

SEMINAR ANNOUNCEMENT

FUNCTIONAL CHANGES IN THE HUMAN CORTEX OVER THE COURSE OF VISUAL PERCEPTUAL LEARNING

Beyza Akkoyunlu, MSc Candidate in Neuroscience

Advisor: Assoc. Prof. Hüseyin Boyacı

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ABSTRACT

In this study we assessed functional changes through visual perceptual learning with bisection discrimination task. Before learning, after third session of learning and after learning ended, behavioral threshold and fMRI data has been collected. Our results showed that while participants showed threshold decrease in the mid-learning session, the post-learning thresholds are turned to pre-learning levels. This results might be a result of fatigue of the our experiment. Besides to training condition, we also tested location and task specificity. The results showed that only 150° polar angle location showed significant change between sessions. Along with the behavioral data, we collected task-based fMRI data while participants performing training and control conditions in the scanner. The analysis showed no significant change at any condition in the BOLD amplitude in the time-course of learning. The resting state functional connectivity analysis showed that the functional connectivity between V1 and V2 regions are

significantly increased. The Post Hoc analysis showed significant change in the 210° and 150° polar angle conditions. The changes in the behavioral and functional connectivity measurements at 150° polar angle conditions, these results might indicate the effect of the inter-hemispheric connections. Moreover, our analysis on resting state data also revealed that, while there is no change between pre-learning and mid-learning sessions, connectivity changes significantly in the post-learning session compared to other sessions. This finding introduces the idea that functional connectivity changes related to perceptual learning might be occurring at the late phases of the learning. Overall, to rule out the confounds in the behavioral measurements and link the behavioral data with neural data, additional measurements should be taken in the future.

Keywords: visual perceptual learning, bisection discrimination task, functional magnetic resonance imaging, resting state functional connectivity