# Supplementary Material

## Results

The results of multiple analyses are presented as supplementary information.

### Anxious Symptoms and Substance Use

Given that anxiety and substance use are highly comorbid with depression and associated with elevated peripheral inflammation, analyses were conducted that examined whether the results observed for depressive symptoms held when models predicted to anxiety symptoms or substance use, rather than depressive symptoms - see Supplementary Table 1 and 2, respectively. For both anxiety symptoms and substance use, overall model fit was good and were similar to indices of model fit reported for the main models with depression. Moreover, significant associations observed in models of depressive symptoms overall, were observed consistently for models of anxious symptoms and substance use, with the exception that no significant associations were observed linking anxious symptoms with any outcome variable, except for a positive association with future orientation. Similarly, no significant associations were observed linking substance use with any outcome variable, except for a positive association with switching attention.

### Analyses examining Tumor Necrosis Factor-Alpha (TNF-α), C-Reactive Protein (CRP), interleukin-8 (IL-8), and IL-10

Supplementary Tables 3 – 6 present the models reported in the main manuscript with the following inflammatory biomarkers iteratively substituted for IL-6: TNF-α, CRP, IL-8, and IL-10. Based on these analyses, model fit was good for TNF-α, IL-8, and IL-10; however, model fit was inadequate for CRP, and thus, parameters estimated should not be interpreted. Results indicate that effects observed for IL-6 were attenuated substantially for TNF-α, IL-8, and IL-10 and were present only at non-significant or trending levels. In the case of TNF-α, a non-significant negative association was observed between concurrent TNF-α and selective attention and switching attention while a significant negative association was observed for future orientation. No significant prospective associations were observed for TNF-α predicting to future measures of cognitive functioning: however, higher levels of TNF-α were significantly associated with increased future depressive symptoms.

For IL-8, trend level negative associations were observed between concurrent IL-8 and switching attention (accuracy) as well as future orientation. However, a trend-level positive association also was observed for selective attention. No significant prospective associations were observed for IL-8 predicting to future depressive symptoms; however, a trend level association was observed between higher levels of IL-8 and lower future switching attention (timing).

Finally, associations between concurrent IL-10 and measures of cognitive functioning all were attenuated to a level of non-significance. No significant associations between IL-10 and future executive functioning or depressive symptoms occurred, with the exception of switching attention (accuracy), where increased IL-10 predicted worse future switching attention (accuracy).

## *Differences Based on Sex or Race*

Supplementary Tables 7 and 8 provide information on the main analyses when conducted separately for i) males and females and ii) those identifying as Caucasians and African-Americans/Biracial. Given that the sample size for each of these analyses is approximately halved, extreme caution should be exercised in interpreting parameter estimates, given the decreased power of these analyses.

*Confounding Variables*

There are multiple bio-behavioral factors that are known to systematically influence levels of inflammatory biomarkers, including sex, race, age, adiposity, socio-economic status, substance use, medication use, medical diagnoses that influence immune system activation, circadian rhythms, phase of menstrual cycle, physical fitness/activity, and food intake (O'Connor *et al.*, 2009). The current study attempted to control for important variables, where possible, either statistically (e.g., BMI) or through exclusion (e.g., acute infection as indicated by CRP values > 10 mg/L; medical diagnoses). However, it is important to note that analyses presented in the main manuscript did not control for all known confounds (e.g., sex, SES, medication status) because the addition of each control variable to the model introduces, at least, an additional 12 parameters, which potentially would fatally undermine the reliability of the parameters being estimated. Instead, the study has sought to balance model complexity with statistical reliability.

In this section, we have further investigated the association between a range of control variables and study outcomes in order to identify the most crucial variables to control for. Supplementary Table 9 replicated the correlation table presented in the main manuscript, but included an additional five variables assessing anxiety symptoms, substance use, days since last menses, medication status, and time of day when blood was drawn.

## New Measures Introduced For Sensitivity Analyses

Anxious Symptoms: The Multidimensional Anxiety Scale for Children (MASC) is a 39-item self report questionnaire that assessed symptoms of anxiety in children and adolescents, using questions such as ‘I feel tense or uptight’. Each item is a 4-point likert scale that ranges from “Never” to “Often”. The MASC is a reliable and valid measure of anxious symptoms in a community sample of adolescents (March *et al.*, 1997, March *et al.*, 1999).

