Depression Severity Relates to Lower Information Encoding in the RewP Following High Positive-Affect Feedback

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The Reward Positivity (RewP) is a positive deflection in the EEG sensitive to reward receipt. Recent evidence suggests that the RewP is modulated by both reward probability as well as affective valuation ("liking"). We hypothesize that this latter "liking" feature is specifically affected in major depression. We recruited 69 participants (MDD =35, Control= 34) who completed a reinforcement learning task (green or red screen feedback) with concurrent affective images. We specifically examined the modulation of the RewP when paired with hedonically preferred images (puppies) vs. less-preferred images (cows). There was no group difference in "liking" ratings of puppy or cow pictures, nor were there differences in RewP between groups. Our next hypothesis was that the affective information encoding (EEG-RPE Correlation) will be affected by depression severity. Across all participants, we found a significant correlation between BDI score and EEG-RPE encoding for hedonically affective imagery in depression group (win puppy; r= -0.39, p=0.02) confirming our hypothesis. Our results indicate an inter-individual influence of self- reported depression on Prediction Error Correlation for hedonic imagery. These findings suggest a motivation- specific diminution of hedonic encoding and responsiveness in people with high symptoms of depression.

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