**Appendix**

Donohue, M.R., Hoyniak, C.P., Tillman, B.T., Barch, D.M., & Luby, J. Associations of observed callous-unemotional behaviors in early childhood with conduct problems and substance use over 14 years

Methods

p.2: Supplement 1; Table S1. *Validity of observed CU behavior measure in the current sample (N=189)*

Results

p. 3-4: Table S2. *Logistic Regression Models of Subsequent ODD/CD Diagnoses by Whether or Not Children Tore the Photo (N=170)*

p. 5: Table S3. *Multinomial Logistic Regression Models of Concurrent ODD/CD Diagnoses by Observed CU Behaviors (N=189)*

p. 6: Table S4. *Multinomial Logistic Regression Model of Subsequent ODD/CD diagnoses by Observed CU Behaviors in Subjects with Early-Starting Conduct Problems (n=63)*

p. 7:Figure S2*. ROC Curve of Subsequent ODD/CD Diagnoses by CU Behaviors Sum Score in Tearers (N=170)*

p. 8: Table S5. *Multinomial Logistic Regression Models of Non-Conduct Disorder Diagnoses by Observed CU Behaviors (N=170)*

p. 9 Table S6. *Multilevel Models of Observed CU Behaviors Predicting Subsequent Non-Conduct Disorder Symptom Severity (N=170)*

p.10-11Table S7. *Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors in Picture Tearers and Non-Tearers (N=170)*

p.12 Table S8. *Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems in Picture Tearers and Non-Tearers (n=72)*

p. 13-14 Table S9*. Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use in Picture Tearers and Non-Tearers (n=170)*

p.15-16Table S10*. Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Age as a Moderator (N=170)*p .17-18 Table S11*. Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Sex as a Moderator (N=170)*

p.19Table S12*. Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems with Age as a Moderator (N=170)
p.20* Table S13*. Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems with Sex as a Moderator (N=170)*

*p.21* Table S14*. Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use with Age as a Moderator (n=72)
p.22* Table S15*. Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use with Sex as a Moderator (N=170)*

p. 23-24: Table S16. *Multilevel Models of* *Subcomponents of CU Behaviors Scale Predicting Subsequent ODD and CD Symptom Severity (N=170)*

p. 25-26: Table S17. *Multilevel Models of* *Subcomponents of CU Behaviors Scale Predicting Subsequent ODD Symptom Severity (N=170)*

p. 27-28: Table S18. *Multilevel Models of* *Subcomponents of CU Behaviors Scale Predicting Subsequent CD Symptom Severity (N=170)*

p. 28-29*:* Table S19*: Multiple Regression Models of Subcomponents of CU Behaviors Scale Predicting Subsequent Age of Substance Use Onset (n=72)*

**Methods**

*Supplement 1* – Validity of observed CU behavior measure in the current sample

Linear regression analyses were conducted to assess the validity of the observed CU behaviors measure used in the present study by examining whether it was associated with low empathy, guilt, and prosocial behavior in this sample. Components of morality were measured at T1-3 with the My-Child questionnaire1, a 100-item assessment of early moral development with demonstrated reliability and validity in preschool samples. We examined two subscales that assessed children’s 1) guilt (e.g., ‘feels bad when reminded about wrongdoing’), and 2) empathy and prosocial behavior (e.g. ‘asks, “what’s wrong?” when seeing someone in distress’; ‘eager to make amends after doing something naughty’) to map onto the components of the observed measure. We examined the average of each subscale across the three timepoints assessed. Each analysis controlled for child age, sex, average MDD severity across T1-3, whether or not children met criteria for ODD/CD across T1-3, average anxiety severity across T1-3, and average ADHD severity across T1-3. Table S1 displays that as expected, parents who reported that their children displayed greater levels of guilt, empathy, and prosocial behavior across T1-3 had children who were observed to display lower levels of CU behaviors during the picture tearing task at T3.

|  |  |  |
| --- | --- | --- |
| **Table S1.**  |  |  |
| **Validity of observed CU behavior measure in the current sample (*N*=189)** |
|  | **B** | **S.E.** | ***t*** | ***p*** |
| **T3 Observed CU behaviors** |  |  |  |  |
| Intercept | 1.85 | .47 | 3.93 | <.001 |
| Female Sex | -.16 | .08 | -2.02 | .05 |
| T3 Age | .15 | .05 | 3.01 | .003 |
| T1-3 ODD/CD diagnosis | -.08 | .10 | -.77 | .44 |
| T1-3 ADHD severity | -.004 | .01 | -.25 | .80 |
| T1-3 Anxiety severity | .07 | .03 | 2.61 | .01 |
| T1-3 Depression severity | -1.36 | .74 | -1.84 | .07 |
| **T1-3 Guilt, empathy, prosocial behavior** | **-.17** | **.08** | **-2.20** | **.029** |

**Results**

|  |
| --- |
| **Table S2.** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Whether or Not Children Tore the Photo *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD/ODD (T4-10)** |  |  |  |  |  |  |  |
| Intercept | -3.58 | 1.60 | 5.02 | .03 |  |  |  |
| Male sex | .29 | .19 | 2.39 | .12 |  | 1.78 | .86-3.68 |
| T3 Age | .30 | .24 | 1.53 | .22 |  | 1.35 | .84-2.17 |
| T3 Income-to-needs  | -.04 | .17 | .04 | .84 |  | .97 | .69-1.35 |
| T1-3 ADHD severity | .05 | .05 | .88 | .35 |  | 1.05 | .95-1.17 |
| T1-3 Anxiety severity | .18 | .10 | 3.14 | .08 |  | 1.20 | .98-1.47 |
| PO-MDD diagnosis | .07 | .21 | .13 | .72 |  | 1.16 | .51-2.66 |
| T1-3 ODD/CD diagnosis | .98 | .20 | 23.67 | <.0001 |  | 7.10 | 3.22-15.65 |
| **Picture tearer vs. Non-tearer** | **.40** | **.24** | **2.95** | **.09** | **.27** | **2.24** | **.89-5.63** |
| **DV: ODD T4-10** |  |  |  |  |  |  |  |
| Intercept | -2.74 | 1.58 | 3.00 | .08 |  |  |  |
| Male sex | .18 | .19 | .87 | .35 |  | 1.42 | .68-2.97 |
| T3 Age | .15 | .24 | .36 | .55 |  | 1.16 | .72-1.86 |
| T3 income-to-needs | .03 | .18 | .02 | .88 |  | 1.03 | .73-1.45 |
| T1-3 ADHD severity | .08 | .05 | 2.34 | .13 |  | 1.08 | .98-1.20 |
| T1-3 Anxiety severity | .13 | .10 | 1.57 | .21 |  | 1.14 | .93-1.39 |
| PO-MDD diagnosis | .30 | .21 | 2.13 | .14 |  | 1.84 | .81-4.16 |
| T1-3 ODD diagnosis | .79 | .20 | 15.43 | <.0001 |  | 4.83 | 2.20-10.61 |
| **Picture tearer vs. Non-tearer** | **.31** | **.24** | **1.70** | **.19** | **.29** | **1.87** | **.73-4.81** |

