

Global versus local: double dissociation between MT+ and V3A in motion processing revealed using continuous theta burst transcranial magnetic stimulation

Peng Cai · Nihong Chen · Tiangang Zhou · Benjamin Thompson · Fang Fang

Abstract

Background: The motion processing system is thought to be organized hierarchically, with the primary visual cortex (V1) at the bottom and the middle temporal visual cortex (MT) at the top. The MT is thought to be composed of two subregions, MT+ and MT-. The MT+ is thought to be involved in global motion processing, while the MT- is thought to be involved in local motion processing. The V3A is thought to be involved in both global and local motion processing. The present study investigated the role of MT+ and V3A in motion processing using continuous theta burst transcranial magnetic stimulation (CTBS).

Methods: Ten healthy participants were recruited for the study. They were divided into two groups: a CTBS group and a control group. The CTBS group received CTBS over the MT+ region, while the control group received CTBS over the V3A region. The participants performed a motion processing task before and after CTBS.

Results: The CTBS group showed a significant decrease in performance on the motion processing task compared to the control group. This decrease was observed for both global and local motion processing. The decrease in performance was significantly larger for global motion processing than for local motion processing.

Conclusions: The present study provides evidence for a double dissociation between MT+ and V3A in motion processing. The MT+ is involved in global motion processing, while the V3A is involved in both global and local motion processing. The present study also provides evidence for the role of CTBS in motion processing.