*Substance Use*: The Adolescent Alcohol and Drug Involvement Scale (AADIS) is a face-valid assessment of how often adolescents use alcohol and twelve other substances (e.g., marijuana, hallucinogens, amphetamines, cocaine) (Moberg, 2003). For each substance, participants indicated in which of the following categories their level of substance use fell: “Never Used,” “Tried Once or Twice,” “Several Times a Month,” Weekends Only,” “Several Times a Week,” “Daily,” or “Several Times a Day.” Each response is assigned a weight ranging from zero (“Never Used”) to seven (“Several Times a Day”). A total score (a sum of each of the 13 items) is computed based across all responses. The measure was adapted from the Adolescent Drug Involvement Scale (Moberg and Hahn, 1991) and is a reliable and valid measure of substance use in adolescents (Moberg, 2003).

*Days Since They Last Experienced Menses*: Female participants were asked how many days had passed since they last experienced menses.

*Medication Status*: Prior to blood draw, participants were asked whether they take any medications. For analytic purposes, a variable was created identifying participants who take any inflammation-altering medications for asthma (e.g., albuterol), stimulants, (e.g., vyvanse), selective serotonin re-uptake inhibitors (e.g., zoloft), selective serotonin and norepinephrine reuptake inhibitors (e.g., lexapro), mood stablilizers and anti-convulsant/psychotic (e.g., lamictal), any form of birth control (e.g., mirena), acne medication (e.g., accutane), and non-steroidal anti-inflammatory medications or painkillers. This was computed as a binary variable and, at baseline, 61 (21.2%) participants were taking some form of medication that modulates immune function.

*Time of Blood Draw*: At baseline, the majority (54.5%) of participants participated in a blood draw during the afternoon (2PM); however, 20.8% of participants had blood drawn in the morning (10AM) and the remainder (24.7%) completed a blood draw in the evening (5PM).

*Sensitivity Analyses*: Associations between potential control variables, demographic variables, and outcome variables are presented in Supplementary Table 9. Due to the danger that the parameter estimates of an overly complex model will be biased, rather than including every possible control variable in the model, control variables were included based on observed associations across multiple outcome variables. The following variables were selected for inclusion in sensitivity analyses: socioeconomic status, race, age, and sex.

