**Dampened Psychobiological Responses to Stress and Substance Use in Adolescence: Supplemental Materials**

Table S1 provides descriptive statistics for all assessments of salivary cortisol and emotion ratings, which are displayed graphically in Figures S2 and S3. Tables S2-S4 provide pairwise correlations substance use and indices of cortisol and emotion at baseline, reactivity, and recovery. Tables S5-S25 present results of multilevel models predicting cortisol and emotional responses to stress as a function of substance use and time. Specifically, Tables S5-S11 present results as a function of substance use and time; Tables S12-S18 present results as a function of substance use, time, and poverty status; Tables S19-S25 present results as a function of substance use, time, and sex.

Figure S1 is a flowchart showing sample size across assessments since initial recruitment. Figures S2-S3 show changes in salivary cortisol and emotion ratings over time.  
Figure S4 presents the null associations between use of alcohol by age 14 and vaping nicotine by age 16 among youth below the poverty line.

*Table S1.* Descriptive statistics for each time point.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Angry | | Sad | | Happy | |
|  | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Baseline | 0.19 | 0.22 | 1.29 | 1.13 | 1.47 | 1.41 | 6.65 | 2.68 |
| During TSST | — | — | 4.00 | 3.26 | 2.29 | 2.40 | 2.65 | 2.31 |
| 15 Min. Post TSST Onset | 0.17 | 0.22 | 2.50 | 2.57 | 1.93 | 2.00 | 5.03 | 2.99 |
| 30 Min. Post TSST Onset | 0.19 | 0.20 | 1.72 | 1.89 | 1.54 | 1.58 | 6.06 | 3.07 |
| 60 Min. Post TSST Onset | 0.16 | 0.16 | 1.28 | 1.02 | 1.34 | 1.25 | 6.82 | 2.96 |

*Table S2*. Descriptive statistics and correlations between study variables across the full sample.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *M (SD)* | *Min* | *Max* | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |
| 1. Alcohol by 14 | 0.20 (0.40) | 0.00 | 1.00 | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Alcohol by 16 | 0.40 (0.49) | 0.00 | 1.00 | .40c | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Marijuana by 14 | 0.19 (0.39) | 0.00 | 1.00 | .41c | .32c | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Marijuana by 16 | 0.31 (0.46) | 0.00 | 1.00 | .37c | .49c | .46c | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5. Cigarettes by 14 | 0.08 (0.27) | 0.00 | 1.00 | .40c | .21c | .35c | .21c | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6. Cigarettes by 16 | 0.11 (0.32) | 0.00 | 1.00 | .33c | .36c | .19b | .35c | .48c | — |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7. Vaping by 16 | 0.29 (0.46) | 0.00 | 1.00 | .28c | .30c | .20b | .44c | .12a | .34c | — |  |  |  |  |  |  |  |  |  |  |  |  |