|  |
| --- |
| **Table S2 (continued).** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Whether or Not Children Tore the Photo *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD T4-T10** |  |  |  |  |  |  |  |
| Intercept | -5.09 | 2.23 | 5.20 | .02 |  |  |  |
| Male sex | .30 | .27 | 1.19 | .28 |  | 1.80 | .62-5.21 |
| T3 age | .46 | .33 | 1.92 | .17 |  | 1.58 | .83-3.03 |
| T3 income-to-needs | -.52 | .25 | 4.51 | .03 |  | .59 | .37-.96 |
| T1-3 ADHD severity | .10 | .07 | 2.36 | .12 |  | 1.11 | .97-1.26 |
| T1-3 Anxiety severity | .34 | .13 | 6.99 | .008 |  | 1.40 | 1.09-1.80 |
| PO-MDD diagnosis | -.07 | .29 | .06 | .81 |  | .87 | .28-2.74 |
| T1-3 CD diagnosis | 1.17 | .25 | 21.44 | <.0001 |  | 10.34 | 3.85-27.80 |
| **Picture tearer vs. Non-tearer** | **.37** | **.35** | **1.13** | **.29** | **.29** | **2.11** | **.53-8.38** |

|  |
| --- |
| **Table S3.****Multinomial Logistic Regression Models of Concurrent ODD/CD Diagnoses by Observed CU****Behaviors (*N*=170)** |
|  | **B** | **SE** | **Wald** | ***p*** | ***FDR p*** | **Exp (B)** | ***95% CI for Exp (B)*** |
| **DV: T3 CD/ODD** |  |  |  |  |  |  |  |
| Intercept | -5.53 | 2.18 | 6.41 | .01 |  |  |  |
| Female sex | -.18 | .27 | .44 | .51 |  | .70 | .25-1.99 |
| T3 Age | .09 | .31 | .08 | .78 |  | 1.9 | .59-2.02 |
| T3 Income-to-needs ratio | .17 | .23 | .54 | .46 |  | 1.18 | .76-1.85 |
| T1-3 ADHD severity | .28 | .07 | 13.93 | .0002 |  | 1.32 | 1.14-1.52 |
| T1-3 Anxiety severity | -.04 | .14 | .09 | .76 |  | .96 | .73-1.26 |
| PO-MDD diagnosis | .39 | .28 | 2.01 | .16 |  | 2.19 | .74-6.47 |
| T1-2 ODD/CD diagnosis | .90 | .29 | 9.86 | .002 |  | 6.02 | 1.96-18.44 |
| **T3 CU behaviors** | **1.14** | **.50** | **5.11** | **.024** | **.07** | **3.13** | **1.16-8.40** |
| **DV: T3 ODD** |  |  |  |  |  |  |  |
| Intercept | -5.25 | 2.30 | 5.23 | .02 |  |  |  |
| Female sex | .14 | .30 | .21 | .65 |  | 1.31 | .41-4.23 |
| T3 Age | -.01 | .35 | .00 | .98 |  | .99 | .50-1.96 |
| T3 income-to-needs | .23 | .25 | .83 | .36 |  | 1.26 | .77-2.07 |
| T1-3 ADHD severity | .27 | .08 | 11.45 | .0007 |  | 1.31 | 1.12-1.54 |
| T1-3 Anxiety severity | .18 | .14 | 1.71 | .19 |  | 1.20 | .91-1.58 |
| PO-MDD diagnosis | .33 | .29 | 1.31 | .25 |  | 1.95 | .62-6.12 |
| T1-2 ODD diagnosis | .34 | .32 | 1.14 | .28 |  | 1.99 | .57-6.99 |
| **T3 CU behaviors** | **.76** | **.53** | **2.06** | **.15** | **.15** | **2.14** | **.76-6.05** |
| **DV: T3 CD** |  |  |  |  |  |  |  |
| Intercept | -2.83 | 2.55 | 1.23 | .27 |  |  |  |
| Female sex | -.44 | .33 | 1.72 | .19 |  | .42 | .11-1.54 |
| T3 age | -.33 | .38 | .78 | .38 |  | .72 | .34-1.50 |
| T3 income-to-needs | .16 | .30 | .27 | .60 |  | 1.17 | .65-2.10 |
| T1-3 ADHD severity | .22 | .08 | 6.76 | .009 |  | 1.25 | 1.06-1.47 |
| T1-3 Anxiety severity | -.27 | .22 | 1.54 | .21 |  | .76 | .50-1.17 |
| PO-MDD diagnosis | .36 | .36 | 1.02 | .31 |  | 2.05 | .51-8.23 |
| T1-2 CD diagnosis | 1.10 | .34 | 10.32 | .001 |  | 8.94 | 2.35-34.02 |
| **T3 CU behaviors** | **1.17** | **.68** | **2.99** | **.08** | **.13** | **3.23** | **.86-12.16** |

**Table S4.**

**Multinomial Logistic Regression Model of Subsequent ODD/CD diagnoses by Observed CU Behaviors in Subjects with Early-Starting Conduct Problems (*n*=63a)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Estimate** |  **SE** |  **χ 2** |  ***p*** |
| Intercept | -3.7727 | 2.7495 | 1.88 | 0.1700 |
| Female sex | -0.0422 | 0.3326 | 0.02 | 0.8991 |
| T3 age | -0.0083 | 0.4419 | 0.00 | 0.9850 |
| T3 income-to-needs  | -0.1119 | 0.2781 | 0.16 | 0.6875 |
| T1-T3 ADHD severity | 0.1052 | 0.0806 | 1.71 | 0.1915 |
| T1-T3 anxiety severity | 0.0896 | 0.1828 | 0.24 | 0.6239 |
| PO-MDD diagnosis | 0.3240 | 0.3542 | 0.84 | 0.3603 |
| **T3 Observed CU behaviors** | **2.1039** | **0.6666** | **9.96** | **0.0016** |

aOf the 68 children in the sample with early-starting conduct problems, *n*=5 did not have outcome data. 

