Supplementary Materials for “Vicarious Effort-Based Decision-Making in Autism Spectrum Disorders”

\*Mosner, M.G., Kinard, J.L., McWeeny, S., Shah, J.S., Markiewitz, N.D.,Damiano-Goodwin, C.R., Burchinal, M.R., Rutherford, H.J.V., Greene, R.K., Treadway, M.T., & Dichter, G.S.

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**Difference scores results**

Difference scores were calculated to investigate sensitivity to change in reward parameters. Separate ANOVAs were conducted to examine the effect of increasing reward magnitude and reward probability levels on percentage of hard task choices for adolescents with and without ASD across conditions (Self, Other). The present results are compared to findings from the primary omnibus ANOVA presented in the main manuscript.

The first omnibus model was a 2 (Group: ASD, TDC) x 3 (Change in Magnitude: Large vs. Small; Large vs. Medium; Medium vs. Small) × 2 (Agency: Self, Other) repeated measures ANOVA. Similar to results of the primary omnibus ANOVA, results revealed an Agency × Group × Change in Magnitude interaction, *F*(2,79)=3.80, *p*=.03, reflecting that groups differed on the influence of Change in Magnitude in the Self relative to the Other condition. Additionally, there was a main effect of Change in Magnitude, *F*(2,79)=50.63, *p*<.0001, with greater differences between reward magnitude levels associated with greater percentage of hard task choices across groups. Contrary to primary analyses, there was no Agency × Group interaction.

The second omnibus model was a 2 (Group: ASD, TDC) x 3 (Change in Probability: High vs. Low; High vs. Medium; Medium vs. Low) × 2 (Agency: Self, Other) repeated measures ANOVA. Results revealed an Agency × Change in Probability interaction, *F*(2,79)=5.70, *p*=.005, indicating that responses to increases in reward probability differed for Self and Other conditions. This finding was not observed in the primary omnibus ANOVA. In addition, there was a main effect of Change in Probability, *F*(2,79)=46.33, *p*<.0001, with greater differences between reward probability levels associated with greater percentage of hard task choices across groups.

----------------Insert Table 7 Here----------------

----------------Insert Table 8 Here----------------

**Follow-Up Analyses.** Results for follow-up between group analyses are presented in Table 7 revealing several group differences in change in effort-based decision-making across Probability and Magnitude for both Self and Other. Results for within-group analyses are included in Table 8 and reveal differences between difference scores for Self and Other effort-based decision-making within the ASD and TDC groups.

|  |  |
| --- | --- |
| Table 7*Follow-up Between-Group t-tests for Self and Other conditions of the EEfRT* |  |
| Self | **Change in Magnitude** | **ASD-TDC *t*(*p*)** | **Cohen’s *d*** |
|  | Large-Small | -0.35 (.73) | 0.08 |
|  | Large-Medium | 1.44(.15) | 0.32 |
|  | Medium-Small | -1.47(.15) | 0.33 |
|  | **Change in Probability** |  |  |
|  | High-Low | -1.07(.29) | 0.24 |
|  | High-Medium | -1.20(.23) | 0.26 |
|  | Medium-Low | -0.27(.79) | 0.06 |
| Other | **Change in Magnitude** | **ASD-TDC *t*(*p*)** | **Cohen’s *d*** |
|  | Large-Small | \*-2.21(.03) | 0.51 |
|  | Large-Medium | \*\*-2.69(.009) | 0.63 |
|  | Medium-Small | -0.44(.66) | 0.10 |
|  | **Change in Probability** |  |  |
|  | High-Low | -1.63(.11) | 0.37 |
|  | High-Medium | -1.46(.15) | 0.33 |
|  | Medium-Low | -0.80(.42) | 0.18 |

\**p*<.05, \*\**p*<.01

Table 8

*Follow-up Within-Group t-tests in the ASD and TDC Groups* *for the EEfRT*

|  |  |  |  |
| --- | --- | --- | --- |
| **Self-Other** | **Change in Magnitude** | **ASD *t*(*p*)** | **Cohen’s *d*** |
|  | Large-Small | 1.65(.11) | 0.24 |
|  | Large-Medium | \*2.05(.05) | 0.45 |
|  | Medium-Small | -0.53(60) | 0.08 |
|  | **Change in Probability** |  |  |
|  | High-Low | 0.10(.92) | 0.09 |
|  | High-Medium | -0.05(.96) | 0.05 |
|  | Medium-Low | 0.13(.90) | 6.02 |
| **Self-Other** | **Change in Magnitude** | **TDC *t*(*p*)** | **Cohen’s *d*** |
|  | Large-Small | -0.75(.46) | 0.15 |
|  | Large-Medium | \*-2.07(.05) | 0.48 |
|  | Medium-Small | 0.77(.45) | 0.17 |
|  | **Change in Probability** |  |  |
|  | High-Low | -1.25(.22) | 2.19 |
|  | High-Medium | -0.42(.68) | 0.32 |
|  | Medium-Low | -0.53(.60) | 3.46 |

\**p*<.05