| 8. Baseline Cortisol | 0.19 (0.22) | 0.00 | 1.27 | .03 | -.04 | -.05 | .00 | -.04 | -.04 | .00 | — |  |  |  |  |  |  |  |  |  |  |  |
| 9. Baseline Anger | 1.29 (1.13) | 1.00 | 10.00 | .03 | .01 | .00 | -.02 | -.05 | -.05 | .00 | -.02 | — |  |  |  |  |  |  |  |  |  |  |
| 10. Baseline Sadness | 1.47 (1.41) | 1.00 | 10.00 | -.06 | -.04 | .02 | -.11 | -.06 | -.09 | -.06 | .06 | .32c | — |  |  |  |  |  |  |  |  |  |
| 11. Baseline Happiness | 6.65 (2.68) | 1.00 | 10.00 | -.17b | -.12 | -.08 | -.09 | -.03 | -.11 | -.07 | .05 | -.10 | -.11 | — |  |  |  |  |  |  |  |  |
| 12. Cortisol Reactivity | 0.00 (0.25) | -0.90 | 1.24 | -.10 | -.05 | .02 | -.05 | .01 | -.04 | -.14 | -.63c | .03 | .08 | -.02 | — |  |  |  |  |  |  |  |
| 13. Anger Reactivity | 2.64 (3.28) | -8.00 | 9.00 | .01 | .06 | .03 | -.05 | .05 | .02 | .02 | -.06 | -.20b | -.01 | .06 | -.05 | — |  |  |  |  |  |  |
| 14. Sadness Reactivity | 0.81 (2.39) | -7.00 | 9.00 | -.01 | -.04 | -.09 | -.10 | -.08 | -.08 | -.04 | .07 | .03 | -.27c | .11 | -.02 | .31c | — |  |  |  |  |  |
| 15. Happiness Reactivity | -4.00 (3.10) | -9.00 | 6.00 | .17a | .13a | .07 | .08 | .04 | .13 | -.01 | -.02 | .09 | .07 | -.67c | .05 | -.28c | -.20b | — |  |  |  |  |
| 16. Cortisol Recovery | -0.03 (0.25) | -1.23 | 0.84 | .15a | .09 | -.02 | .06 | .03 | .13 | .17a | -.20b | -.06 | -.18b | .01 | -.44c | .05 | -.05 | -.05 | — |  |  |  |
| 17. Anger Recovery | -2.65 (3.10) | -9.00 | 5.00 | .00 | -.03 | -.05 | .05 | -.03 | .01 | -.01 | .06 | -.04 | -.04 | -.05 | .03 | -.93c | -.34c | .28c | -.03 | — |  |  |
| 18. Sadness Recovery | -0.88 (2.40) | -9.00 | 9.00 | -.01 | .02 | .02 | .07 | .08 | .08 | -.01 | -.03 | -.14a | .04 | -.04 | .04 | -.26c | -.86c | .19b | .01 | .33c | — |  |
| 19. Happiness Recovery | 4.09 (3.33) | -7.00 | 9.00 | -.11 | -.10 | -.03 | -.01 | .00 | -.07 | .06 | .05 | .01 | -.04 | .49c | -.01 | .19b | .18b | -.77c | -.02 | -.28c | -.21b | — |

*Note*: a *p*< .05, b *p* < .01, c *p* < .001. Emotion reactivity = Retrospective report of Emotion during Trier Social Stress Test – Baseline report of Emotion. Emotion Recovery = Final report of Emotion - Retrospective report of Emotion during Trier Social Stress Test. Cortisol reactivity = Cortisol 30 min. Post-Trier Social Stress Test Onset – Baseline Cortisol. Cortisol Recovery = Cortisol 60 min. Post-Trier Social Stress Test Onset - Cortisol 30 min. Post-Trier Social Stress Test Onset.

*Table S3*. Descriptive statistics and correlations between study variables for participants below the poverty line (below) and above the poverty line (above).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Below*  *M (SD)* | *Above M (SD)* | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |
| 1. Alcohol by 14 | 0.20 (0.40) | 0.20 (0.4) | — | .50c | .42c | .22a | .48c | .29b | .12 | .34b | -.03 | -.07 | -.05 | -.28a | -.04 | .03 | .14 | -.01 | .08 | -.02 | -.15 |
| 2. Alcohol by 16 | 0.43 (0.50) | 0.39 (0.49) | .36c | — | .34b | .43c | .21 | .17 | .13 | .14 | .02 | -.10 | -.16 | -.17 | .19 | .11 | .08 | -.01 | -.15 | -.10 | -.10 |
| 3. Marijuana by 14 | 0.21 (0.41) | 0.18 (0.38) | .41c | .31c | — | .44c | .37c | .06 | .22a | .04 | -.09 | .03 | -.03 | -.02 | -.01 | -.14 | .10 | -.02 | -.04 | .07 | .04 |
| 4. Marijuana by 16 | 0.35 (0.48) | 0.29 (0.46) | .45c | .52c | .46c | — | .11 | .14 | .30b | .14 | .00 | -.01 | -.12 | -.10 | -.13 | .02 | -.03 | -.11 | .08 | -.08 | .12 |
| 5. Cigarettes by 14 | 0.10 (0.30) | 0.07 (0.25) | .36c | .21b | .34c | .28c | — | .49c | .04 | -.13 | -.09 | -.05 | .05 | -.03 | .14 | -.11 | .02 | .11 | -.08 | .12 | .03 |
| 6. Cigarettes by 16 | 0.08 (0.28) | 0.13 (0.34) | .35c | .45c | .26c | .44c | .50c | — | .16 | .09 | -.08 | -.09 | -.10 | -.16 | .04 | -.06 | .01 | .00 | .06 | .08 | -.07 |
| 7. Vaping by 16 | 0.32 (0.47) | 0.28 (0.45) | .37c | .39c | .19a | .51c | .18a | .42c | — | .20 | .14 | -.10 | .10 | -.31b | -.06 | -.04 | -.15 | .08 | .03 | .02 | .20 |
| 8. Baseline Cortisol | 0.20 (0.23) | 0.18 (0.21) | -.13 | -.15 | -.10 | -.09 | .01 | -.09 | -.12 | — | .07 | -.04 | -.07 | -.67c | -.17 | .00 | .05 | -.08 | .17 | .01 | -.07 |
| 9. Baseline Anger | 1.29 (1.11) | 1.28 (1.14) | .06 | .01 | .05 | -.03 | -.03 | -.04 | -.08 | -.05 | — | .17 | -.01 | -.02 | -.26a | .10 | .05 | -.14 | .10 | -.25a | .12 |
| 10. Baseline Sadness | 1.39 (1.28) | 1.51 (1.48) | -.06 | -.02 | .02 | -.15a | -.06 | -.09 | -.04 | .11 | .39c | — | -.26a | .31 | -.01 | -.30 | .10 | -.43 | .03 | -.04 | .03 |
| 11. Baseline Happiness | 6.63 (2.67) | 6.67 (2.7) | -.23b | -.09 | -.10 | -.07 | -.08 | -.12 | -.15 | .11 | -.14 | -.05 | — | -.11 | .12 | .28a | -.68c | .16 | -.12 | -.18 | .58c |
| 12. Cortisol Reactivity | -0.02 (0.29) | 0.00 (0.23) | .02 | .03 | .05 | -.01 | .04 | .01 | -.01 | -.60c | .05 | -.04 | .04 | — | -.01 | .04 | .08 | -.55c | .03 | -.01 | -.02 |
| 13. Anger Reactivity | 2.71 (3.34) | 2.57 (3.25) | .04 | .00 | .05 | -.01 | .00 | .02 | .06 | .01 | -.19a | -.02 | .03 | -.07 | — | .25a | -.35b | .18 | -.93c | -.23a | .12 |
| 14. Sadness Reactivity | 0.82 (2.45) | 0.81 (2.36) | -.02 | -.12 | -.06 | -.17a | -.07 | -.08 | -.05 | .10 | .01 | -.27c | .03 | -.05 | .35c | — | -.31b | -.05 | -.32b | -.93c | .15 |
| 15. Happiness Reactivity | -4.01 (3.19) | -3.99 (3.07) | .18a | .16a | .05 | .14 | .05 | .17a | .07 | -.06 | .11 | .06 | -.67c | .03 | -.25b | -.15 | — | -.20 | .32b | .27a | -.81c |
| 16. Cortisol Recovery | -0.05 (0.25) | -0.01 (0.26) | .24b | .15 | -.01 | .16 | -.01 | .17 | .24b | -.26b | -.03 | -.08 | -.08 | -.39c | -.02 | -.05 | .00 | — | -.20 | .12 | .07 |