**Figure S2. ROC Curve of Subsequent ODD/CD Diagnoses by CU Behaviors Sum Score in Tearers (*N*=170)**

|  |
| --- |
| **Table S5.****Multinomial Logistic Regression Models of Non-Conduct Disorder Diagnoses by Observed CU Behaviors (*N*=170)** |
|  | **B** | **SE** | **Wald** | **p** | **FDR p** | **Exp (B)** | ***95% CI for Exp (B)*** |
| **DV: ADHD (T4-10)** |  |  |  |  |  |  |  |
| Intercept | -2.87 | 1.77 | 2.65 | .10 |  |  |  |
| Female sex | -.34 | .22 | 2.42 | .12 |  | .51 | .22-1.19 |
| T3 Age | .28 | .26 | 1.13 | .29 |  | 1.32 | .79-2.21 |
| T3 icome-to-needs  | .01 | .19 | .00 | .95 |  | 1.01 | .69-1.47 |
| T1-3 ODD/CD severity | .31 | .11 | 8.72 | .003 |  | 1.37 | 1.11-1.68 |
| T1-3 Anxiety severity | .01 | .13 | .00 | .95 |  | 1.01 | .78-1.29 |
| PO-MDD diagnosis | .10 | .24 | .19 | .66 |  | 1.23 | .49-3.10 |
| T1-3 ADHD diagnosis | .48 | .24 | 3.89 | .049 |  | 2.60 | 1.01-6.72 |
| **T3 CU behaviors** | **-.47** | **.38** | **1.49** | **.22** | **.22** | **.63** | **.30-1.33** |
| **DV: MDD T4-10** |  |  |  |  |  |  |  |
| Intercept | -3.64 | 1.55 | 5.48 | .019 |  |  |  |
| Female sex | .16 | .18 | .78 | .38 |  | 1.38 | .68-2.83 |
| T3 Age | .19 | .23 | .68 | .41 |  | 1.21 | .77-1.88 |
| T3 income-to-needs | -.07 | .17 | .18 | .67 |  | .93 | .67-1.29 |
| T1-3 Externalizing severity | .22 | .05 | 19.64 | <.0001 |  | 1.24 | 1.13-1.37 |
| T1-3 Anxiety severity | .03 | .11 | .07 | .79 |  | 1.03 | .84-1.26 |
| PO-MDD diagnosis | .02 | .21 | .01 | .93 |  | 1.04 | .45-2.39 |
| **T3 CU behaviors** | **.58** | **.34** | **2.91** | **.09** | **.13** | **1.79** | **.92-3.47** |
| **DV: Anxiety T4-T10**  |  |  |  |  |  |  |  |
| Intercept | -3.08 | 1.44 | 4.56 | .033 |  |  |  |
| Female sex | .37 | .17 | 4.51 | .034 |  | 2.09 | 1.06-4.11 |
| T3 age | .24 | .21 | 1.31 | .25 |  | 1.28 | .84-1.93 |
| T3 income-to-needs | .14 | .16 | .74 | .39 |  | 1.15 | .84-1.57 |
| T1-3 Externalizing severity | .04 | .04 | 1.48 | .22 |  | 1.04 | .97-1.12 |
| T1-3 Anxiety diagnosis | .51 | .35 | 2.16 | .14 |  | 1.67 | .84-3.30 |
| PO-MDD diagnosis | .31 | .19 | 2.53 | .11 |  | 1.85 | .87-3.96 |
| **T3 CU behaviors** | **.58** | **.33** | **3.17** | **.08** | **.13** | **1.79** | **.94-3.39** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| **Table S6.** |  |  |
| **Multilevel Models of Observed CU Behaviors Predicting Subsequent Non-Conduct Disorder Symptom Severity *(N*=170*)*** |
|  | **B** | **S.E.** | ***t*** | ***p*** | ***FDR p***  |
| **MDD (N=175)** |  |  |  |  |  |
| Intercept | -.34 | .81 | -.43 | .67 |  |
| Age | -.12 | .02 | -5.09 | <.0001 |  |
| Female Sex | .16 | .19 | .85 | .40 |  |
| T3 Age | .43 | .12 | 3.49 | .001 |  |
| T3 Income-to-needs | -.05 | .09 | -.61 | .54 |  |
| T1-3 ODD/CD severity | .16 | .05 | 2.94 | .004 |  |
| T1-3 ADHD severity | .10 | .03 | 2.75 | .007 |  |
| T1-3 Anxiety severity | .09 | .06 | 1.58 | .12 |  |
| PO-MDD diagnosis | .22 | .23 | .98 | .33 |  |
| **T3 Observed CU behaviors** | **.27** | **.18** | **1.51** | **.13** | **.20** |
| **ADHD (N=170)** |  |  |  |  |  |
| Intercept | 2.77 | 1.52 | 1.82 | .07 |  |
| Age | -.45 | .08 | -5.97 | <.0001 |  |
| Female Sex | -.45 | .35 | -1.30 | .20 |  |
| T3 Age | .26 | .23 | 1.13 | .26 |  |
| T3 Income-to-needs | .19 | .16 | 1.17 | .25 |  |
| T1-3 ODD/CD severity | .18 | .10 | 1.88 | .06 |  |
| T1-3 ADHD severity | .50 | .06 | 7.88 | <.0001 |  |
| T1-3 Anxiety severity | .25 | .11 | 2.23 | .03 |  |
| PO-MDD diagnosis | -.22 | .42 | -.53 | .60 |  |
| **T3 Observed CU behaviors** | **.19** | **.33** | **.57** | **.57** | **.57** |
| **Anxiety (N=171)** |  |  |  |  |  |
| Intercept | .08 | .72 | .11 | .91 |  |
| Age | -.12 | .04 | -3.44 | .001 |  |
| Female Sex | .51 | .17 | 3.10 | .002 |  |
| T3 Age | .12 | .11 | 1.06 | .29 |  |
| T3 Income-to-needs | -.03 | .08 | -.45 | .66 |  |
| T1-3 ODD/CD severity | .02 | .05 | .49 | .62 |  |
| T1-3 ADHD severity | .06 | .03 | 1.85 | .07 |  |
| T1-3 Anxiety severity | .17 | .05 | 3.30 | .001 |  |
| PO-MDD diagnosis | -.04 | .20 | -.23 | .82 |  |
| **T3 Observed CU behaviors** | **.33** | **.15** | **2.14** | **.03** | **.10** |

|  |
| --- |
| **Table S7.****Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors in Picture Tearers and Non-Tearers*****(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD/ODD (T4-10)** |  |  |  |  |  |  |  |
| Intercept | -4.46 | 1.71 | 6.75 | .009 |  |  |  |
| Male sex | .17 | .20 | .71 | .40 |  | 1.40 | .64-3.04 |
| T3 Age | .17 | .26 | .45 | .50 |  | 1.19 | .72-1.98 |
| T3 Income-to-needs  | .05 | .18 | .07 | .80 |  | 1.05 | .74-1.49 |
| T1-3 ADHD severity | .05 | .06 | .75 | .39 |  | 1.05 | .94-1.18 |
| T1-3 Anxiety severity | .21 | .11 | 3.63 | .06 |  | 1.23 | .99-1.52 |
| PO-MDD diagnosis | .18 | .23 | .61 | .43 |  | 1.42 | .59-3.44 |
| T1-3 ODD/CD diagnosis | 1.12 | .22 | 24.96 | <.0001 |  | 9.44 | 3.91-22.78 |
| **T3 Observed CU behaviors** | **1.21** | **.29** | **17.62** | **<.0001** | **.0002** | **3.34** | **1.90-5.86** |
| **DV: ODD T4-10** |  |  |  |  |  |  |  |
| Intercept | -3.61 | 1.67 | 4.66 | .03 |  |  |  |
| Male sex | .03 | .20 | .02 | .88 |  | 1.06 | .48-2.34 |
| T3 Age | .01 | .25 | .00 | .96 |  | 1.01 | .61-1.67 |
| T3 income-to-needs | .15 | .18 | .65 | .42 |  | 1.16 | .81-1.67 |
| T1-3 ADHD severity | .09 | .06 | 2.41 | .12 |  | 1.09 | .98-1.22 |
| T1-3 Anxiety severity | .14 | .11 | 1.81 | .18 |  | 1.15 | .94-1.42 |
| PO-MDD diagnosis | .45 | .22 | 4.17 | .04 |  | 2.47 | 1.04-5.89 |
| T1-3 ODD diagnosis | .88 | .22 | 16.02 | <.0001 |  | 5.79 | 2.45-13.67 |
| **T3 Observed CU behaviors** | **1.14** | **.30** | **14.83** | **.0001** | **.0002** | **3.14** | **1.75-5.62** |
|  |
| **Table S7 (continued).** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors in Picture Tearers and Non-Tearers*****(N=170)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD T4-T10** |  |  |  |  |  |  |  |
| Intercept | -5.93 | 2.37 | 6.26 | .01 |  |  |  |
| Male sex | .21 | .29 | .54 | .46 |  | 1.53 | .49-4.73 |
| T3 age | .35 | .35 | 1.00 | .32 |  | 1.42 | .72-2.80 |
| T3 income-to-needs | -.53 | .26 | 4.18 | .04 |  | .59 | .35-.98 |
| T1-3 ADHD severity | .12 | .07 | 3.07 | .08 |  | 1.13 | .99-1.30 |
| T1-3 Anxiety severity | .38 | .14 | 7.77 | .005 |  | 1.46 | 1.12-1.90 |
| PO-MDD diagnosis | -.03 | .30 | .01 | .92 |  | .94 | .29-3.02 |
| T1-3 CD diagnosis | 1.16 | .26 | 19.63 | <.0001 |  | 10.10 | 3.63-28.08 |
| **T3 Observed CU behaviors** | **1.06** | **.38** | **7.62** | **.006** | **.0006** | **2.88** | **1.36-6.10** |

