Blunted Neural Responses to Reward in Remitted Major Depression: A High-Density Event-Related Potential Study

Supplemental Information

PRT Quality Control Criteria

Participants were excluded if more than 10% of trials were outliers. Additionally, subjects were required to perform above chance accuracy ($\geq$55%) to ensure that they were exposed to the intended asymmetrical (3:1) reinforcement schedule.

Artifact Rejection Criteria

Artifacts were rejected using a semi-automated procedure with a maximal allowed voltage step of 50 µV between sample points, a maximal voltage difference of 150 µV within a 100-ms interval, and a minimum allowed voltage of 0.5 µV within a 100-ms interval. Subjects were only considered for inclusion in ERP analyses if their behavioral PRT data passed quality control criteria.

Of the 60 possible segments of ERP data recorded, the mean number of usable, artifact-free segments across the entire sample was 57.78 (SD = 2.43, Min = 48, Max = 60). For controls, the mean number of artifact-free segments was 57.76 (SD = 2.53, Min = 48, Max = 60) and for the rMDD group the mean was 57.81 (SD = 2.34, Min = 53, Max = 60).

LORETA ROI Voxel Numbers

The following voxels were included in the respective ROIs:

ROI	Voxel Number
Posterior OFC:	351, 360, 561, 568
vmPFC:	784, 791, 792, 799, 1184
pgACC:	962, 1152, 1327
ACC metacluster:	1495, 1502, 1654, 1660
PCC:	1590, 1765, 1770
Pre-SMA:	1998, 1999, 2147, 2151
Right anterior insula:	756, 764
Left anterior insula:	544, 753, 761

Additional Behavioral Findings

Accuracy. A *Group* x *Block* x *Stimulus* interaction emerged for accuracy on the PRT, $F_{(1,57)} = 4.07$, $p = .048$, $\eta_p^2 = .07$. In controls, accuracy to the rich stimulus increased across blocks ($p = .04$), whereas accuracy to the lean stimulus decreased across blocks ($p = .003$). In contrast, the rMDD group showed no changes in accuracy to either the rich or lean stimulus (both $ps > .05$). There were no differences between groups at either block (both $ps > .05$; Fig. S1A).

Reaction Time. There was a significant *Group* x *Block* interaction for reaction time (RT), $F_{(1,57)} = 4.56$, $p = .04$, $\eta_p^2 = .07$. For controls, RT decreased across blocks ($p < .001$) but there was no change in the rMDD group ($p = .39$). There were no differences between groups at either block (both $ps > .05$; Fig. S1B).

Associations with Depression Chronicity

In the rMDD group, a higher number of previous depressive episodes was associated with a trend-level reduction in overall response bias on the PRT (r = -.36, p = .07). Furthermore, a greater number of months in remission was associated with a significantly higher PRT delta score (r = .45, p = .02). There was no correlation between the number of prior depressive episodes or time in remission and the amplitude at PCA factor TF4/SF2 or reward-related activity in the ACC LORETA clusters (all ps > .05).
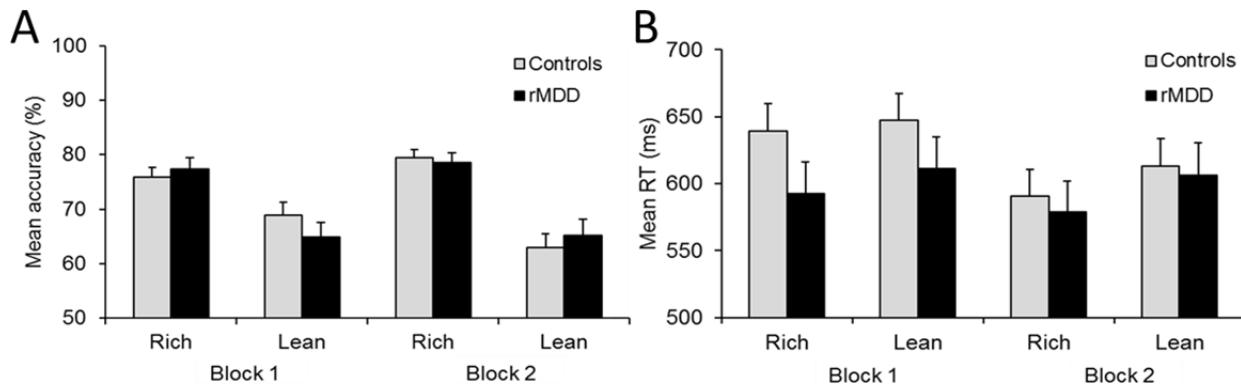

Figure S1. Mean accuracy (**A**) and RT (**B**) for the rich and lean stimuli across block 1 and block 2 of the PRT (+SEM) for the control and remitted depressed (rMDD) groups.