Keywords: Motion processing, CTBS, MT+, V3A, Double dissociation

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Methods

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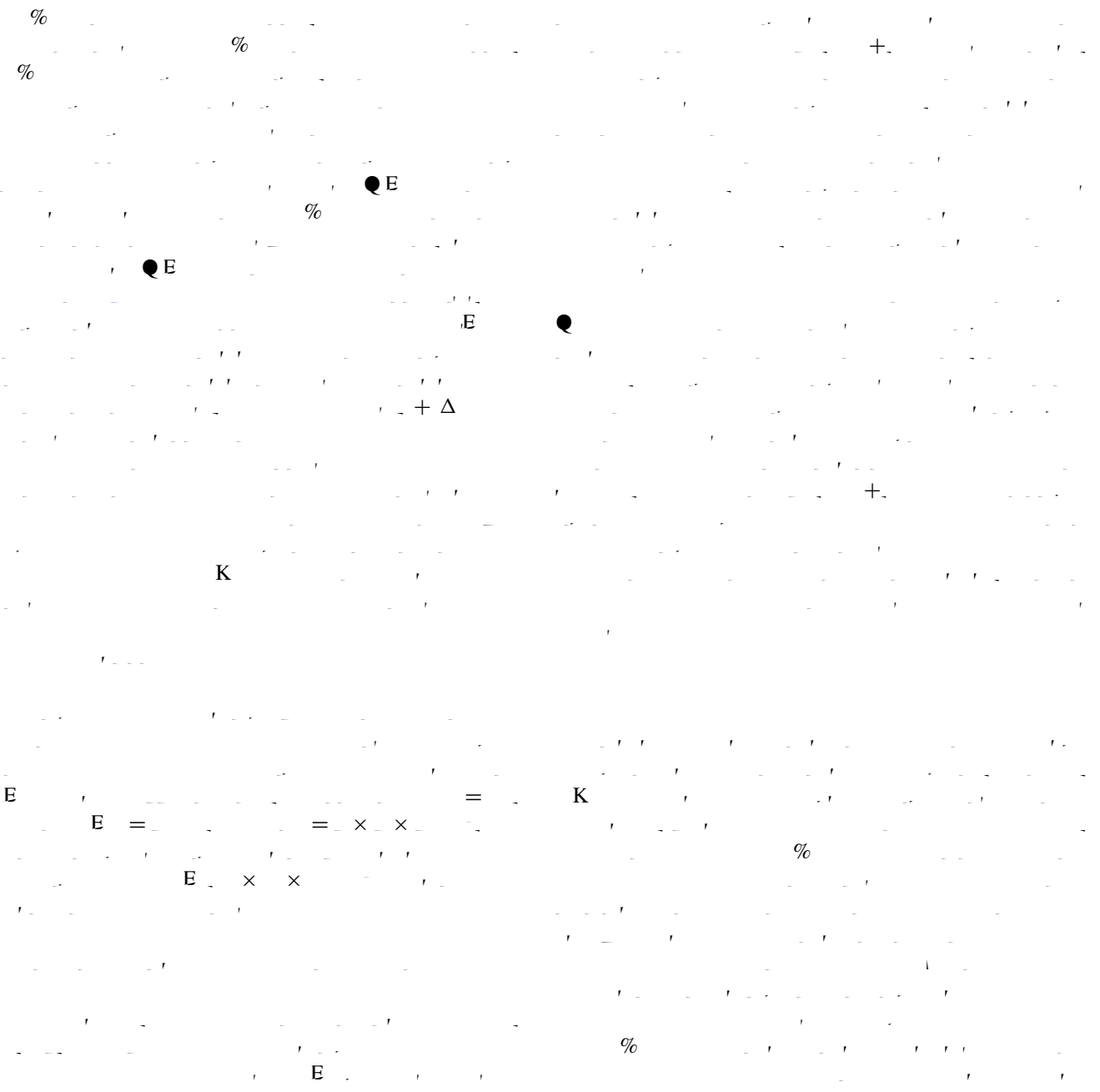
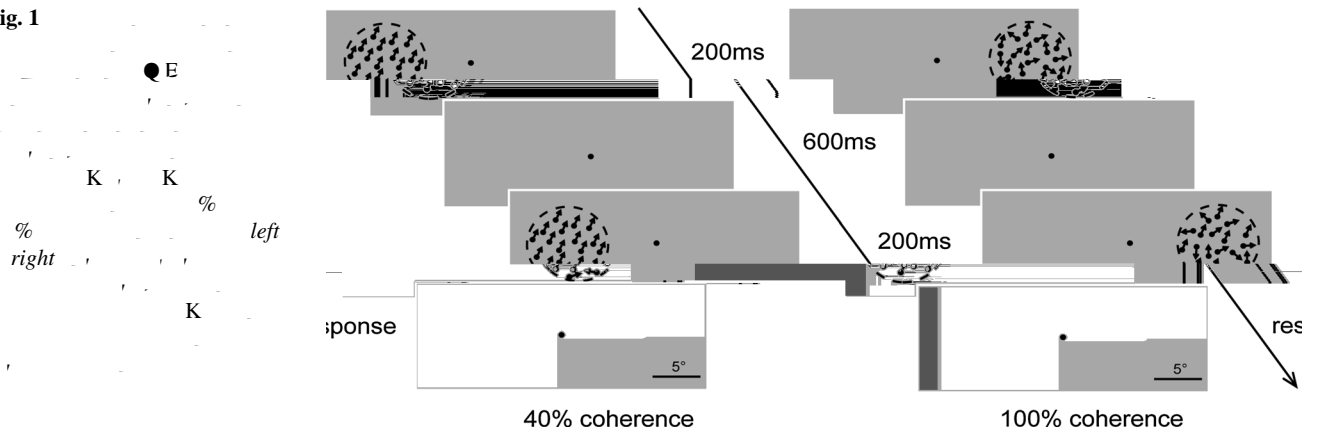
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Fig. 1