|  |  |  |
| --- | --- | --- |
| **Table S8.** |  |  |
| **Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems in Picture Tearers and Non-Tearers (*N*=170)** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **DV: ODD and CD Severity** |  |  |  |  |  |
| Intercept | .51 | .86 | .59 | .55 |  |
| Assessment Wave | -.24 | .04 | -5.69 | <.0001 |  |
| Female Sex | -.01 | .20 | -.04 | .97 |  |
| T3 Age | .24 | .13 | 1.80 | .07 |  |
| T3 Income-to-needs | .02 | .09 | .17 | .86 |  |
| T1-3 ODD/CD severity | .45 | .06 | 7.92 | <.0001 |  |
| T1-3 ADHD severity | .13 | .04 | 3.71 | .0003 |  |
| T1-3 Anxiety severity | .09 | .06 | 1.53 | .13 |  |
| PO-MDD diagnosis | .15 | .24 | .62 | .54 |  |
| **T3 Observed CU behaviors** | **.44** | **.12** | **3.50** | **.0006** | **.002** |
|  |  |  |  |  |  |
| **DV: ODD Severity** |  |  |  |  |  |
| Intercept | .63 | .66 | .96 | .34 |  |
| Assessment Wave | -.18 | .03 | -5.58 | <.0001 |  |
| Female Sex | -.07 | .15 | -.49 | .62 |  |
| T3 Age | .13 | .10 | 1.28 | .20 |  |
| T3 Income-to-needs | .12 | .07 | 1.61 | .11 |  |
| T1-3 ODD/CD severity | .27 | .04 | 6.28 | <.0001 |  |
| T1-3 ADHD severity | .08 | .03 | 3.08 | .002 |  |
| T1-3 Anxiety severity | .04 | .05 | .96 | .34 |  |
| PO-MDD diagnosis | .27 | .18 | 1.48 | .14 |  |
| **T3 Observed CU behaviors** | **.30** | **.10** | **3.09** | **.002** | **.004** |
|  |  |  |  |  |  |
| **DV: CD Severity** |  |  |  |  |  |
| Intercept | -.21 | .36 | -.58 | .57 |  |
| Assessment Wave | -.06 | .02 | -3.31 | .001 |  |
| Female Sex | .06 | .08 | .79 | .43 |  |
| T3 Age | .12 | .06 | 2.11 | .04 |  |
| T3 Income-to-needs | -.10 | .04 | -2.53 | .01 |  |
| T1-3 ODD/CD severity | .18 | .02 | 7.61 | <.0001 |  |
| T1-3 ADHD severity | .04 | .01 | 2.86 | .005 |  |
| T1-3 Anxiety severity | .05 | .03 | 1.90 | .06 |  |
| PO-MDD diagnosis | -.12 | .10 | -1.22 | .22 |  |
| **T3 Observed CU behaviors** | **.14** | **.05** | **2.60** | **.01** | **.01** |

|  |  |  |
| --- | --- | --- |
| **Table S8.** |  |  |
| **Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use in Picture Tearers and Non-Tearers (*n*=72)** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **Substance use onset** |  |  |  |  |  |
| Intercept | 13.95 | 1.20 | 11.65 | <.0001 |  |
| Female sex | .02 | .28 | .07 | .95 |  |
| T3 age | .50 | .16 | 3.11 | .003 |  |
| T3 income-to-needs | .04 | .12 | .30 | .76 |  |
| T1-3 ODD/CD severity | -.12 | .08 | -1.56 | .12 |  |
| T1-3 ADHD | -.01 | .04 | -.23 | .82 |  |
| T1-3 anxiety severity | -.03 | .08 | -.37 | .71 |  |
| PO-MDD diagnosis | .08 | .31 | .27 | .79 |  |
| **T3 Observed CU behaviors** | **-.35** | **.17** | **-2.00** | **.049** | **.049** |

|  |
| --- |
| **Table S9.** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Age as a Moderator *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD/ODD (T4-10)** |  |  |  |  |  |  |  |
| Intercept | 2.51 | 7.97 | .10 | .75 |  |  |  |
| Male sex | -.04 | .23 | .03 | .86 |  | .92 | .38-2.24 |
| T3 Age | -1.14 | 1.27 | .81 | .37 |  |  |  |
| T3 Income-to-needs  | -.04 | .20 | .04 | .83 |  | .96 | .64-1.43 |
| T1-3 ADHD severity | .08 | .07 | 1.49 | .22 |  | 1.09 | .95-1.24 |
| T1-3 Anxiety severity | .10 | .13 | .55 | .46 |  | 1.11 | .85-1.44 |
| PO-MDD diagnosis | .16 | .25 | .41 | .52 |  | 1.39 | .51-3.76 |
| T1-3 ODD/CD diagnosis | 1.12 | .26 | 18.21 | <.0001 |  | 9.41 | 3.36-26.34 |
| T3 Observed CU behaviors | -2.35 | 4.24 | .31 | .58 |  |  |  |
| **T3 Observed CU behaviors X Age** | **.68** | **.67** | **1.06** | **.30** | **.45** |  |  |
| **DV: ODD T4-10** |  |  |  |  |  |  |  |
| Intercept | -3.98 | 7.92 | .25 | .62 |  |  |  |
| Male sex | -.19 | .24 | .65 | .42 |  | .68 | .27-1.73 |
| T3 Age | -.24 | 1.24 | .04 | .85 |  |  |  |
| T3 income-to-needs | .16 | .22 | .58 | .45 |  | 1.18 | .77-1.80 |
| T1-3 ADHD severity | .11 | .07 | 2.37 | .12 |  | 1.11 | .97-1.28 |
| T1-3 Anxiety severity | .01 | .14 | .01 | .92 |  | 1.01 | .78-1.33 |
| PO-MDD diagnosis | .50 | .26 | 3.63 | .06 |  | 2.72 | .97-7.62 |
| T1-3 ODD diagnosis | 1.06 | .27 | 14.96 | .0001 |  | 8.36 | 2.85-24.51 |
| T3 Observed CU behaviors | 1.80 | 4.14 | .19 | .66 |  |  |  |
| **T3 Observed CU behaviors X Age** | **.07** | **.64** | **.01** | **.91** | **.91** |  |  |
|  |
| **Table S9 (continued).** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Age as a Moderator *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD T4-T10** |  |  |  |  |  |  |  |
| Intercept | 9.50 | 11.27 | .71 | .40 |  |  |  |
| Male sex | .17 | .31 | .31 | .58 |  | 1.41 | .42-4.74 |
| T3 age | -2.23 | 1.80 | 1.54 | .22 |  |  |  |
| T3 income-to-needs | -.58 | .29 | 4.16 | .04 |  | .56 | .32-.98 |
| T1-3 ADHD severity | .12 | .08 | 2.47 | .12 |  | 1.13 | .97-1.31 |
| T1-3 Anxiety severity | .26 | .16 | 2.73 | .10 |  | 1.30 | .95-1.78 |
| PO-MDD diagnosis | .01 | .32 | .00 | .97 |  | 1.02 | .29-3.55 |
| T1-3 CD diagnosis | 1.16 | .30 | 15.42 | <.0001 |  | 10.18 | 3.20-32.41 |
| T3 Observed CU behaviors | -6.82 | 5.96 | 1.31 | .25 |  |  |  |
| **T3 Observed CU behaviors X Age** | **1.33** | **.93** | **2.04** | **.15** | **.45** |  |  |

