**Supplementary Material**

**Supplement 1**

Supplementary Table 1:

*Attrition analysis: Comparison of the current sample (ERABIS) with the original sample utilising data available at age 6 years*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Romanian adoptees (NIR excluded) | | | |  | UK adoptees | | | |
| Domain | N  (org/ERABIS) | All  (SD) | ERABIS  Mean  (SD) | Trimmed Mean  Difference  (95% CI) | Tγ, ξ | N  (org/ERABIS) | All  (SD) | ERABIS  Mean  (SD) | Trimmed Mean  Difference  (95% CI) | Tγ, ξ |
| Deprivation duration in months | 144/ 70 | 16.25  (11.38) | 15.89  (10.89) | .91  (-4.01; 5.83) | .35, .04 | NA | NA | NA | NA | NA |
| IQ | 134/ 67 | 89.37  (21.21) | 91.74  (19.35) | -5.32  (-13.12; 2.48) | -1.38, .18 | 52/ 23 | 105.29  (17.81) | 103.70  (21.60) | -.55  (-13.54; 12.43) | -.09, .04 |
| ADHD symptoms | 137/ 69 | .75  (.58) | .76  (.57) | -.04  (-.27; .19) | -.31, .03 | 51/ 23 | .50  (.48) | .53  (.52) | -.02  (-.33; .29) | -.15, .04 |
| ASD symptoms | 135/ 68 | 2.66  (2.27) | 2.29  (1.84) | .51  (-.28; 1.31) | 1.28, .18 | 50/ 23 | 1.81  (1.97) | 1.57  (2.06) | .80  (-.34; 1.93) | 1.40, .28 |

CI: confidence interval; IQ: intelligent quotient; \* p< .05, \*\* p< .01;

Tγ: Robust comparison of means via the Yuen-Welch method with bootstrapped confidence intervals (Wilcox, 2016), ξ: robust exploratory measure of effect size, ξ= .15 (small effect), ξ= .35 (moderate effect), ξ= .50 (large effect) (Wilcox, 2016), ERABIS: English and Romanian Adoptees Brain Imaging Study, NIR: never institutionalised Romanians (n=11 in ERABIS sample), NA: not applicable,

org: original ERA sample

Supplementary Figure 1:

*Attrition analysis (Romanian adoptees only)*



Age of placement in months

ADHD symptoms

IQ Score

ASD symptoms

ERABIS: English and Romanian Adoptees Brain Imaging Study

Please note that Romanian adoptees without a history of deprivation have been removed from this figure (n= 21 in original sample)

A picture containing text, crossword puzzle

Description automatically generatedSupplementary Figure 2: Scatter plots of neuropsychological performance and duration of deprivation for Romanian adoptees who took part in the current follow-up.

**Supplement 2: Risky-choice task**

Supplementary Table 2:

*Probabilities, comparison trials and expected values of the eight experimental trials of the risky choice task.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Trial type | Risky Choice Wheel | | Control Choice Wheel | | Expected value |
|  | win/ probability | loss/ probability | win/ probability | loss/ probability |  |
| 1 | .25/+20 | .75/-80 | .50/+10 | .50/-10 | -55 |
| 2 | .25/+80 | .75/-80 | .50/+10 | .50/-10 | -40 |
| 3 | .25/+20 | .75/-20 | .50/+10 | .50/-10 | -10 |
| 4 | .75/+20 | .25/-80 | .50/+10 | .50/-10 | -5 |
| 5 | .25/+80 | .75/-20 | .50/+10 | .50/-10 | 5 |
| 6 | .75/+20 | .25/-20 | .50/+10 | .50/-10 | 10 |
| 7 | .75/+80 | .25/-80 | .50/+10 | .50/-10 | 40 |
| 8 | .75/+80 | .25/-20 | .50/+10 | .50/-10 | 55 |
|  |  |  |  |  |  |

Figure 3:

*Risky-choice-task*



**-10**

**-10**

**-10**

**-10**

**+10**

**+10**

**+10**

**+10**

**-20**

**-20**

**-20**

**-20**

**-20**

**-20**

**+80**

**+80**



**-20**

**-20**

**-20**

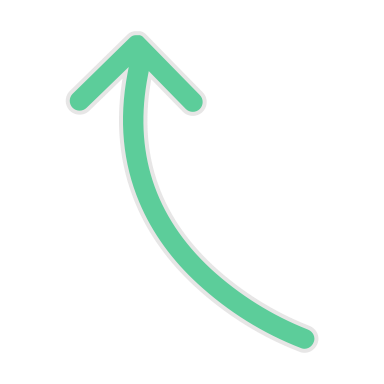
**-20**

**-20**

**-20**

**+80**

**+80**



**-20**

**-20**

**-20**

**-20**

**-20**

**-20**

**+80**

**+80**



**-10**

**-10**

**-10**

**-10**

**+10**

**+10**

**+10**

**+10**

**-20**

**-20**

**-20**

**-20**

**-20**

**-20**

**+80**

**+80**

**Points:100**

**Points:100**

**Please Choose Now**

**You Win!**

**Points:180**

**0**

**ITI**

**2 sec**

**Decision-making phase**

**Anticipatory phase**

**2 sec**

**Reward sound**

**2 sec**

**No time limit**

**1 sec**

ITI: inter-trial interval

**Supplement 3: Emotion recognition control condition**

Supplementary Table 3: *Identification of non-emotional control faces in the two adoptee groups*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Domain | nUK/nRA | UK  Mean  (SD) | Rom  Mean  (SD) | Trimmed Mean  Difference  (95% CI) | Tγ, ξ |
| Non-emotional faces | 22/64 | 87.22  (13.15) | 82.62  (12.67) | 5.96  (-.38; 12.30) | 1.87, ξ= .33 |

