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Authors

Bek, Judith
Constable, Merryn D
Hilchey, Matthew
et al.

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The role of primary motor cortex in inhibition of return: An investigation using transcranial magnetic stimulation

Judith Bek
University of Toronto, Toronto, Ontario, Canada

Merryn Constable
Northumbria University, Newcastle upon Tyne, United Kingdom

Matthew Hilchey
University of Toronto, Toronto, Ontario, Canada

Timothy Welsh
University of Toronto, Toronto, Ontario, Canada

Abstract

Inhibition-of-return (IOR) is demonstrated by longer response times (RTs) for stimuli presented at previously attended locations than unattended locations. While facilitatory cueing effects occur at short stimulus onset asynchronies (SOAs) between a cue and target, IOR emerges at later SOAs. Frontoparietal areas including posterior parietal cortex have been implicated in producing IOR, but the contribution of primary motor cortex (M1) is unclear. In the present study, participants executed key-press responses to peripheral targets following a cue presented at the same or opposite location at different SOAs (100/300/600/1000ms). Single-pulse transcranial magnetic stimulation (TMS) was applied over right M1 on 50% of trials in a randomized (Experiment 1) or blocked (Experiment 2) order. IOR appeared to be attenuated by TMS, although RT profiles differed between experiments. Motor-evoked potentials were not altered by the cue-target relationship in either experiment. These findings do not support a key role of M1 in mechanisms of IOR.