|  |
| --- |
| **Table S10.** **Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Sex as a Moderator *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD/ODD (T4-10)** |  |  |  |  |  |  |  |
| Intercept | -5.59 | 1.99 | 7.92 | .005 |  |  |  |
| Male sex | .16 | .86 | .04 | .85 |  |  |  |
| T3 Age | .14 | .29 | .23 | .63 |  | 1.15 | .66-2.01 |
| T3 Income-to-needs  | -.02 | .21 | .01 | .92 |  | .98 | .65-1.47 |
| T1-3 ADHD severity | .08 | .07 | 1.30 | .25 |  | 1.08 | .95-1.23 |
| T1-3 Anxiety severity | .09 | .13 | .44 | .51 |  | 1.09 | .84-1.42 |
| PO-MDD diagnosis | .18 | .26 | .49 | .48 |  | 1.43 | .53-3.89 |
| T1-3 ODD/CD diagnosis | 1.13 | .26 | 18.53 | <.0001 |  | 9.54 | 3.42-26.63 |
| T3 Observed CU behaviors | 2.04 | .48 | 17.67 | <.0001 |  |  |  |
| **T3 Observed CU behaviors X Male** | **-.10** | **.46** | **.05** | **.82** | **.82** |  |  |
| **DV: ODD T4-10** |  |  |  |  |  |  |  |
| Intercept | -4.75 | 2.02 | 5.52 | .019 |  |  |  |
| Male sex | -.48 | .90 | .29 | .59 |  |  |  |
| T3 Age | -.11 | .29 | .14 | .71 |  | .90 | .50-1.60 |
| T3 income-to-needs | .15 | .22 | .47 | .49 |  | 1.16 | .76-1.79 |
| T1-3 ADHD severity | .10 | .07 | 2.30 | .13 |  | 1.11 | .97-1.27 |
| T1-3 Anxiety severity | .01 | .14 | .00 | .96 |  | 1.01 | .77-1.32 |
| PO-MDD diagnosis | .49 | .26 | 3.49 | .06 |  | 2.68 | .95-7.56 |
| T1-3 ODD diagnosis | 1.08 | .28 | 15.18 | <.0001 |  | 8.63 | 2.92-25.53 |
| T3 Observed CU behaviors | 2.25 | .1 | 19.25 | <.0001 |  |  |  |
| **T3 Observed CU behaviors X Male** | **.16** | **.47** | **.11** | **.74** | **.82** |  |  |
|  |
| **Table S10 (continued).****Logistic Regression Models of Subsequent ODD/CD Diagnoses by Observed CU Behaviors with Sex as a Moderator *(N*=170*)*** |
|  | B | SE | Wald | *p* | *FDR p* | Exp (B) | *95% CI for Exp (B)* |
| **DV: CD T4-T10** |  |  |  |  |  |  |  |
| Intercept | -7.43 | 2.74 | 7.38 | .007 |  |  |  |
| Male sex | 1.57 | 1.47 | 1.13 | .29 |  |  |  |
| T3 age | .31 | .37 | .71 | .40 |  | 1.36 | .66-2.80 |
| T3 income-to-needs | -.55 | .29 | 3.72 | .05 |  | .57 | .33-1.01 |
| T1-3 ADHD severity | .12 | .08 | 2.60 | .11 |  | 1.13 | .97-1.32 |
| T1-3 Anxiety severity | .26 | .16 | 2.70 | .10 |  | 1.30 | .95-1.78 |
| PO-MDD diagnosis | .11 | .32 | .11 | .74 |  | 1.24 | .36-4.30 |
| T1-3 CD diagnosis | 1.09 | .29 | 14.46 | .0001 |  | 8.86 | 2.88-27.25 |
| T3 Observed CU behaviors | 2.11 | .76 | 7.65 | .006 |  |  |  |
| **T3 Observed CU behaviors X Male** | **-.74** | **.75** | **.98** | **.32** | **.82** |  |  |

|  |  |  |
| --- | --- | --- |
| **Table S11.** |  |  |
| **Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems with Age as a Moderator *(N*=170*)*** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **DV: ODD and CD Severity** |  |  |  |  |  |
| Intercept | .90 | 2.76 | .33 | .74 |  |
| Assessment Wave | -.25 | .05 | -5.13 | <.0001 |  |
| Female Sex | .26 | .22 | 1.17 | .24 |  |
| T3 Age | .01 | .43 | .02 | .99 |  |
| T3 Income-to-needs | .04 | .10 | .38 | .71 |  |
| T1-3 ODD/CD severity | .45 | .06 | 7.49 | <.0001 |  |
| T1-3 ADHD severity | .12 | .04 | 3.07 | .003 |  |
| T1-3 Anxiety severity | .04 | .07 | .56 | .57 |  |
| PO-MDD diagnosis | .27 | .26 | 1.06 | .29 |  |
| T3 Observed CU behaviors | .20 | 1.58 | .12 | .90 |  |
| **T3 Observed CU behaviors X Age** | **.12** | **.24** | **.51** | **.61** | **.89** |
| **DV: ODD Severity** |  |  |  |  |  |
| Intercept | .14 | 2.04 | .07 | .95 |  |
| Assessment Wave | -.18 | .04 | -5.18 | <.0001 |  |
| Female Sex | .06 | .16 | .39 | .70 |  |
| T3 Age | .08 | .32 | .24 | .81 |  |
| T3 Income-to-needs | .14 | .07 | 1.90 | .06 |  |
| T1-3 ODD/CD severity | .27 | .04 | 6.05 | <.0001 |  |
| T1-3 ADHD severity | .08 | .03 | 2.70 | .008 |  |
| T1-3 Anxiety severity | -.02 | .05 | -.30 | .76 |  |
| PO-MDD diagnosis | .38 | .19 | 1.98 | .049 |  |
| T3 Observed CU behaviors | .91 | 1.17 | .78 | .44 |  |
| **T3 Observed CU behaviors X Age** | **-.02** | **.18** | **-.14** | **.89** | **.89** |
| **DV: CD Severity** |  |  |  |  |  |
| Intercept | .83 | 1.21 | .68 | .49 |  |
| Assessment Wave | -.06 | .02 | -2.87 | .005 |  |
| Female Sex | .21 | .10 | 2.14 | .03 |  |
| T3 Age | -.09 | .19 | -.46 | .65 |  |
| T3 Income-to-needs | -.10 | .04 | -2.28 | .02 |  |
| T1-3 ODD/CD severity | .19 | .03 | 7.06 | <.0001 |  |
| T1-3 ADHD severity | .04 | .02 | 2.24 | .03 |  |
| T1-3 Anxiety severity | .05 | .03 | 1.76 | .08 |  |
| PO-MDD diagnosis | -.11 | .11 | -.93 | .35 |  |
| T3 Observed CU behaviors | -.81 | .70 | -1.17 | .24 |  |
| **T3 Observed CU behaviors X Age** | **.16** | **.11** | **1.53** | **.13** | **.39** |

