**Supplement**

**Results**

**Equivalence Testing for Main Effects of Age on Attention Bias**

We conducted equivalence testing using the R package TOSTER, v0.3.4, (Lakens, 2017) in order to determine whether we can reject the hypothesis that there is a meaningfully large linear effect of age on attention bias to emotion (i.e., sad, happy, and angry). In order to conduct equivalence testing, we first determined the smallest effect size we would consider meaningful were we able to reject the null hypothesis that that effect is not zero. We determined that a small effect between *r*= +/- .2 would be considered too small to interpret as meaningful. The TOSTER package performs two one-sided *t*-tests against the negative (i.e., -.2) and positive (i.e., .2) equivalence bounds to determine whether we could reject the presence of an effect large enough to be meaningful. In other words, if we can reject both that the effect is smaller than *r* = .2 and larger than *r* = -.2, we can decide that the effect is practically equivalent to zero.

Equivalence tests examining the linear effects of age predicting attention bias to sad, angry, and happy faces were all significant (*p*s<.028) when equivalence bounds were set at -.2 and .2 with an alpha of .05. This means that we can reject the hypothesis that the true effect is as extreme or more extreme than -.2 and .2. Therefore, we conclude that the true effect of age on attention bias to emotion lies between -.2 and .2.

**Sensitivity Analysis**

We relied on parent-report only for the measurement of externalizing symptoms in very young children ages 4-5 years-old. In order to determine if this measurement difference affected results, we conducted a sensitivity analysis examining age as a moderator between the association of attention bias towards happy faces and externalizing symptoms only in participants ages 6- to 18-years-old who were able to provide a self-report of symptoms.

Results were largely unchanged when limiting our analysis to participants over age 6. Age continued to moderate the association between attention bias towards happy faces and externalizing symptoms (b=1.03, *p*=.03; Supplemental Table 5), such that there was a positive association between attention to happy faces and externalizing symptoms only during late childhood, adolescence and young adulthood at age 9.00 years-old and older, but not during early childhood.

**Supplemental Figure Captions**

Supplemental Figure 1. Distribution of age across the entire sample.

Supplemental Figure 2. Association between depression symptoms and attention bias to angry faces moderated by age. Note. Bolded vertical line indicates Johnson-Neyman region of significance (i.e., effects are significant at age 14.68 and older).

Supplemental Figure 3. Association between anxiety symptoms and attention bias to angry faces moderated by age. Note. Bolded vertical line indicates Johnson-Neyman region of significance (i.e., effects are significant at age 17.75 and older).

Supplemental Figure 4. Association between anxiety symptoms and attention bias to happy faces moderated by age. Note. Bolded vertical line indicates Johnson-Neyman region of significance (i.e., effects are significant at age 10.72 and younger).

Supplemental Figure 5. Association between externalizing symptoms and attention bias to happy faces moderated by age. Note. Bolded vertical line indicates Johnson-Neyman region of significance (i.e., effects are significant at age 9.33 and older).

Supplemental Table 1. *Bivariate correlations*.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Sex | − |  |  |  |  |  |  |
| 2. Age | .02 | − |  |  |  |  |  |
| 3. Attention Bias – Angry | .05 | -.05 | − |  |  |  |  |
| 4. Attention Bias – Happy | -.08 | .06 | -.08 | − |  |  |  |
| 5. Attention Bias – Sad | -.12 | .03 | -.05 | .06 | − |  |  |
| 6. Depression | -.03 | .06 | .05 | .17\* | -.01 | − |  |
| 7. Anxiety | .07 | .03 | .02 | .12 | .02 | .68\*\* | − |
| 8. Externalizing | -.22\* | -.04 | -.15 | .02 | .08 | .43\* | .24\* |

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

Supplemental Table 2. *Age by Attention bias to emotional faces (sad, angry, happy) interaction predicting depression symptoms controlling for sex*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Angry* *Emotion* | |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.10 (0.23) | [-0.36, 0.57] | 0.44 | .66 |
| Age | 0.14(0.09) | [-0.02, 0.31] | 1.66 | .10 |
| Angry Bias | 0.26(0.15) | [-0.02, 0.56] | 1.81 | .07 |
| **Age x Angry Bias** | **0.50(0.19)** | **[0.12, 0.88]** | **2.57** | **.01** |
| Sex | -0.16(0.14) | [-0.40, 0.18] | -0.73 | .49 |
| *Sad Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.06 (0.25) | [-042, 0.55] | 0.26 | .79 |
| Age | 0.03(0.09) | [-0.16, 0.21] | 0.31 | .76 |
| Sad Bias | 0.05(0.15) | [-0.25, 0.36] | 0.35 | .72 |
| Age x Sad Bias | 0.27(0.18) | [1.54, 0.13] | 1.54 | .13 |
| Sex | -0.76(0.15) | [-0.38,0.23] | -0.49 | .62 |
| *Happy Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.11(023) | [-0.35, 0.57] | 0.48 | .64 |
| Age | 0.11(0.09) | [-0.06, 0.28] | 1.24 | .22 |
| Happy Bias | 0.46(0.28) | [-0.10, 1.02] | 1.63 | .10 |
| Age x Happy Bias | -0.28(0.31) | [-0.90, 0.34] | -0.90 | .37 |
| Sex | -0.13(0.15) | [-0.42 0.16] | -0.89 | .37 |