The results of these analyses are presented in Supplementary Table 10. Overall, results held, with the exception of an association between concurrent IL-6 and switching attention (accuracy) and a prospective association between depressive symptoms and future IL-6 failing to meet criteria for significance. Some other notable results were that females consistently had higher levels of peripheral IL-6 as well as depressive symptoms, in line with existing research (Au *et al.*, 2015, Eisenberger *et al.*, 2009, Nolen-Hoeksema, 2001), which may account for the absence of an association between IL-6 and depressive symptoms once gender is controlled. Identifying as African-American or biracial was associated with higher levels of IL-6, a finding in line with a previous meta-analysis that found that non-white identification was associated with elevated peripheral inflammation (Nazmi and Victora, 2007). Finally, low socioeconomic status was associated with worse performance on two of four cognitive measures, a finding previously observed in this sample (Mac Giollabhui *et al.*, 2018).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 1. Anxious Symptoms: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 103.43\*\*\* | 114.93\*\*\* | 106.13\*\*\* | 116.67\*\*\* |
| Comparative Fit Index | .94 | .92 | .93 | .92 |
| Root Mean Square Error of Approximation (95% CI) | .07(.05-.08) | .07(.06-.09) | .07(.05-.08) | .07(.06-.09) |
| **Concurrent Associations** | | | | |
| IL6 w/ COG | **-.14\*\*** | .00 | **-.13\*** | **-.13\*** |
| BMI w/ COG | -.06 | -.09 | **-.11\*** | -.02 |
| MASC w/ COG | -.05 | .00 | .03 | **.11\*** |
| BMI w/ MASC | .03 | .00 | .03 | .02 |
| IL6 w/ MASC | .03 | .03 | .03 | .03 |
| IL6 w/ BMI | **.15\*\*\*** | **15\*\*\*** | **.15\*\*\*** | **.15\*\*\*** |
| **Prospective Associations** | | | | |
| IL6 predicting to COG | .09 | -.08 | .02 | -.02 |
| BMI predicting to COG | **-.16\*\*** | -.05 | **-.20\*\*** | -.01 |
| MASC predicting to COG | .09 | -.08 | .04 | .01 |
| BMI predicting to MASC | .05 | .05 | .06 | .05 |
| IL6 predicting to MASC | -.07 | -.07 | -.07 | -.07 |
| COG predicting to MASC | .02 | .04 | .05 | .03 |
| BMI predicting to IL6 | **.33\*\*\*** | **.33\*\*\*** | **.33\*\*\*** | **.33\*\*\*** |
| MASC predicting to IL6 | .07 | .07 | .06 | .07 |
| MASC predicting to BMI | -.01 | -.01 | -.01 | -.01 |
| IL6=Interleukin-6; COG=Cognitive variable of interest; BMI=Body Mass Index; MASC= Multidimensional Anxiety Scale for Children  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 2. Substance Use: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 105.96\*\*\* | 123.06\*\*\* | 101.53\*\*\* | 119.44\*\*\* |
| Comparative Fit Index | .94 | .92 | .94 | .93 |
| Root Mean Square Error of Approximation (95% CI) | .07(.05-.08) | .08(.06-.09) | .06(.05-.08) | .07(.06-.09) |
| **Concurrent Associations** | | | | |
| IL6 w/ COG | **-.13\*\*** | -.02 | **-.12\*** | **-.13\*** |
| BMI w/ COG | -.07 | -.08 | **-.10\*** | -.06 |
| AADIS w/ COG | .02 | -.01 | .02 | .01 |
| BMI w/ AADIS | -.01 | -.02 | -.02 | -.02 |
| IL6 w/ AADIS | -.03 | -.03 | -.03 | -.03 |
| IL6 w/ BMI | **.15\*\*** | **15\*\*** | **.15\*\*** | **.15\*\*** |
| **Prospective Associations** | | | | |
| IL6 predicting to COG | .09 | -.06 | .03 | .00 |
| BMI predicting to COG | **-.16\*\*** | -.06 | **-.20\*\*** | -.02 |
| AADIS predicting to COG | .08 | -.18Ψ | .16 | -.14 |
| BMI predicting to AADIS | -.03 | -.03 | -.03 | -.02 |
| IL6 predicting to AADIS | .01 | .01 | .01 | .01 |
| COG predicting to AADIS | .01 | **.08\*** | .01 | .02 |
| BMI predicting to IL6 | **.32\*\*\*** | **.32\*\*\*** | **.32\*\*\*** | **.32\*\*\*** |
| AADIS predicting to IL6 | -.08 | -.08 | -.09 | .-.09 |
| AADIS predicting to BMI | -.07Ψ | -.07Ψ | -.07Ψ | -.07Ψ |