|  |  |  |
| --- | --- | --- |
| **Table S12.** |  |  |
| **Multilevel Models of Observed CU Behaviors Predicting the Severity of Conduct Problems with Sex as a Moderator *(N*=170*)*** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **DV: ODD and CD Severity** |  |  |  |  |  |
| Intercept | -.20 | .96 | -.21 | .83 |  |
| Assessment Wave | -.25 | .05 | -5.12 | <.0001 |  |
| Female Sex | -.49 | .73 | -.68 | .50 |  |
| T3 Age | .23 | .15 | 1.58 | .12 |  |
| T3 Income-to-needs | .06 | .10 | .63 | .53 |  |
| T1-3 ODD/CD severity | .46 | .06 | 7.55 | <.0001 |  |
| T1-3 ADHD severity | .12 | .04 | 3.08 | .003 |  |
| T1-3 Anxiety severity | .04 | .07 | .63 | .53 |  |
| PO-MDD diagnosis | .31 | .26 | 1.18 | .24 |  |
| T3 Observed CU behaviors | .78 | .29 | 2.67 | .008 |  |
| **T3 Observed CU behaviors X Female** | **.43** | **.41** | **1.05** | **.29** | **.44** |
| **DV: ODD Severity** |  |  |  |  |  |
| Intercept | .44 | .72 | .62 | .54 |  |
| Assessment Wave | -.18 | .04 | -5.17 | <.0001 |  |
| Female Sex | -.09 | .55 | -.16 | .87 |  |
| T3 Age | .04 | .11 | .37 | .71 |  |
| T3 Income-to-needs | .15 | .08 | 1.92 | .06 |  |
| T1-3 ODD/CD severity | .27 | .04 | 6.06 | <.0001 |  |
| T1-3 ADHD severity | .08 | .03 | 2.72 | .007 |  |
| T1-3 Anxiety severity | -.01 | .05 | -.27 | .79 |  |
| PO-MDD diagnosis | .39 | .20 | 2.02 | .046 |  |
| T3 Observed CU behaviors | .71 | .22 | 3.26 | .001 |  |
| **T3 Observed CU behaviors X Female** | **.09** | **.31** | **.29** | **.77** | **.77** |
| **DV: CD Severity** |  |  |  |  |  |
| Intercept | -.73 | .42 | -1.73 | .09 |  |
| Assessment Wave | -.06 | .02 | -2.86 | .005 |  |
| Female Sex | -.42 | .32 | -1.32 | .19 |  |
| T3 Age | .20 | .06 | 3.12 | .002 |  |
| T3 Income-to-needs | -.08 | .05 | -1.74 | .08 |  |
| T1-3 ODD/CD severity | .19 | .03 | 7.16 | <.0001 |  |
| T1-3 ADHD severity | .04 | .02 | 2.21 | .03 |  |
| T1-3 Anxiety severity | .06 | .03 | 1.86 | .06 |  |
| PO-MDD diagnosis | -.08 | .12 | -.70 | .48 |  |
| T3 Observed CU behaviors | .06 | .13 | .49 | .63 |  |
| **T3 Observed CU behaviors X Female** | **.36** | **.18** | **1.99** | **.048** | **.14** |

|  |
| --- |
| **Table S13.** **Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use with Age as a Moderator *(N*=170*)*** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **DV: Substance use onset** |  |  |  |  |  |
| Intercept | 15.08 | 4.28 | 3.53 | .001 |  |
| Female sex | -.33 | .36 | -.91 | .37 |  |
| T3 age | .46 | .64 | .72 | .47 |  |
| T3 income-to-needs | .06 | .16 | .36 | .72 |  |
| T1-3 ODD/CD severity | -.13 | .09 | -1.47 | .15 |  |
| T1-3 ADHD | -.02 | .05 | -.30 | .76 |  |
| T1-3 anxiety severity | .01 | .11 | .08 | .94 |  |
| PO-MDD diagnosis | -.05 | .37 | -.14 | .89 |  |
| T3 Observed CU behaviors | -.57 | 2.39 | -.24 | .81 |  |
| **T3 Observed CU behaviors X Age** | **-.02** | **.35** | **-.05** | **.96** | **.96** |

