Treating Phobia With Multivoxel Neuro-reinforcement

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1. H1: We will use a freesurfer segmented amygdala ROI to isolate amygdala activity. Amygdala response measured via BOLD signal to phobic stimuli will be baseline corrected by the amygdala activation corresponding to non-feared animal. Then, these extracted BOLD signals will be subjected to a repeated-measures ANOVA with 2 within-subject factors of time (Pre- and Post-treatment) and Condition (target and control) followed by twosided paired-sample t-tests.
2. H2: We will determine skin conductance responses during a time window beginning 1 second and ending 5 seconds after stimulus presentation. The amplitude of the response will be determined by subtracting the mean baseline activity during 2 seconds preceding the onset of the image from the maximum value in this time window. Responses smaller than 0.02 microsiemens (μS) will be recorded as 0 following previous procedures (Schiller et al., 2010; Schiller et al., 2013; Taschereau-Dumouchel et al., 2018). Responses will be square root transformed to correct for skewness of the distribution of the skin conductance response (Boucsein et al., 2012; Koizumi et al., 2016).

    1. A hierarchical mixed effects model will be carried out with trials nested in subjects. The model will include 3 fixed effects (Time, Condition, and Time * Condition), and the coefficients of Time and Conditions will be allowed to have random components to correct for potential clustering of errors within subject (Raudenbush & Bryk, 2002).
    2. Simple effects analyses will be carried out using two-sided paired sample *t*- test, and by splitting the data by Condition.

3. H3: Fear ratings for each stimulus category (as described in *4.*) will be averaged.

    1. A hierarchical mixed effect model with 3 fixed effects (Time, Condition, Time * Condition) will be carried out.
    2. Simple effects will be tested using two-sided paired sample *t*-test.