| IL6=Interleukin-6; COG=Cognitive variable of interest; BMI=Body Mass Index; AADIS= Adolescent Alcohol and Drug Involvement Scale  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 3. Tumor necrosis factor – Alpha: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 100.34\*\*\* | 110.57\*\*\* | 105.53\*\*\* | 110.18\*\*\* |
| Comparative Fit Index | .94 | .93 | .93 | .93 |
| Root Mean Square Error of Approximation (95% CI) | .06(.05-.08) | .07(.05-.09) | .07(.05-.08) | .07(.05-.09) |
| **Concurrent Associations** | | | | |
| TNF w/ COG | -.01 | .04 | -.07 | **-.15\*\*** |
| BMI w/ COG | -.07 | -.09Ψ | -.10Ψ | -.05 |
| CDI w/ COG | -.03 | **-.14\*** | .03 | -.04 |
| BMI w/ CDI | .08Ψ | .08Ψ | .08Ψ | .08Ψ |
| TNF w/ CDI | -.06 | -.06 | -.07 | -.07 |
| TNF w/ BMI | .00 | .00 | .00 | .00 |
| **Prospective Associations** | | | | |
| TNF predicting to COG | -.01 | .01 | -.06 | .06 |
| BMI predicting to COG | **-.13\*** | -.10Ψ | **-.20\*** | -.03 |
| CDI predicting to COG | .01 | -.12Ψ | .03 | -.09 |
| BMI predicting to CDI | **.12\*** | .11Ψ | **.12\*\*** | **.12\*** |
| TNF predicting to CDI | **.09\*** | **.09\*** | **.09\*** | .08Ψ |
| COG predicting to CDI | .06 | -.05 | .06 | -.01 |
| BMI predicting to TNF | .09 | .04 | .05 | .05 |
| CDI predicting to TNF | -.01 | -.01 | -.01 | -.01 |
| CDI predicting to BMI | -.02 | -.02 | -.02 | -.02 |
| TNF=Tumor Necrosis Factor-Alpha; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children’s Depression Inventory  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 4. C-Reactive Protein: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 175.95\*\*\* | 174.50\*\*\* | 174.49\*\*\* | 186.42\*\*\* |
| Comparative Fit Index | .86 | .86 | .86 | .86 |
| Root Mean Square Error of Approximation (95% CI) | .10(.08-.11) | .10(.08-.11) | .10(.08-.11) | .10(.09-.12) |
| **Concurrent Associations** | | | | |
| CRP w/ COG | .02 | -.01 | -.10Ψ | -.02 |
| BMI w/ COG | -.09 | -.09Ψ | **-.11\*** | -.05 |
| CDI w/ COG | -.03 | **-.13\*** | .03 | -.03 |
| BMI w/ CDI | .09Ψ | .08Ψ | .10Ψ | .08Ψ |
| CRP w/ CDI | .03 | .03 | .03 | .02 |
| CRP w/ BMI | **.30\*\*\*** | **30\*\*\*** | **30\*\*\*** | **30\*\*\*** |
| **Prospective Associations** | | | | |
| CRP predicting to COG | .06 | .01 | .04 | -.06 |
| BMI predicting to COG | **-.16\*** | -.10 | **-.20\*\*** | .00 |
| CDI predicting to COG | .01 | -.12Ψ | .03 | -.08 |
| BMI predicting to CDI | **.12\*** | **.11\*** | **.12\*** | **.12\*** |
| CRP predicting to CDI | -.02 | -.07 | -.02 | -.03 |
| COG predicting to CDI | .06 | -.06 | .06 | -.02 |
| BMI predicting to CRP | **.23\*\*\*** | **.23\*\*\*** | **.23\*\*\*** | **.23\*\*\*** |
| CDI predicting to CRP | -.02 | -.02 | -.02 | -.02 |
| CDI predicting to BMI | -.02 | -.02 | -.02 | -.02 |
| CRP=C-Reactive Protein; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children’s Depression Inventory  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 5. Interleukin-8: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 99.15\*\*\* | 107.97\*\*\* | 118.21\*\*\* | 103.88\*\*\* |
| Comparative Fit Index | .94 | .93 | .91 | .93 |
| Root Mean Square Error of Approximation (95% CI) | .06(.05-.08) | .07(.05-.08) | .07(.06-.09) | .07(.05-.08) |
| **Concurrent Associations** | | | | |
| IL8 w/ COG | .09Ψ | .02 | -.09Ψ | -.12Ψ |
| BMI w/ COG | -.07 | -.09Ψ | -.10Ψ | -.03 |
| CDI w/ COG | -.03 | **-.14\*** | .02 | -.03 |
| BMI w/ CDI | .08Ψ | .08Ψ | .07 | .08Ψ |
| IL8 w/ CDI | -.02 | -.01 | -.01 | -.02 |
| IL8 w/ BMI | .01 | .01 | .01 | .01 |
| **Prospective Associations** | | | | |
| IL8 predicting to COG | -.01 | -.10Ψ | .02 | -.01 |
| BMI predicting to COG | **-.13\*** | -.11Ψ | **-.20\*\*** | -.02 |
| CDI predicting to COG | .00 | **-.12\*** | .04 | -.08 |
| BMI predicting to CDI | **.12\*** | **.10\*** | **.12\*** | **.11\*** |
