**Dimensional Anhedonia and the Adolescent brain: Reward and Aversion Anticipation, Effort and Consummation.**

**Short title**:

Anhedonia in adolescent depression

15. Swallow cue (2 sec)

14. Rinse delivered (5 sec)

**Figure S1.** Visual depiction of a reward-hard trial.



16. Blank (0.8-1.5 sec jittered)

15. Rinse (5 sec)

1. Cue (2 sec)

 2. Fixation (1-3 sec jittered)

3. Wanting (5 sec)

4. Fixation (1-3 sec jittered)

5. Effort (6 sec)

7. Command cue (2 sec)

8. Taste (5 sec)

9. Swallow (3-5 sec jittered)

10. Pleasantness (5 sec)

11. Fixation (1-3 sec jittered)

11. Intensity (5 sec)

12. Grey image (2 sec)

13. Fixation (1-3 sec jittered)

14. Command cue (2 sec)

6. Fixation (1-3 sec jittered)

Table S1: Subjective ratings for all participants.

|  |  |  |
| --- | --- | --- |
|  | Chocolate mean (SD) | Aversivemean (SD) |
| Wanting | 1.52 (.38) | -1.7 (.29) |
| Liking | 1.47 (.38) | -1.54 (.49) |
| Intensity | 2.32 (.71) | 2.44 (.8) |

Table S2: Subjective ratings for DS and HC groups.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Group |  |  |
| Ratings | DS  |  HC | DS  | HC | DS |  HC |
|  | Chocolate | Aversive | Tasteless solution |
| Picture wanting; mean (SD) | 1.43 (.45) 1.62 (.25)  | -1.75 (.33) -1.75 (.25) |  |
| Taste liking; mean (SD) | 1.38 (.44) 1.56 (.28) | -1.52 (.47) -1.55 (.48) | .67 (.9) .57 (.85) |
| Taste intensity; mean (SD) | 2.28 (.77) 2.37 (.63) | 2.38 (.85) 2.51 (.74) | 1.25 (.87) 1.53 (1) |

Table S3: Number of button presses for effort phase for DS and HC groups.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | DS; mean (SD) | HC; mean (SD) |  |  |
| *Button presses* |  |  |  |  |
| Reward Easy | 31.77 (1.27) | 32 (1.1) |  |  |
| Reward Hard | 41.25 (4.13) | 43.33 (4.44) |  |  |
| Aversive Easy | 31.42 (1.51) | 31.81 (.91) |  |  |
| Aversive Hard | 42.93 (4.67) | 44.48 (4.69) |  |  |
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Table S4: Medication status of participants with MDD diagnosis.

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| **Participant ID** | **Medicated during study** | **History of medications** |
| 1 | Citalopram 10mg | Sertraline |
| 2 | - | Bupropion, Fluoxetine, Sertraline, Mirtazapine |
| 3 | Fluoxetine 50mg | - |
| 4 | Sertraline 100mg |  |
| 5 | - | Fluoxetine 20-60mg, Sertraline 50mg |
| 6 | Sertraline 100mg | Citalopram |
| 7 | Sertraline | - |
| 8 | - | Fluoxetine 20mg |
| 9 | Citalopram 20mg | - |
| 10 | Citalopram 40mg | - |
| 11 | - | Citalopram 20mg |
| 12 | Citalopram 30mg | - |
| 13 | Fluoxetine 40mg | - |
| 14 | Sertraline 10mg | - |
| 15 | Fluoxetine 60mg | - |
| 16 | - | Fluoxetine 20mg |
| 17 | - | Citalopram 20mg |
| 18 | Paroxetine 20mg | - |
| 19 | - | Citalopram 20mg |
| 20 | - | Fluoxetine 20mg |
| 21 | Citalopram 40mg | - |
| 22 | Sertraline 50mg | - |

Table S5: Regions showing whole brain responses to each phase in all participants.

|  |
| --- |
|  Whole Brain MNI coordinates |
| Brain region | X | Y | Z | z-value | p-value |
| **Anticipation** |
| ***Reward cue***Occipital lobe (BA18)Occipital lobe (BA18)SFG (BA8)MFG (BA10)pgACC/vmPFCpgACC/vmPFC***Aversive cue***Occipital lobe (BA17)Occipital lobe (BA18)pgACC/vmPFCSFG (BA8)Parietal lobe (BA40)SFG (BA9)MFG (BA10)**Effort** ***Gain Reward: Choc hard-choc easy***Primary motor (BA4)Insula (BA13)MFG premotor (BA6)Parietal (BA40)PutamenSFG (BA9)Insula (BA13)***Avoid Aversion: Aver hard-Aver easy***Primary motor (BA4)Occipital lobe (BA18)MFG premotor (BA6)Insula (BA13)Primary motor (BA4)Insula (BA13)SFG (BA9)**Consummation** ***Chocolate Taste***dACC (BA33/24)Mid OFC (BA11)ACC (BA24)***Aversive taste\****CaudateMFG premotor (BA6)dACC (BA32) | -16181434-14616-16101460-2834-32-42-456-282640-34-260-4828-38342220160-2 | -94-9246545048-86-944846-445454-24-26-22-320566-26-92-10-22-24-2050123028181432 | 8652424-282523430450204822-4300582561856-63224-1220124220 | 10.339.517.485.385.294.937.175.745.675.415.315.137.687.686.25.435.285.1657.577.486.326.105.745.335.294.94.924.843.823.883.07 | <0.001<0.001<0.001=0.001=0.002=0.005<0.001<0.001<0.001<0.001<0.001=0.004=0.003<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001<0.001=0.008<0.001<0.001=0.006=0.002=0.002=0.002 |

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Thresholded at p<0.05 FWE whole brain corrected. Clusters corrected p<0.05 FWE.

\* Thresholded at p=0.01 uncorrected. OFC- orbitofrontal cortex; ACC- anterior cingulate cortex; MFG- middle frontal Gyrus; SFG- superior frontal gyrus.