**Posterior orbitofrontal cortex contributes to the acquisition and use of stimulus-outcome associations for goal-directed behavior**

Previous work across species has implicated the lateral orbitofrontal cortex (OFC) in goal-directed behavior. A key signature of goal-directed behavior is the ability to flexibly adjust choices for specific outcomes when their value changes. This requires both representations of stimulus-outcome associations and their use for inferring the updated value of outcomes. Whereas lesions and inactivation of the OFC disrupt goal-directed behavior, it is unclear which of these two functions the OFC supports. Moreover, the lateral OFC is an anatomically heterogeneous region, and different functions underlying goal-directed behavior may be distributed across different subregions. To address these questions, here we used transcranial magnetic stimulation (TMS) to disrupt activity in functional brain networks centered on the anterior (aOFC) and posterior (pOFC) part of the lateral OFC. To dissociate the acquisition and use of stimulus-outcome associations, participants (n=48) received aOFC or pOFC network -targeted TMS either before learning associations between visual stimuli and sweet or savory food odor rewards, or, on the next day, before a meal to selectively devalue one of these rewards, which was followed by a probe choice test in extinction. Crucially, TMS targeting the pOFC (but not the aOFC) before the meal disrupted goal-directed behavior, as measured by choices of stimuli predicting non-sated rewards in the probe test. Importantly, disrupting the pOFC (but not the aOFC) before learning stimulus-outcome associations similarly impaired behavior in the probe test on the next day. These findings show that the pOFC contributes to goal-directed behavior by supporting both the acquisition and use of stimulus-outcome associations.