

TRANSCRANIAL MAGNETIC STIMULATION OF SOMATOSENSORY LARYNX CORTEX ALTERS PITCH-MATCHING ACCURACY AND NEURAL ACTIVATION PATTERNS IN OCCASIONAL SINGERS

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ABSTRACT:

Our previous fMRI studies on vocal motor expertise indicate that trained singers rely more on somatosensory feedback integration to regulate vocal motor output compared to non-singers. Following up on these results, the current series of studies employed intermittent theta burst stimulation (iTBS), a form of facilitating repetitive transcranial magnetic stimulation (TMS), to test the causal contribution of primary somatosensory cortex (S1) to pitch matching accuracy in occasional. Employing a pre-post stimulation paradigm, we targeted right larynx-S1 and a dorsal-S1 control region with iTBS in 14 musically untrained participants. Behavioral stimulation effects were assessed using a pitch-matching singing task, in which participants were to sing back musical intervals while auditory feedback from the own voice was masked with noise. We found that larynx-S1 but not the dorsal-S1 stimulation improved initial pitch accuracy and final pitch stability. Moreover, these effects were stronger in those participants who also showed lower baseline performance. This may indicate that enhanced somatosensory processing may be particularly advantageous for improving vocal motor control in poor singers. In a follow-up study with 13 non-singers, we applied iTBS to both left and right larynx S1 relative to a dorsal S1 control region. Behavioral stimulation effects were again assessed using a pitch-matching accuracy paradigm. Moreover, corresponding neural activation patterns were assessed with fMRI as a function of stimulation site. Results from the fMRI study are currently being analyzed and will be presented at the conference.