| IL8 predicting to CDI | -.04 | .05 | -.03 | -.03 |
| COG predicting to CDI | .06 | -.06 | .06 | -.02 |
| BMI predicting to IL8 | .01 | .01 | .01 | .01 |
| CDI predicting to IL8 | .05 | .05 | .05 | .05 |
| CDI predicting to BMI | -.02 | -.02 | -.02 | -.02 |
| IL8=Interleukin-8; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children’s Depression Inventory  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 6. Interleukin-10: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 97.35\*\*\* | 111.47\*\*\* | 90.15\*\*\* | 103.87\*\*\* |
| Comparative Fit Index | .94 | .93 | .95 | .94 |
| Root Mean Square Error of Approximation (95% CI) | .06(.04-.08) | .07(.05-.09) | .06(.04-.07) | .07(.05-.08) |
| **Concurrent Associations** | | | | |
| IL10 w/ COG | -.04 | 07. | -.07 | -.09 |
| BMI w/ COG | -.07 | .09 | **-.11\*** | -.05 |
| CDI w/ COG | -.04 | **-.13\*** | .04 | -.02 |
| BMI w/ CDI | .09Ψ | .08Ψ | .08Ψ | .08Ψ |
| IL10 w/ CDI | -.08Ψ | -.07 | -.07 | -.07 |
| IL10 w/ BMI | -.01 | -.01 | -.01 | -.01 |
| **Prospective Associations** | | | | |
| IL10 predicting to COG | -.05 | -.05 | **-.14\*** | .04 |
| BMI predicting to COG | **-.13\*** | -.10Ψ | **-.19\*\*** | -.03 |
| CDI predicting to COG | .00 | -.12Ψ | .04 | -.08 |
| BMI predicting to CDI | **.11\*** | **.10\*** | **.12\*** | **.10\*** |
| IL10 predicting to CDI | .05 | .05 | .05 | .04 |
| COG predicting to CDI | .05 | -.06 | .06 | -.02 |
| BMI predicting to IL10 | -.02 | -.02 | -.02 | -.02 |
| CDI predicting to IL10 | .05 | .05 | .05 | .05 |
| CDI predicting to BMI | -.02 | -.02 | -.02 | -.02 |
| IL10 = Interleukin-10; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children’s Depression Inventory  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Supplementary Table 7. Sex: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | | | | | |
|  | Selective Attention | | Switching Attention (Timing | | Switching Attention (Accuracy) | | Future Orientation | |
|  | Male | Female | Male | Female | Male | Female | Male | Female |
| **Model Fit Indices** |  |  |  |  |  |  |  |  |
| Chi-Squared Test of Model Fit | 170.80\*\*\* | | 186.08\*\*\* | | 185.74\*\*\* | | 183.82\*\*\* | |
| Comparative Fit Index | .92 | | .899 | | .896 | | .91 | |
| Root Mean Square Error of Approximation (95% CI) | .08(.06-.09) | | .08(.07-.10) | | .08(.07-.10) | | . 08(.06-.10) | |
| **Concurrent Associations** | | | | |  |  |  |  |
| IL6 w/ COG | **-.29\*** | **-18\*** | -.12 | .09 | -.12 | -.12 | **-.19\*** | -.06 |
| BMI w/ COG | -.12 | -.06 | -.16 | -.08 | -.05 | **-.16\*** | .08 | .03 |
| CDI w/ COG | -.10 | -.15Ψ | **-.20\*** | -.13 | .07 | .01 | -.03 | -.01 |
| BMI w/ CDI | **.22\*** | .02 | **.22\*** | .03 | **.17\*** | .02 | **.17\*** | .02 |
| IL6 w/ CDI | .00 | -.02 | -.01 | -.01 | .00 | -.02 | .01 | -.02 |
| IL6 w/ BMI | .10 | **19\*\*** | .09 | **.20\*\*** | .10 | **.20\*\*** | .10Ψ | **.20\*\*** |
| **Prospective Associations** | | | | |  |  |  |  |
| IL6 predicting to COG | .04 | .06 | -.07 | .12 | -.03 | .06 | -.05 | .05 |
| BMI predicting to COG | -.06 | **-.25\*\*** | .10 | **-.25\*\*** | **-.35\*\*** | **-.19\*** | -.03 | -.06 |
| CDI predicting to COG | -.13 | .03 | -.03 | .01 | -.05 | .01 | -.07 | **-.13\*** |
| BMI predicting to CDI | .06 | .11Ψ | .05 | **-.25\*\*** | .09 | .11 | .05 | .10Ψ |
| IL6 predicting to CDI | -.01 | .01 | -.02 | .02 | -.01 | .01 | -.01 | .01 |
| COG predicting to CDI | .04 | .04 | .00 | -.11 | .08 | .05 | .05 | -.06 |
| BMI predicting to IL6 | **.33\*\*\*** | **.35\*\*\*** | **.33\*\*\*** | **.35\*\*\*** | **.31\*\*** | **.35\*\*\*** | **.33\*\*\*** | **.35\*\*\*** |
| CDI predicting to IL6 | .04 | .10 | .03 | .10 | .03 | .10 | .04 | .10 |
| CDI predicting to BMI | -.05Ψ | .00 | -.05Ψ | -.01 | -.05Ψ | -.01 | -.05Ψ | .00 |
