**Anterior and posterior lateral OFC networks make dissociable contributions to stimulus-outcome learning and goal-directed choice**

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Previous work across species has implicated the lateral orbitofrontal cortex (OFC) in guiding reward learning and goal-directed behaviors. However, the lateral OFC is a large and anatomically heterogeneous area, and the precise roles of its subregions remain largely unexplored. Here, we investigated the contributions of the anterior (aOFC) and posterior (pOFC) portions of the lateral OFC in reward learning and goal-directed behaviors. 48 fasted human subjects (15 males) completed a 3-session x 2-day outcome devaluation experiment with transcranial magnetic stimulation (TMS). On day 1 of each session, subjects learned associations between visual stimuli and food odor rewards. For a given pair of stimuli, one stimulus predicted a sweet or savory food odor, whereas the other stimulus predicted no reward. On day 2, subjects first consumed a meal that was matched to either the sweet or savory food odor (counter-balanced), decreasing the pleasantness of the food-matched (i.e., sated) odor. Then subjects made choices among visual stimuli predicting non-sated or sated odors. A preference for choosing stimuli predicting non-sated over sated odors indicates goal-directed choice. To probe the differential roles of lateral OFC subregions, we targeted aOFC and pOFC either before learning the stimulus-outcome associations on Day 1 or before the meal and choice test on Day 2. To selectively target the aOFC and pOFC (in different groups of subjects), we used resting-state fMRI connectivity analyses to individually select stimulation sites in right lateral prefrontal cortex (LPFC) that were maximally connected to seed regions in the aOFC and pOFC, respectively. We applied continuous theta burst stimulation (cTBS) to temporarily disrupt brain network function over these stimulation sites. Targeting the aOFC network disrupted learning of stimulus-outcome associations on Day 1, whereas targeting the pOFC network had no effect compared to sham TMS. Conversely, targeting the pOFC network disrupted goal-directed choices on Day 2, whereas targeting the aOFC network had no effect relative to sham TMS. These results reveal distinct contributions of anterior and posterior portions of the lateral OFC to reward learning and goal-directed choice.