



NEUROSCIENCE 2012

Presentation Abstract

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Presentation Title: [Understanding communicative actions: A repetitive TMS study.](#)

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Abstract: Previous work has shown that the right posterior superior temporal sulcus (RpSTS) is involved in inferring both instrumental goals and communicative intentions of observed actions (1, 2), using previous knowledge to generate perceptual and/or conceptual inferences (3, 4). Here, we disturb neural activity in RpSTS to test whether this region is necessary for understanding the meaning of novel communicative actions.
Thirteen subjects received two 20 min sessions of low-frequency (1 Hz) repetitive transcranial magnetic stimulation (rTMS), either over RpSTS (50,-42,14) or over a control region (area MT+, -43,-70,10), before performance of a communicative game and a control task. The game involved controlled non-verbal communicative interactions between pairs of subjects (40 trials). Each pair was asked to jointly create a goal configuration of two geometrical tokens, using the movements of the tokens on a gameboard as the only available communicative channel (5). One participant (a confederate) knew the goal configuration, and she moved her token on the gameboard to inform an addressee (a participant) where and how to position his token. The control task was a visual search paradigm that involved the same stimuli, responses, joint attention, and inter-subjects dependencies, but no communicative necessities. Performance was indexed by Task Efficiency, defined as the number of correct responses per unit of planning time, and by Efficiency Rate, defined as the rate of change (across trials) in Task Efficiency. After rTMS over RpSTS, but not left MT+, the Efficiency Rate of the addresses was reduced in the communicative game, but not in the visual search. In contrast, after rTMS over left MT+, subjects were not able to benefit from experience gained during the previous trials of the visual search task (Task X Site interaction, $p < 0.05$). There were no

corresponding interactions between tasks and site of rTMS intervention on the Task Efficiency parameter.

These findings qualify how RpSTS contributes to understanding the meaning of non-verbal communicative actions. Repetitive TMS over RpSTS did not disrupt the ability of addressees to interpret novel communicative actions. Rather, this region appears to be necessary for incorporating previous knowledge, accumulated during interactions with a communicative partner, to constrain the inferential process that leads to action understanding.

References:

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