| 17. Anger Recovery | -2.67 (3.16) | -2.64 (3.08) | -.04 | .03 | -.05 | .03 | -.01 | -.02 | -.03 | .00 | -.09 | -.06 | -.01 | .04 | -.92c | -.35c | .26b | .04 | — | .35b | -.20 |
| 18. Sadness Recovery | -0.99 (2.28) | -0.83 (2.46) | -.01 | .08 | .00 | .15 | .06 | .08 | -.02 | -.04 | -.11 | .05 | .02 | .06 | -.28c | -.84c | .16a | -.03 | .33c | — | -.22 |
| 19. Happiness Recovery | 4.11 (3.33) | 4.08 (3.35) | -.10 | -.09 | -.06 | -.07 | -.01 | -.08 | -.01 | .13 | -.04 | -.06 | .44c | -.01 | .23b | .20a | -.76c | -.06 | -.32c | -.20a | — |

*Note*: a *p*< .05, b *p* < .01, c *p* < .001. Correlations for participants below the poverty line are found below the diagonal, and participants above the poverty line are found above the diagonal. Emotion reactivity = Retrospective report of Emotion during Trier Social Stress Test – Baseline report of Emotion. Emotion Recovery = Final report of Emotion - Retrospective report of Emotion during Trier Social Stress Test. Cortisol reactivity = Cortisol 30 min. Post-Trier Social Stress Test Onset – Baseline Cortisol. Cortisol Recovery = Cortisol 60 min. Post-Trier Social Stress Test Onset - Cortisol 30 min. Post-Trier Social Stress Test Onset.

*Table S4*. Descriptive statistics and correlations between study variables for male participants (below) and female participants (above).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Male M (SD)* | *Female M (SD)* | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |
| 1. Alcohol by 14 | 0.20 (0.40) | 0.21 (0.41) | — | .42c | .36c | .35c | .36c | .34c | .33c | .04 | -.06 | -.02 | -.20a | -.09 | -.03 | -.08 | .25b | .14 | .07 | .05 | -.14 |
| 2. Alcohol by 16 | 0.38 (0.49) | 0.42 (0.49) | .38c | — | .35c | .60c | .18a | .33c | .31c | -.09 | -.03 | -.01 | -.13 | .03 | .02 | -.11 | .21a | .00 | .01 | .07 | -.12 |
| 3. Marijuana by 14 | 0.17 (0.38) | 0.20 (0.40) | .48c | .28b | — | .50c | .28c | .01 | .32c | -.06 | -.07 | .10 | -.03 | .06 | -.07 | -.20a | .11 | -.05 | .07 | .09 | -.02 |
| 4. Marijuana by 16 | 0.32 (0.47) | 0.30 (0.46) | .40c | .36c | .40c | — | .17a | .30c | .38c | -.03 | -.10 | -.10 | -.13 | .02 | -.08 | -.16 | .22a | -.05 | .11 | .14 | -.12 |
| 5. Cigarettes by 14 | 0.11 (0.32) | 0.05 (0.21) | .47c | .26b | .45c | .26b | — | .35c | .11 | -.06 | -.04 | -.04 | -.02 | .01 | .00 | -.11 | .08 | .11 | .00 | .10 | -.05 |
| 6. Cigarettes by 16 | 0.17 (0.38) | 0.07 (0.26) | .37c | .43c | .41c | .40c | .54c | — | .28c | -.02 | -.04 | -.02 | -.23b | -.08 | .01 | -.14 | .25b | .15 | .08 | .13 | -.17 |
| 7. Vaping by 16 | 0.34 (0.47) | 0.26 (0.44) | .23a | .29b | .06 | .52c | .12 | .38c | — | .00 | -.02 | .03 | -.06 | -.08 | .02 | -.02 | .02 | .10 | .01 | -.04 | .01 |
