k ...

... 500 ... A ...  
... 15 ...  
...

...



2. Behavioral results. (A) Reaction times (msec) for the cued and uncued conditions. (B) IOR effect (msec) for the cued and uncued conditions. \* indicates significant difference ( $p < .05$ ).

... I ... I ... F, ... C (IE II) ... (IE II) ... I ... I ... F, ... C (N) ... N ... 2 ... F, ... k ... Z ...

The Interaction between Pre-response Conflict and IOR

F, ... C (II N) ... (II N) ... I ... ACC ( ... F ... A).

2. Behavioral results. A, ... ANOVA ... C ... ( $p < .001$ , ... E, ... >60 ...)

Contrast	Anatomical Regions	Cluster Peak (x, y, z)	Z Score	Cluster Size (voxels)
(II N) ... C (II N)	L ... ACC (BA 32)	-16, 34, 3	4.22	77
C (IE II) ... (IE II)	L ... (BA 46)	-54, 26, 23	3.72	90
N ... C ... N	L FEF (BA 6)	-40, 4, 41	4.14	67

C ... (x, y, z), ... ( ... & ... , 1988).

B ... ACC ... F ... A ... B ... 2 x 2 AN ... ACC, F(1,11) = 55.80, p < .001, ... II ... t(11) = 2.37, p < .05, ... t(11) = 4.90, p < .001.

The Interaction between Response Conflict and IOR

F, ... C (IE II) ... (IE II) ... DL FC ( ... F ... B). A 2 x 2 AN ... B ... DL FC ... F ... B, ... F(1,11) = 2.85, p < .001. F ... DL FC ... IE ... II ... t(11) = 2.33, p < .05, ... t(11) = 6.12, p < .001. ... (IE ... F ... DL FC (x = -48, y = 32, z = 19, 78 ...), ... DL FC (x = 34, y = -54, z = -33, 84 ...).

IOR Effect for the Neutral Words

( ... 1 ... F ... 2) ... I ... II ... IE ... F ... I ...



ACC (ACC.M... ACC... (2001), M... (2001)... (2001).

An ACC (ACC, B... & ..., 2004; ..., 2001; M..., 2001; ..., 2001; B..., k..., 2004; ..., 2004... ACC..., B..., L..., (2000) ACC... ACC... ACC... H... k... ACC, ACC (B..., 2000... I... k... (..., & C..., 2005; M..., 2001, 2001; B..., 2000).

In ACC... k... (D..., & G..., 2001)... (..., 2001; ..., E..., & M..., 1991)... (M... & B..., 2005). E... ACC... k... (F... & F..., 2005), ACC... k... J... (2002) ACC... ACC... ACC... ACC... ACC... ACC... ACC... ACC... ACC... (..., 2001; K..., & ..., 1998)... (2001) ACC (..., )...

ACC... (A..., 1992; A... & M..., 1989)... k (K..., 1998). G... ACC... k...





... A, ... FEF ... ACC ... DLFC ... I ...

...

... C. N. ... (95-...-09) ... (0070260, 0470569, 6045010), ... (2004 CB 18101, 2005 CB 52800), ... E ... (01002, 02170). ... G ... D ... ND K ... (17-03/03) ...

... D. ... C. ... B. ... D. ... B. ... 100871, C. ... 104@k ...

A. ... B. (1992). ... Neuropsychologia, 30, 145-159.

L., F., K., K. A., & A. M. (2001). E n, z