|  |
| --- |
| **Table S14.** **Multiple Regression Model of Observed CU Behaviors Predicting the Age of Onset of Substance Use with Sex as a Moderator *(n*=72*)*** |
|  | B | S.E. | *t* | *p* | *FDR p*  |
| **DV: Substance use onset** |  |  |  |  |  |
| Intercept | 14.86 | 1.82 | 8.14 | <.0001 |  |
| Female sex | .29 | 1.32 | .22 | .83 |  |
| T3 age | .43 | .20 | 2.15 | .04 |  |
| T3 income-to-needs | .04 | .16 | .26 | .79 |  |
| T1-3 ODD/CD severity | -.13 | .09 | -1.43 | .16 |  |
| T1-3 ADHD | -.02 | .05 | -.35 | .73 |  |
| T1-3 anxiety severity | .01 | .10 | .07 | .94 |  |
| PO-MDD diagnosis | -.09 | .38 | -.23 | .82 |  |
| T3 Observed CU behaviors | -.47 | .56 | -.83 | .41 |  |
| **T3 Observed CU behaviors X Sex** | **-.33** | **.69** | **-.48** | **.63** | **.63** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S15.** |  |  |  |  |  |
| **Multilevel Models of Subcomponents of CU Behaviors Scale Predicting Subsequent ODD and CD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **A: Model including low empathy as a predictor** |  |  |  |  |  |
| Intercept | .06 | .85 | .07 | .95 |  |
| Age | -.15 | .05 | -3.30 | .001 |  |
| Female Sex | .16 | .20 | .81 | .42 |  |
| T3 Age | .10 | .13 | .79 | .43 |  |
| T3 Income-to-needs | .02 | .09 | .24 | .81 |  |
| T1-3 externalizing severity | .35 | .02 | 16.12 | <.0001 |  |
| T1-3 internalizing severity | .02 | .06 | .34 | .73 |  |
| PO-MDD diagnosis | .08 | .24 | .35 | .73 |  |
| *Low Empathy* | *.45* | *.12* | *3.65* | *.0004* | *.002* |
| **B: Model including low guilt as a predictor** |  |  |  |  |  |
| Intercept | .22 | .88 | .25 | .80 |  |
| Age | -.17 | .05 | -3.52 | .001 |  |
| Female Sex | .23 | .21 | 1.09 | .28 |  |
| T3 Age | .14 | .14 | 1.01 | .31 |  |
| T3 Income-to-needs | .06 | .10 | .64 | .52 |  |
| T1-3 externalizing severity | .35 | .02 | 15.62 | <.0001 |  |
| T1-3 internalizing severity | .05 | .06 | .79 | .43 |  |
| PO-MDD diagnosis | -.03 | .24 | -.14 | .89 |  |
| *Low Guilt* | *.24* | *.12* | *1.93* | *.06* | *.07* |
| **C: Model including low prosociality as a predictor** |  |  |  |  |  |
| Intercept | .14 | .84 | .17 | .87 |  |
| Age | -.16 | .05 | -3.42 | .001 |  |
| Female Sex | .26 | .20 | 1.30 | .20 |  |
| T3 Age | .06 | .13 | .45 | .65 |  |
| T3 Income-to-needs | .05 | .09 | .51 | .61 |  |
| T1-3 externalizing severity | .34 | .02 | 15.85 | <.0001 |  |
| T1-3 internalizing severity | .04 | .06 | .57 | .57 |  |
| PO-MDD diagnosis | .06 | .23 | .24 | .81 |  |
| *Low Prosociality* | *.44* | *.11* | *3.96* | *.0001* | *.001* |
| **D: Model including active disregard as a predictor** |  |  |  |  |  |
| Intercept | .28 | .86 | .32 | .75 |  |
| Age | -.16 | .05 | -3.45 | .001 |  |
| Female Sex | .07 | .20 | .35 | .72 |  |
| T3 Age | .15 | .13 | 1.10 | .27 |  |
| T3 Income-to-needs | .03 | .09 | .36 | .72 |  |
| T1-3 externalizing severity | .34 | .02 | 15.27 | <.0001 |  |
| T1-3 internalizing severity | .04 | .06 | .67 | .50 |  |
| PO-MDD diagnosis | -.06 | .24 | -.24 | .81 |  |
| *Active Disregard* | *.32* | *.12* | *2.66* | *.009* | *.01* |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Table S15 (continued).****Multilevel Models of Subcomponents of CU Behaviors Scale Predicting Subsequent ODD and CD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **E: Model including low empathy, guilt, and prosociality and active disregard as predictors** |  |  |  |  |  |
| Intercept | -.30 | .84 | -.36 | .72 |  |
| Age | -.16 | .05 | -3.40 | .001 |  |
| Female Sex | .23 | .20 | 1.18 | .24 |  |
| T3 Age | .04 | .13 | .29 | .77 |  |
| T3 Income-to-needs | .04 | .09 | .47 | .64 |  |
| T1-3 externalizing severity | .34 | .02 | 15.99 | <.0001 |  |
| T1-3 internalizing severity | .02 | .06 | .31 | .76 |  |
| PO-MDD diagnosis | .16 | .23 | .69 | .49 |  |
| *Low Empathy* | *.34* | *.13* | *2.68* | *.008* | .01 |
| *Low Guilt* | *.03* | *.13* | *.20* | *.84* | .84 |
| *Low Prosociality* | *.32* | *.12* | *2.68* | *.008* | *.01* |
| *Active Disregard* | *.19* | *.12* | *1.66* | *.10* | *.11* |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S16** |  |  |  |  |  |
| **Multilevel Models of Subcomponents of CU Behaviors Scale Predicting Subsequent ODD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **A: Model including low empathy as a predictor** |  |  |  |  |  |
| Intercept | .74 | .63 | 1.17 | .25 |  |
| Age | -.12 | .03 | -3.60 | .001 |  |
| Female Sex | .01 | .15 | .10 | .92 |  |
| T3 Age | -.02 | .10 | -.24 | .81 |  |
| T3 Income-to-needs | .13 | .07 | 1.92 | .06 |  |
| T1-3 externalizing severity | .22 | .02 | 13.86 | <.0001 |  |
| T1-3 internalizing severity | -.03 | .05 | -.72 | .47 |  |
| PO-MDD diagnosis | .24 | .18 | 1.35 | .18 |  |
| *Low Empathy* | *.32* | *.09* | *3.53* | *.001* | *.002* |
| **B: Model including low guilt as a predictor** |  |  |  |  |  |
| Intercept | .92 | .66 | 1.40 | .16 |  |
| Age | -.13 | .03 | -3.76 | .0003 |  |
| Female Sex | .04 | .16 | .26 | .80 |  |
| T3 Age | .00 | .10 | .03 | .98 |  |
| T3 Income-to-needs | .15 | .07 | 2.14 | .03 |  |
| T1-3 externalizing severity | .22 | .02 | 13.40 | <.0001 |  |
| T1-3 internalizing severity | -.01 | .05 | -.28 | .78 |  |
| PO-MDD diagnosis | .15 | .18 | .82 | .42 |  |
| *Low Guilt* | *.12* | *.09* | *1.34* | *.18* | *.21* |
| **C: Model including low prosociality as a predictor** |  |  |  |  |  |
| Intercept | .76 | .62 | 1.22 | .22 |  |
| Age | -.13 | .03 | -3.72 | .0004 |  |
| Female Sex | .10 | .15 | .67 | .50 |  |
| T3 Age | -.06 | .10 | -.64 | .52 |  |
| T3 Income-to-needs | .15 | .07 | 2.24 | .03 |  |
| T1-3 externalizing severity | .22 | .02 | 13.71 | <.0001 |  |
| T1-3 internalizing severity | -.02 | .05 | -.52 | .60 |  |
| PO-MDD diagnosis | .23 | .17 | 1.33 | .19 |  |
| *Low Prosociality* | *.35* | *.08* | *4.29* | *<.0001* | *<.0001* |
| **D: Model including active disregard as a predictor** |  |  |  |  |  |
| Intercept | .84 | .63 | 1.33 | .19 |  |
| Age | -.13 | .03 | -3.75 | .0003 |  |
| Female Sex | -.06 | .15 | -39 | .69 |  |
| T3 Age | .01 | .10 | .06 | .95 |  |
| T3 Income-to-needs | .14 | .07 | 2.04 | .04 |  |
| T1-3 externalizing severity | .21 | .02 | 13.15 | <.0001 |  |
| T1-3 internalizing severity | -.02 | .05 | -.37 | .71 |  |
| PO-MDD diagnosis | .14 | .17 | .81 | .42 |  |
| *Active Disregard* | *.30* | *.09* | *3.38* | *.001* | *.002* |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Table S16 (continued).** **Multilevel Models of Subcomponents of CU Behaviors Scale Predicting Subsequent ODD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **E: Model including low empathy, guilt, and prosociality and active disregard as predictors** |  |  |  |  |  |
| Intercept | .47 | .61 | .76 | .45 |  |
| Age | -.13 | .03 | -3.65 | .0004 |  |
| Female Sex | .05 | .15 | .33 | .74 |  |
| T3 Age | -.08 | .10 | -.79 | .43 |  |
| T3 Income-to-needs | .14 | .07 | 2.11 | .04 |  |
| T1-3 externalizing severity | .21 | .02 | 13.78 | <.0001 |  |