| 8. Baseline Cortisol | 0.15 (0.18) | 0.22 (0.24) | -.01 | .02 | -.05 | .07 | .02 | -.01 | .03 | — | -.06 | .12 | .03 | -.60c | -.08 | .00 | .02 | -.34c | .09 | .05 | -.02 |
| 9. Baseline Anger | 1.43 (1.36) | 1.18 (0.90) | .10 | .05 | .06 | .04 | -.08 | -.09 | -.01 | .06 | — | .05 | -.04 | .10 | .00 | .32c | -.02 | -.08 | -.22b | -.28b | .14 |
| 10. Baseline Sadness | 1.42 (1.47) | 1.52 (1.37) | -.10 | -.08 | -.08 | -.12 | -.07 | -.13 | -.14 | -.06 | .52c | — | -.08 | -.05 | .18a | -.19a | .00 | -.11 | -.15 | -.03 | -.01 |
| 11. Baseline Happiness | 6.50 (2.7) | 6.77 (2.66) | -.14 | -.10 | -.14 | -.03 | -.03 | .00 | -.07 | .08 | -.14 | -.15 | — | .05 | .12 | .14 | -.71c | -.12 | -.09 | -.05 | .50c |
| 12. Cortisol Reactivity | 0.03 (0.25) | -0.03 (0.25) | -.10 | -.14 | -.02 | -.15 | -.01 | -.04 | -.22a | -.67c | -.05 | .25a | -.10 | — | -.08 | .04 | .00 | -.32c | .05 | -.02 | .06 |
| 13. Anger Reactivity | 2.19 (3.25) | 2.99 (3.28) | .07 | .13 | .16 | .01 | .12 | .10 | .06 | -.07 | -.37c | -.27 | -.03 | .02 | — | .24b | -.32c | .11 | -.94c | -.24b | .24b |
| 14. Sadness Reactivity | 0.51 (1.99) | 1.05 (2.65) | .11 | .07 | .10 | .01 | -.02 | .02 | -.07 | .18 | -.26b | -.44c | .06 | -.12 | .41c | — | -.24b | -.05 | -.33c | -.88c | .22a |
| 15. Happiness Reactivity | -3.41 (2.93) | -4.42 (3.15) | .04 | .03 | .01 | -.13 | -.05 | -.05 | -.07 | -.05 | .16 | .20 | -.64c | .11 | -.18 | -.09 | — | .04 | .30c | .22a | -.74c |
| 16. Cortisol Recovery | -0.03 (0.27) | -0.02 (0.24) | .17 | .21 | .02 | .18 | -.03 | .12 | .26a | .01 | -.05 | -.26a | .15 | -.58c | -.02 | -.05 | -.20 | — | -.06 | -.02 | -.11 |
| 17. Anger Recovery | -2.22 (2.90) | -2.97 (3.22) | -.10 | -.10 | -.21a | -.07 | -.10 | -.13 | -.08 | .04 | .12 | .12 | .04 | -.02 | -.90c | -.35c | .20 | .01 | — | .33c | -.33c |
| 18. Sadness Recovery | -0.49 (1.93) | -1.18 (2.67) | -.12 | -.05 | -.11 | -.08 | .02 | -.01 | .00 | -.14 | -.04 | .18 | -.01 | .13 | -.29b | -.81c | .09 | .06 | .33 | — | -.22a |
| 19. Happiness Recovery | 3.47 (3.27) | 4.56 (3.32) | -.07 | -.08 | -.04 | .16 | .09 | .08 | .16 | .13 | -.07 | -.09 | .47c | -.10 | .08 | .09 | -.81 | .09 | -.16 | -.14 | — |

*Note*: a *p*< .05, b *p* < .01, c *p* < .001. Correlations for male participants are found below the diagonal, and female participants are found above the diagonal. Emotion reactivity = Retrospective report of Emotion during Trier Social Stress Test – Baseline report of Emotion. Emotion Recovery = Final report of Emotion - Retrospective report of Emotion during Trier Social Stress Test. Cortisol reactivity = Cortisol 30 min. Post-Trier Social Stress Test Onset – Baseline Cortisol. Cortisol Recovery = Cortisol 60 min. Post-Trier Social Stress Test Onset - Cortisol 30 min. Post-Trier Social Stress Test Onset.