Supplemental Table 3. *Age by Attention bias to emotional faces (sad, angry, happy) interaction predicting anxiety symptoms controlling for sex*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Angry* *Emotion* | |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | -0.16(0.25) | [-0.67, 0.35] | -0.63 | .53 |
| Age | 0.08(0.10) | [-0.12, 0.29] | 0.82 | .41 |
| Angry Bias | 0.15(0.16) | [-0.17, 0.46] | 0.92 | .36 |
| **Age x Angry Bias** | **0.54(.22)** | **[0.11, 0.98]** | **2.47** | **.01** |
| Sex | 0.09(0.16) | [-0.23, 0.41] | 0.57 | .57 |
| *Sad Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | -0.17(0.26) | [-0.68,0.34] | -0.65 | .52 |
| Age | -0.03(0.10) | [-0.23, -0.39] | -0.25 | .80 |
| Sad Bias | 0.04(0.17) | [-0.30, 0.38] | 0.21 | .83 |
| Age x Sad Bias | 0.42(0.22) | [-0.02, 0.86] | 1.89 | .06 |
| Sex | 0.09(0.16) | [-0.23,0.41] | 0.57 | .57 |
| *Happy Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | -0.08(0.26) | [-0.58, 0.43] | -0.30 | .76 |
| Age | 0.02(0.10) | [-0.18, 0.22] | 0.19 | .85 |
| Happy Bias | 0.25(0.31) | [-0.36, 0.86] | 0.81 | .42 |
| **Age x Happy Bias** | **-0.72(0.36)** | **[-1.43, -0.02]** | **-2.03** | **.04** |
| Sex | 0.02(0.16) | [-0.29 0.34] | 0.15 | .88 |

Supplemental Table 4. *Age by Attention bias to emotional faces (sad, angry, happy) interaction predicting externalizing Symptoms controlling for sex*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Angry* *Emotion* | |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.60(0.31) | [-0.01, 1.21] | 1.95 | .05 |
| Age | -0.02(0.14) | [-0.29, 0.24] | -0.18 | .86 |
| Angry Bias | -0.04(0.22) | [-0.47, 0.40] | -0.16 | .87 |
| Age x Angry Bias | -0.13(0.22) | [-0.30, 0.57] | 0.61 | .55 |
| Sex | -0.42(0.19) | [-0.79, -0.05] | -2.26 | .03 |
| *Sad Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.56(0.30) | [-0.04,1.16] | 1.85 | .07 |
| Age | -0.003(0.14) | [-0.28, 0.27] | -0.02 | .98 |
| Sad Bias | 0.13(0.23) | [-0.34, 0.59] | 0.54 | .59 |
| Age x Sad Bias | 0.07(0.21) | [-0.34, 0.48] | 0.33 | .74 |
| Sex | -0.39(0.18) | [-0.76,0.03] | -2.13 | .04 |
| *Happy Emotion* |  |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.75(0.28) | [0.19, 1.31] | 2.66 | .009 |
| Age | -0.02(0.12) | [-0.27, 0.22] | -0.17 | .86 |
| Happy Bias | 1.45 (0.46) | [0.54, 2.35] | 3.16 | .002 |
| **Age x Happy Bias** | **1.20(0.36)** | **[0.49, 1.91]** | **3.36** | **.001** |
| Sex | -0.51(0.17) | [-0.85, -0.17] | -2.98 | .004 |

Supplemental Table 5. *Sensitivity analysis for age by attention bias to happy faces predicting externalizing symptoms controlling for sex in participants 6-years-old and older*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Happy* *Emotion* | |  |  |  |
| Predictor | *b (SE b)* | 95% CI | *t* | *p* |
| Intercept | 0.93(0.40) | [0.14, 1.74] | 2.32 | .02 |
| Age | -0.01(0.02) | [-0.06, 0.03] | -0.53 | .59 |
| Happy Bias | -1.16(0.68) | [-2.51, 0.19] | -1.70 | .09 |
| **Age x Happy Bias** | **0.17(0.08)** | **[0.02, 0.33]** | **2.21** | **.03** |
| Sex | -0.51(0.18) | [-0.87, -0.16] | -2.84 | .005 |