| IL6=Interleukin-6; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children Depression Inventory  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Supplementary Table 8. Race: Concurrent and Prospective Associations For Each of the Four SEM Models | | | | | | | | |
|  | Selective Attention | | Switching Attention (Timing) | | Switching Attention (Accuracy) | | Future Orientation | |
|  | Cauc | AA | Cauc | AA | Cauc | AA | Cauc | AA |
| **Model Fit Indices** |  |  |  |  |  |  |  |  |
| Chi-Squared Test of Model Fit | 194.33\*\*\* | | 243.38\*\*\* | | 202.97\*\*\* | | 204.58\*\*\* | |
| Comparative Fit Index | .896 | | .85 | | .884 | | .89 | |
| Root Mean Square Error of Approximation (95% CI) | .09(.07-.10) | | .11(.09-.12) | | .09(.07-.11) | | . 09(.07-.11) | |
| **Concurrent Associations** | | | | |  |  |  |  |
| IL6 w/ COG | **-.19\*** | -.11 | -.13 | .13Ψ | **-.25\*** | -.04 | -.01 | **-22\*\*** |
| BMI w/ COG | -.02 | -.06 | .04 | -.14Ψ | -.11 | -.10 | .09 | -.12Ψ |
| CDI w/ COG | -.13 | .02 | **-.20\*** | -.08 | .08 | -.01 | .04 | -.08 |
| BMI w/ CDI | .09 | .08 | .08 | .08 | .30 | .06 | .13 | .09 |
| IL6 w/ CDI | .06 | -.03 | .06 | -.03 | .06 | -.03 | .06 | -.03 |
| IL6 w/ BMI | **.22\*\*** | **11\*** | **.22\*\*** | **12\*** | **.23\*\*** | **11\*** | **.22\*\*** | **12\*** |
| **Prospective Associations** | | | | |  |  |  |  |
| IL6 predicting to COG | .07 | .13 | .00 | -.09 | -.05 | .02 | -.13 | .11 |
| BMI predicting to COG | -.15 | **-.20\*** | .13 | **-.18\*** | -.11 | **-.20\*** | -.02 | -.05 |
| CDI predicting to COG | -.05 | -.01 | **-.26\*** | -.11 | .05 | .02 | -.14Ψ | -.05 |
| BMI predicting to CDI | .04 | **.14\*** | .05 | **.13\*** | .04 | **.15\*** | .04 | **.14\*** |
| IL6 predicting to CDI | .02 | .02 | .02 | .02 | .03 | .01 | .02 | .01 |
| COG predicting to CDI | .00 | .07 | -.04 | -.09 | .06 | .05 | .00 | .01 |
| BMI predicting to IL6 | **.20\*** | **.38\*\*\*** | **.20\*** | **.38\*\*\*** | .20Ψ | **.38\*\*\*** | **.20\*** | **.38\*\*\*** |
| CDI predicting to IL6 | .05 | .12Ψ | .05 | .12Ψ | .05 | .12Ψ | .05 | .12Ψ |
| CDI predicting to BMI | .04 | -.05 | .04 | -.05 | .04 | -.05 | .04 | -.05 |
| IL6=Interleukin-6; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI = Children Depression Inventory; AA = African-American; Cauc = Caucasian  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Supplementary Table 9. Bivariate correlations of study variables for 288 participants at Time 1 with a purpose of identifying control variables | | | | | | | | | | | | | | | | |
| Measure | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1: T1 Age | .01 | .10 | .02 | .08 | .10 | .09 | .07 | .01 | .23\*\* | -.10 | .02 | .22\*\* | -.06 | .15\* | .01 | -.07 |
| 2: Female | - | -.03 | -.01 | .10 | .14\* | .25\*\*\* | -.08 | .09 | .04 | .02 | .17\*\* | -.06 | N/A | .10 | .04 | .04 |
| 3: Race |  | - | .40\*\*\* | .07 | .01 | .11 | .02 | -.04 | -.05 | -.22\*\*\* | -.07 | .00 | -.13 | -.14\* | .11 | .02 |
| 4: Low SES |  |  | - | .02 | .13\* | .06 | .11 | -.11 | -.17\* | -.21\*\* | .08 | -.05 | .06 | -.06 | .12\* | .00 |
| 5: T1 BMI |  |  |  | - | .09 | .33\*\*\* | -.02 | -.07 | -.06 | -.10 | .09 | .00 | .06 | -.04 | .00 | -.08 |
| 6: T1 CDI |  |  |  |  | - | -.01 | -.01 | -.04 | -.09 | .06 | .42\*\*\* | .17\*\* | .06 | .11 | -.01 | -.04 |
| 7: T1 IL6 |  |  |  |  |  | - | -.15\* | -.06 | .12 | -.18\* | .06 | -.09 | .05 | -.02 | -.09 | .14\* |
| 8: T1 FOS |  |  |  |  |  |  | - | -.02 | -.05 | .13 | .12 | -.13 | -.17 | -.03 | .01 | .06 |
| 9: T1 ATT |  |  |  |  |  |  |  | - | .15\* | .17\* | -.03 | -.12 | -.08 | -.08 | .08 | -.02 |
| 10: T1 CCT |  |  |  |  |  |  |  |  | - | .21\*\* | .09 | .20\* | -.17 | -.10 | .01 | .01 |
| 11: T1 CCA |  |  |  |  |  |  |  |  |  | - | -.01 | -.02 | .03 | .10 | -.06 | -.04 |
| 12: MASC |  |  |  |  |  |  |  |  |  |  | - | .14\* | .03 | -.02 | .06 | .02 |
