Poster Presentation: *#P4*
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Effects of continuous theta-burst stimulation on stereoscopic vision

Electrical brain stimulation over the primary visual cortex has been shown to have a significant and prolonged effect on a range of visual capacities for both healthy people and individuals with visual impairment. Particularly, previous work has shown that continuous theta-burst stimulation (cTBS) of the right primary visual cortex can temporarily improve stereoacuity in adults with amblyopia. Still other work, however, has reported that cTBS over the parietal cortex produces significant deficits in stereopsis of normally-sighted individuals by attenuating early disparity responses. Here, we aim to assess the effects of cTBS over the primary visual cortex in isolation, or in combination with perceptual training (PT), on stereoscopic function of normally-sighted observers.

Stereopsis is one of the most crucial visual computations that allow an impression of depth. Depth perception is served by binocular neurons in the primary visual cortex, extending to higher areas along ventral and dorsal pathways. The dorsal visual areas, including the posterior parietal cortex and the medial temporal area, play a significant role in segmenting objects from noisy backgrounds, while the ventral cortex serves fine feature discriminations. Here, we index stereoscopic function in terms of a signal-noise task, as perceptual training on a signal-in-noise disparity task has been shown to support the broadest degree of learning that generalizes to other visual features. Moreover, previous work showing enhancements in performance following cTBS involved noise-segmentation paradigms only.

In this study, participants will be required to judge the depth position of a central target relative to a surround. Task difficulty will vary by adjusting the signal-to-noise ratio defining the number of dots that coherently define the disparity plane versus a random disparity. Participants will be randomly assigned to one of the four groups – PT alone, cTBS alone, PT-cTBS, and cTBS-PT, and stereoscopic performance will be indexed both pre- and post-manipulation. We predict that combining cTBS and PT will lead to compounded effects that benefit stereoscopic performance more than effects from either cTBS or PT alone.