Note: p= .067

CI: confidence interval; Tγ: Robust comparison of means via the Yuen-Welch method with bootstrapped confidence intervals (Wilcox, 2016), ξ: robust exploratory measure of effect size, ξ= .15 (small effect), ξ= .35 (moderate effect), ξ= .50 (large effect) (Wilcox, 2016)

Supplementary Table 4: *Correlations between the amount of correctly identified non-emotional control faces and symptoms of ASD and ADHD (whole group) and duration of deprivation (Romanian adoptees only)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Spearman correlations  (95% bootstrapped and bias corrected confidence interval) | | |  |
|  |  | ADHD | ASD | Deprivation duration (RA only) |
| Non-emotional faces |  | r= -.12  (-.34; .13) | r= -.14  (-.37; .08) | r= -.11  (-.36; .14) |

Note: ADHD: p= .311, ASD: p= .117, Deprivation duration: p= .376

**Supplement 4: Correlations between parent-rated ASD and ADHD symptoms in Romanian adoptees living with their parents and Romanian adoptees living alone/ with their partner**

Supplementary Table 5:

*Spearman correlations between parent-reported ADHD and ASD symptoms and neuropsychological outcomes as a function of whether the Romanian adoptees were still living with their parents. Fisher’s z-tests were used to test for differences in correlation coefficients between adoptees living with their parents and adoptees living on their own or with their partner. Please note that differences in sample size are due to missing data on living situation in the whole sample.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All RA | | RA living with parents | | RA living with partner/ alone | | Test statistic | |
|  | ADHD  (95% CI) | ASD  (95% CI) | ADHD  (95% CI) | ASD  (95% CI) | ADHD  (95% CI) | ASD  (95% CI) | ADHD  (95% CI) | ASD  (95% CI) |
| N (IQ/ PM) | 63/ 62 | 60/ 59 | 23/ 23 | 22/ 22 | 37/ 36 | 35/ 34 |  |  |
| IQ | -.364\*\*o  (-.561; -.127) | -.220  (-.470; .044) | -.259  (-.621; -.282) | -.276  (-.638; .161) | -.362\*  (-.643; -.047) | -.173  (-.513; .202) | z= .41  (-.369; .602) | z= -.38  (-.587; .424) |
| Prospective Memory (PM) | -.259\*  (-.459; -.026) | -.153  (-.415; .129) | -.300  ( -.601;.059) | .227  ( -.205; .627) | -.201  (-.479; .129) | -.302  (-.595; .018) | z= -.37  (-.574; .421) | z= 1.89  (-.022; .982) |

o Significant after FDR correction for multiple comparisons

Spearman correlations with bootstrapped 95% confidence intervals (1000 bootstraps). Correlations with Prospective Memory have been adjusted for IQ.

Fisher’s z-test with 95% confidence intervals.

**Supplement 5: Correlations between self-reported emotional problems and neuropsychological performance**

Dimensional symptom counts for parent-rated and self-rated emotional problems were created for Generalised Anxiety Disorder and Depression by mapping items from the Conner’s Comprehensive Behavior Rating Scale (Conners, 2008) on to DSM-5 (American Psychiatric Association, 2013) symptom domains. Symptom counts for GAD and Depression were then averaged to create an Emotional problems score (see Golm *et al.*, 2020 for details).

Supplementary Table 6: *Spearman correlations with emotional problems (mean score of Emotional Problems Paper score of Generalised Anxiety Disorder and Depression symptoms)*

|  |  |  |
| --- | --- | --- |
|  | Emotional problems  Self-rated  (95% CI) | Emotional problems  Parent-rated  (95% CI) |
| Prospective memory | -.081  (-306; .145) | -.245\*  (-.451; -.010) |
| Proactive inhibition | -.122  (-.339; .132) | -.177  (-.388; .066) |
| Commission errors | .093  (-.150; .337) | -.016  (-.220; .198) |
| Riskprone | -.193  (-.410; .035) | .018  (-.211; .249) |
| Decision Making | -.198  (-.442; .047)) | -.057  (-.280; .154) |
| Facial recognition | -.231\*  (-.444; -.013) | -.158  (-.393; .080) |

\*p< .05, o Significant after FDR correction for multiple comparisons

**Supplement 6: Correlations between neuropsychological outcomes and duration of deprivation**

Supplementary Table 6:

*Spearman correlations between neuropsychological outcomes and duration of deprivation in months (Romanian adoptees only)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | Spearman correlations  (95% bootstrapped and bias corrected confidence interval) | | | | | | |
|  |  | IQ | | Prospective  Memory | Proactive  Inhibition | Commission  Errors | Risk  Proneness | Decision  Making | Emotion Recognition# |
| Duration of deprivation in months |  | r= -.19  (-.44; .08) | | r= .06  (-.18; .30) | r= -.11  (-.37; .18) | r= .001  (-.27; .25) | r= .07  (-.17; .28) | -.18  (-.46; .10) | r= -.06  (-.36; .25) |

\* p< .05, \*\* p< .01; #Emotion recognition is based on the aggregate score across all negative emotions