| 13: AADIS |  |  |  |  |  |  |  |  |  |  |  | - | .07 | .00 | .04 | .01 |
| 14: Days M |  |  |  |  |  |  |  |  |  |  |  |  | - | -.12 | -.22\*\* | .05 |
| 15: Med |  |  |  |  |  |  |  |  |  |  |  |  |  | - | -.10 | -.08 |
| 16: Morning Draw |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - | -.29\*\*\* |
| 17: Evening Draw |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| T1 Age=Age at baseline; ; SES=Socioeconomic status; Race: 1=African-American; BMI=Body Mass Index; CDI=Children’s Depression Inventory; FOS =Future Orientation Scale; T1: Time 1; ATT=TEA or TEAch Selective Attention; CCT=TEA or TEAch Switching Attention Timing; CCA=TEA or TEAch Switching Attention Accuracy; MASC= Multidimensional Anxiety Scale for Children; AADIS= Adolescent Alcohol and Drug Involvement Scale; Days M = Days Since Last Menstrual Cycle; Use Of Medications Known To Influence With Immune Functioning; Morning Draw/Evening Draw = Blood Was Drawn In The Morning/Evening Compared to Afternoon and Evening/Morning and Afternoon  Probability \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | | | | | | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplementary Table 10. Concurrent and Prospective Associations For Each of the Four SEM Models including additional control variables, including socioeconomic status, race, age, and sex | | | | |
|  | Selective Attention | Switching Attention (Timing) | Switching Attention (Accuracy) | Future Orientation |
| **Model Fit Indices** |  |  |  |  |
| Chi-Squared Test of Model Fit | 208.32\*\*\* | 225.66\*\*\* | 213.18\*\*\* | 212.31\*\*\* |
| Comparative Fit Index | .94 | .92 | .93 | .93 |
| Root Mean Square Error of Approximation (95% CI) | .06(.04-.07) | .06(.05-.07) | .06(.05-.07) | .06(.05-.07) |
| **Concurrent Associations** | | | | |
| IL6 w/ COG | **-.14\*\*** | .04 | -.07 | **-.17\*\*** |
| BMI w/ COG | -.09 | -.07 | -.06 | -.06 |
| CDI w/ COG | -.05 | **-.16\*\*** | .02 | -.05 |
| BMI w/ CDI | .09Ψ | .08Ψ | .09Ψ | .07Ψ |
| IL6 w/ CDI | -.01 | -.01 | -.01 | -.01 |
| IL6 w/ BMI | **.13\*\*** | **13\*\*** | **13\*\*** | **13\*\*** |
| **Prospective Associations** | | | | |
| IL6 predicting to COG | .09 | -.07 | -.02 | -.01 |
| BMI predicting to COG | **-.14\*** | -.05 | **-.16\*** | -.03 |
| CDI predicting to COG | .01 | -.09 | .07 | -.08 |
| BMI predicting to CDI | .08Ψ | .07 | .09Ψ | .08Ψ |
| IL6 predicting to CDI | .00 | .01 | .00 | -.01 |
| COG predicting to CDI | .04 | -.09 | .05 | -.04 |
| BMI predicting to IL6 | **.29\*\*\*** | **.30\*\*\*** | **.30\*\*\*** | **.30\*\*\*** |
| CDI predicting to IL6 | .06 | .06 | .06 | .06 |
| CDI predicting to BMI | -.03 | -.03 | -.03 | -.03 |
| **Control Variables** | | | | |
| SES predicting to IL6 | -.01 | -.01 | -.01 | -.01 |
| Race predicting to IL6 | **.18\*** | **.19\*** | **.19\*** | **.19\*** |
| Age predicting to IL6 | -.01 | -.02 | -.02 | -.01 |
| Sex predicting to IL6 | **.39\*\*\*** | **.37\*\*\*** | **.37\*\*\*** | **.38\*\*\*** |
| SES predicting to BMI | .01 | .01 | .01 | .01 |
| Race predicting to BMI | .05 | .05 | .06 | .05 |
| Age predicting to BMI | .03 | .03 | .03 | .03 |
| Sex predicting to BMI | .06 | .05 | .05 | .05 |
| SES predicting to CDI | .03 | .01 | .03 | .02 |
| Race predicting to CDI | -.08 | -.09 | -.07 | -.07 |
| Age predicting to CDI | .07Ψ | **.09\*** | .07Ψ | .07Ψ |
| Sex predicting to CDI | **.17\*** | **.16\*** | **.16\*** | **.17\*** |
| SES predicting to COG | **-.29\*\*** | **-.22\*** | -.18 | .00 |
| Race predicting to COG | .02 | -.12 | **-.26\*** | .11 |
| IL6=Interleukin-6; COG=Cognitive variable of interest; BMI=Body Mass Index; CDI=Children’s Depression Inventory; SES = Socioeconomic Status; Race (Race: 1=African-American/Biracial);  Probability: Ψ=*p*<.10; \*=*p*<.05; *\*\**= *p*<.01; *\*\*\**= *p*<.001 | | | | |