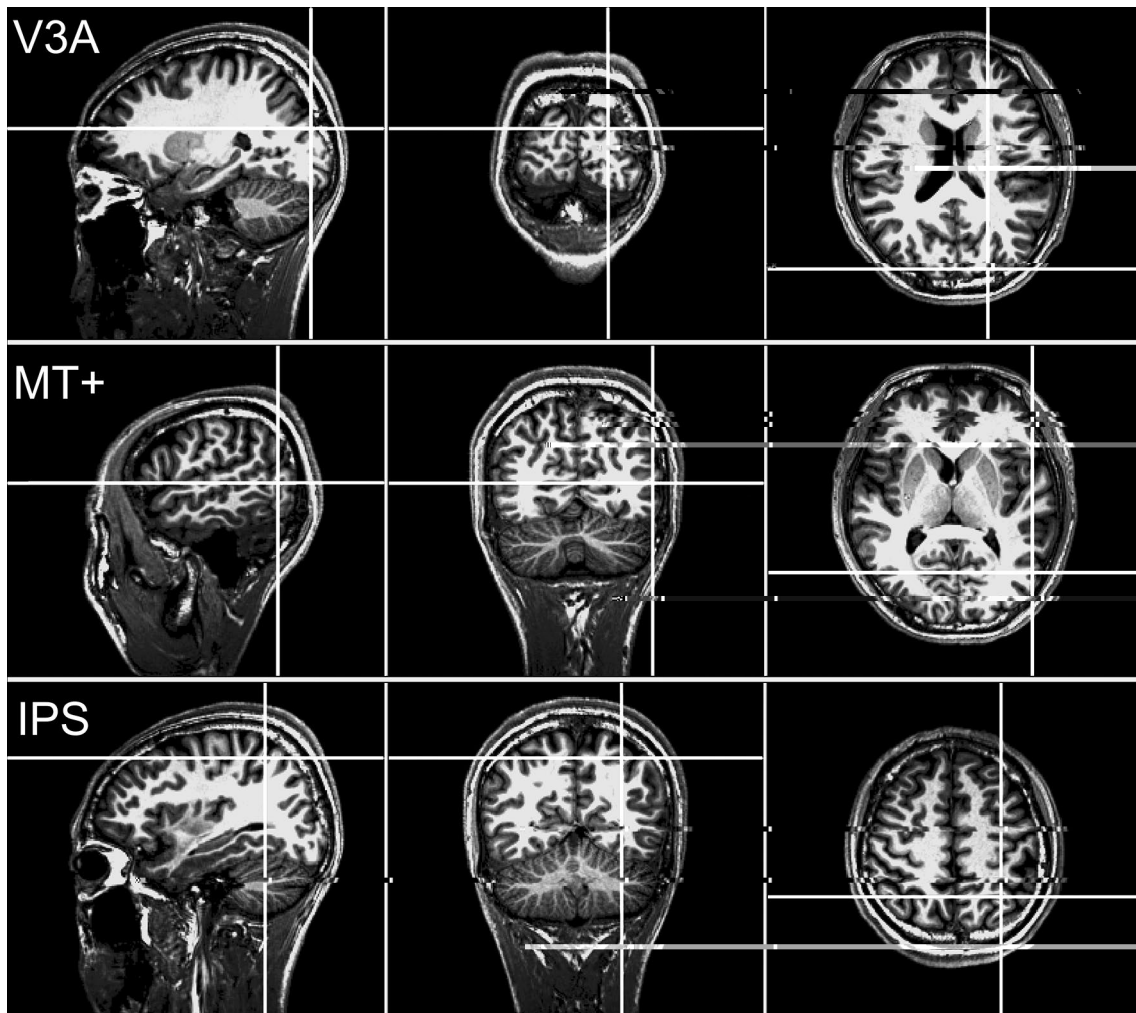


Fig. 2 *top row* + *middle row* *bottom row*

Results

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$F = \dots P < \dots$

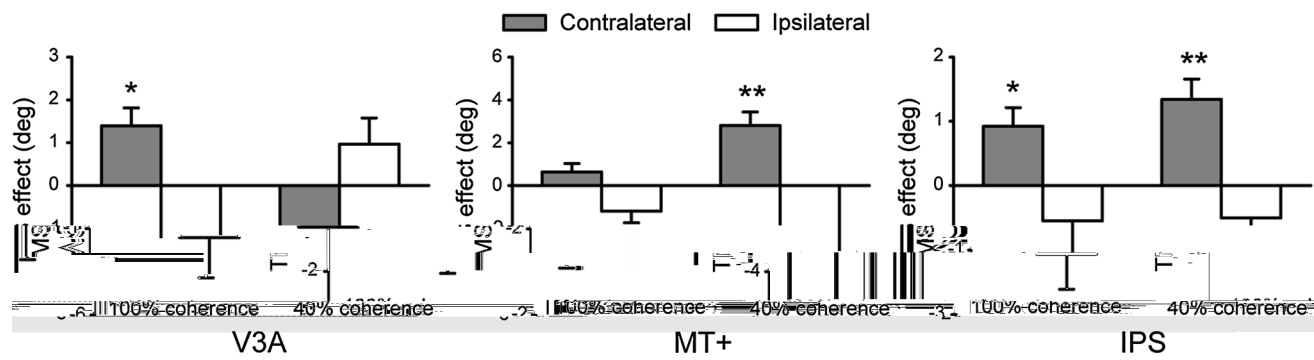


Fig. 3

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Discussion

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Acknowledgments

References

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