| T1-3 internalizing severity | -.04 | .04 | -.84 | .40 |  |
| PO-MDD diagnosis | .29 | .17 | 1.74 | .08 |  |
| *Low Empathy* | *.24* | *.09* | *2.62* | *.01* | *.02* |
| *Low Guilt* | *-.05* | *.09* | *-.51* | *.61* | *.61* |
| *Low Prosociality* | *.28* | *.09* | *3.15* | *.002* | *.004* |
| *Active Disregard* | *.20* | *.09* | *2.34* | *.02* | *.03* |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S17.** |  |  |  |  |  |
| **Multilevel Models of Subcomponents of CU Behaviors Scale Predicting Subsequent CD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **A: Model including low empathy as a predictor** |  |  |  |  |  |
| Intercept | -.72 | .40 | -1.81 | .07 |  |
| Age | -.03 | .02 | -1.45 | .15 |  |
| Female Sex | .15 | .09 | 1.67 | .10 |  |
| T3 Age | .13 | .06 | 2.14 | .03 |  |
| T3 Income-to-needs | -.11 | .04 | -2.51 | .01 |  |
| T1-3 externalizing severity | .12 | .01 | 12.19 | <.0001 |  |
| T1-3 internalizing severity | .06 | .03 | 1.91 | .06 |  |
| PO-MDD diagnosis  | -.15 | .11 | -1.35 | .18 |  |
| *Low Empathy* | *.13* | *.06* | *2.24* | *.03* | *.19* |
| **B: Model including low guilt as a predictor** |  |  |  |  |  |
| Intercept |  |  |  |  |  |
| Age | -.73 | .40 | -1.81 | .07 |  |
| Female Sex | -.04 | .02 | -1.66 | .10 |  |
| T3 Age | .19 | .10 | 2.01 | .047 |  |
| T3 Income-to-needs | .14 | .06 | 2.22 | .03 |  |
| T1-3 externalizing severity | -.09 | .04 | -2.07 | .04 |  |
| T1-3 internalizing severity | .12 | .01 | 12.07 | <.0001 |  |
| PO-MDD diagnosis  | .07 | .03 | 2.21 | .03 |  |
| *Low Guilt* | -.18 | .11 | -1.59 | .11 |  |
| **C: Model including low prosociality as a predictor** | *.11* | *.06* | *2.00* | *.048* | *.19* |
| Intercept | -.66 | .40 | -1.65 | .10 |  |
| Age | -.03 | .02 | -1.53 | .13 |  |
| Female Sex | .17 | .09 | 1.79 | .08 |  |
| T3 Age | .13 | .06 | 2.02 | .04 |  |
| T3 Income-to-needs | -.10 | .04 | -2.37 | .02 |  |
| T1-3 externalizing severity | .12 | .01 | 11.94 | <.0001 |  |
| T1-3 internalizing severity | .06 | .03 | 2.06 | .04 |  |
| PO-MDD diagnosis | -.17 | .11 | -1.52 | .13 |  |
| *Low Prosociality* | *.09* | *.05* | *1.68* | *.09* | *.19* |
| **D: Model including active disregard as a predictor** |  |  |  |  |  |
| Intercept | -.60 | .40 | -1.49 | .14 |  |
| Age | -.03 | .02 | -1.52 | .13 |  |
| Female Sex | .14 | .09 | 1.47 | .14 |  |
| T3 Age | .15 | .06 | 2.35 | .02 |  |
| T3 Income-to-needs | -.10 | .04 | -2.41 | .02 |  |
| T1-3 externalizing severity | .12 | .01 | 11.83 | <.0001 |  |
| T1-3 internalizing severity | .06 | .03 | 2.11 | .04 |  |
| PO-MDD diagnosis | -.20 | .11 | -1.76 | .08 |  |
| *Active Disregard* | *.02* | *.06* | *.35* | *.73* | *.83* |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Table S17 (continued).** **Multilevel Models of Subcomponents of CU Behaviors Scale Predicting CD Symptom Severity (*N*=170)** |
|  | **B** | **S.E.** | **t** | ***p*** | ***FDR p*** |
| **E: Model including low empathy, guilt, and prosociality and active disregard as predictors** |  |  |  |  |  |
| Intercept | -.82 | .41 | -2.01 | .046 |  |
| Age | -.03 | .02 | -1.58 | .12 |  |
| Female Sex | .20 | .10 | 2.07 | .04 |  |
| T3 Age | .12 | .06 | 1.90 | .06 |  |
| T3 Income-to-needs | -.10 | .04 | -2.21 | .03 |  |
| T1-3 externalizing severity | .12 | .01 | 11.98 | <.0001 |  |
| T1-3 internalizing severity | .06 | .03 | 1.95 | .05 |  |
| PO-MDD diagnosis | -.13 | .11 | -1.19 | .24 |  |
| *Low Empathy* | *.10* | *.06* | *1.67* | *.10* | *.19* |
| *Low Guilt* | *.07* | *.06* | *1.16* | *.25* | *.40* |
| *Low Prosociality* | *.05* | *.06* | *.78* | *.44* | *.58* |
| *Active Disregard* | *-.01* | *.06* | *-.14* | *.89* | *.89* |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S18.** |  |  |  |  |  |
| **Multiple Regression Models of Subcomponents of CU Behaviors Scale Predicting Age of Substance Use Onset (*n*=72)** |
|  | **B** | **S.E.** | **β** | **t** | ***p*** |
| **A: Model including low empathy as a predictor** |  |  |  |  |  |
| Intercept | 14.19 | 1.50 | .00 | 9.44 | <.0001 |
| Female Sex | -.07 | .33 | -.03 | -.21 | .83 |
| T3 Age | .45 | .20 | .27 | 2.25 | .028 |
| T3 Income-to-needs | .10 | .15 | .08 | .64 | .53 |
| T1-3 externalizing severity | -.06 | .03 | -.25 | -1.86 | .07 |
| T1-3 internalizing severity | -.04 | .10 | -.05 | -.36 | .72 |
| PO-MDD diagnosis | .02 | .38 | .01 | .05 | .96 |
| *Low Empathy* | -.30 | .20 | -.18 | -1.51 | .14 |
|  |  |  |  |  |  |
| **B: Model including low guilt as a predictor** |  |  |  |  |  |
| Intercept | 13.76 | 1.51 | .00 | 9.09 | <.0001 |
| Female Sex | -.09 | .36 | -.03 | -.26 | .80 |
| T3 Age | .47 | .20 | .28 | 2.31 | .024 |
| T3 Income-to-needs | .10 | .16 | .08 | .66 | .51 |
| T1-3 externalizing severity | -.05 | .03 | -.24 | -1.81 | .07 |
| T1-3 internalizing severity | -.05 | .10 | -.06 | -.48 | .63 |
| PO-MDD diagnosis | .16 | .37 | .06 | .44 | .66 |
| *Low Guilt* | -.15 | .20 | -.09 | -.73 | .47 |
|  |  |  |  |  |  |
| **C: Model including low prosociality as a predictor** |  |  |  |  |  |
| Intercept | 14.38 | 1.49 | .00 | 9.64 | <.0001 |
| Female Sex | -.29 | .36 | -.11 | -.79 | .43 |
| T3 Age | .50 | .20 | .29 | 2.50 | .015 |
| T3 Income-to-needs | .10 | .15 | .08 | .63 | .53 |
| T1-3 externalizing severity | -.06 | .03 | -.24 | -1.87 | .07 |
| T1-3 internalizing severity | -.05 | .10 | -.07 | -.51 | .61 |
| PO-MDD diagnosis | .03 | .37 | .01 | .09 | .93 |
| *Low Prosociality* | -.39 | .21 | -.24 | -1.87 | .07 |
|  |  |  |  |  |  |
| **D: Model including active disregard as a predictor** |  |  |  |  |  |
| Intercept | 13.99 | 1.47 | .00 | 9.53 | <.0001 |
| Female Sex | -.05 | .33 | -.02 | -.16 | .87 |
| T3 Age | .47 | .20 | .27 | 2.32 | .024 |
| T3 Income-to-needs | .09 | .15 | .07 | .60 | .55 |
| T1-3 externalizing severity | -.05 | .03 | -.24 | -1.81 | .08 |
| T1-3 internalizing severity | -.03 | .10 | -.04 | -.29 | .77 |
| PO-MDD diagnosis | .11 | .37 | .04 | .31 | .76 |
| *Active Disregard* | -.30 | .20 | -.17 | -1.45 | .15 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Table S18 (continued).****Multiple Regression Models of Subcomponents of CU Behaviors Scale Predicting Age of Substance Use Onset (*n*=72)** |
|  | **B** | **S.E.** | **β** | **t** | ***p*** |
| **E: Model including low empathy, guilt, and prosociality and active disregard as predictors** |  |  |  |  |  |
| Intercept | 15.12 | 1.61 | .00 | 9.37 | <.0001 |
| Female Sex | -.31 | .38 | -.12 | -.81 | .42 |
| T3 Age | .46 | .20 | .27 | 2.30 | .025 |
| T3 Income-to-needs | .06 | .16 | .05 | .39 | .70 |
| T1-3 externalizing severity | -.06 | .03 | -.25 | -1.87 | .07 |
| T1-3 internalizing severity | -.02 | .10 | -.03 | -.25 | .81 |
| PO-MDD diagnosis | -.08 | .38 | -.03 | -.20 | .84 |
| *Low Empathy* | -.20 | .22 | -.12 | -.91 | .37 |
| *Low Guilt* | -.05 | .21 | -.03 | -.22 | .83 |
| *Low Prosociality* | -.25 | .23 | -.16 | -1.11 | .27 |
| *Active Disregard* | -.21 | .21 | -.12 | -1.00 | .32 |