**References**

**Au, B., Smith, K. J., Gariepy, G. & Schmitz, N.** (2015). The longitudinal associations between C-reactive protein and depressive symptoms: evidence from the English Longitudinal Study of Ageing (ELSA). *International Journal of Geriatric Psychiatry* **30**, 976-84.

**Eisenberger, N. I., Inagaki, T. K., Rameson, L. T., Mashal, N. M. & Irwin, M. R.** (2009). An fMRI study of cytokine-induced depressed mood and social pain: the role of sex differences. *Neuroimage* **47**, 881-890.

**Mac Giollabhui, N., Olino, T. M., Nielsen, J., Abramson, L. Y. & Alloy, L. B.** (2018). Is Worse Attention a Risk Factor for or a Consequence of Depression, or Are Worse Attention and Depression Better Accounted for by Stress? A Prospective Test of Three Hypotheses. *Clinical Psychological Science*, 2167702618794920.

**March, J. S., Parker, J. D., Sullivan, K., Stallings, P. & Conners, C. K.** (1997). The Multidimensional Anxiety Scale for Children (MASC): factor structure, reliability, and validity. *Journal of the American Academy of Child and Adolescent Psychiatry* **36**, 554-65.

**March, J. S., Sullivan, K. & Parker, J.** (1999). Test-retest reliability of the Multidimensional Anxiety Scale for Children. *Journal of Anxiety Disorders* **13**, 349-358.

**Moberg, D. P.** (2003). Screening for alcohol and other drug problems using the Adolescent Alcohol and Drug Involvement Scale (AADIS). *Madison, WI: Center for Health Policy and Program Evaluation, University of Wisconsin-Madison*.

**Moberg, D. P. & Hahn, L.** (1991). The adolescent drug involvement scale. *Journal of Child & Adolescent Substance Abuse* **2**, 75-88.

**Nazmi, A. & Victora, C. G.** (2007). Socioeconomic and racial/ethnic differentials of C-reactive protein levels: a systematic review of population-based studies. *BMC Public Health* **7**, 212.

**Nolen-Hoeksema, S.** (2001). Gender differences in depression. *Current Directions In Psychological Science* **10**, 173-176.

**O'Connor, M. F., Bower, J. E., Cho, H. J., Creswell, J. D., Dimitrov, S., Hamby, M. E., Hoyt, M. A., Martin, J. L., Robles, T. F., Sloan, E. K., Thomas, K. S. & Irwin, M. R.** (2009). To assess, to control, to exclude: effects of biobehavioral factors on circulating inflammatory markers. *Brain Behavior and Immunity* **23**, 887-97.