*Table S5*. Cortisol, sadness, anger, and happiness responses as a function of cigarette use by age 14.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.18\*\*\* | 0.02 | 2.29\*\*\* | 0.16 | 3.47\*\*\* | 0.17 | 3.48\*\*\* | 0.24 |
| Above Poverty Line | -0.01 | 0.02 | -0.15 | 0.18 | -0.09 | 0.19 | -0.05 | 0.28 |
| Female | 0.01 | 0.02 | 0.14 | 0.17 | 0.10 | 0.18 | -0.15 | 0.27 |
| Mother's Education | 0.00 | 0.01 | 0.01 | 0.06 | -0.01 | 0.06 | -0.09 | 0.09 |
| Grade | 0.01 | 0.01 | -0.24 | 0.14 | -0.19 | 0.15 | 0.37 | 0.22 |
| Cigarette Use | -0.01 | 0.05 | -0.93\* | 0.37 | -0.04 | 0.43 | 0.08 | 0.57 |
| Reactivity Time | 0.000 | 0.000 | 0.10\*\*\* | 0.01 | 0.28\*\*\* | 0.02 | -0.42\*\*\* | 0.02 |
| Cigarette Use X Reactivity Time | 0.000 | 0.002 | -0.09 | 0.05 | 0.02 | 0.07 | 0.05 | 0.08 |
| Recovery Time | -0.001 | 0.001 | -0.02\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Cigarette Use X Recovery Time | 0.001 | 0.002 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, cigarette use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S6*. Cortisol, sadness, anger, and happiness responses as a function of time and alcohol use by age 14.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.18\*\*\* | 0.02 | 2.19\*\*\* | 0.16 | 3.32\*\*\* | 0.18 | 3.56\*\*\* | 0.25 |
| Above Poverty Line | -0.01 | 0.02 | -0.16 | 0.18 | -0.06 | 0.19 | -0.08 | 0.28 |
| Female | 0.01 | 0.02 | 0.22 | 0.17 | 0.11 | 0.18 | -0.15 | 0.26 |
| Mother's Education | 0.00 | 0.01 | 0.02 | 0.06 | -0.01 | 0.06 | -0.08 | 0.09 |
| Grade | 0.02 | 0.01 | -0.23 | 0.14 | -0.17 | 0.15 | 0.33 | 0.23 |
| Alcohol Use | -0.03 | 0.03 | -0.09 | 0.24 | 0.46 | 0.28 | -0.23 | 0.38 |
| Reactivity Time | 0.000 | 0.001 | 0.09\*\*\* | 0.01 | 0.27\*\*\* | 0.02 | -0.44\*\*\* | 0.02 |
| Alcohol Use X Reactivity Time | -0.002 | 0.001 | 0.02 | 0.03 | 0.04 | 0.05 | 0.09 | 0.05 |
| Recovery Time | -0.001 | 0.001 | -0.01\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Alcohol Use X Recovery Time | 0.002 | 0.002 | 0.00 | 0.00 | 0.00 | 0.01 | -0.01 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, alcohol use was dummy-coded (0 = never used, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S7*. Cortisol, sadness, anger, and happiness responses as a function of time and marijuana use by age 14.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.18\*\*\* | 0.02 | 2.26\*\*\* | 0.16 | 3.40\*\*\* | 0.18 | 3.48\*\*\* | 0.25 |
| Above Poverty Line | -0.01 | 0.02 | -0.15 | 0.18 | -0.07 | 0.19 | -0.06 | 0.29 |
| Female | 0.02 | 0.02 | 0.22 | 0.17 | 0.11 | 0.18 | -0.15 | 0.27 |
| Mother's Education | 0.00 | 0.01 | 0.02 | 0.06 | 0.00 | 0.06 | -0.09 | 0.09 |
| Grade | 0.01 | 0.01 | -0.22 | 0.14 | -0.20 | 0.15 | 0.38 | 0.23 |
| Marijuana Use | -0.04 | 0.03 | -0.51\* | 0.25 | 0.11 | 0.29 | 0.06 | 0.39 |
| Reactivity Time | 0.000 | 0.001 | 0.11\*\*\* | 0.01 | 0.28\*\*\* | 0.02 | -0.43\*\*\* | 0.02 |
| Marijuana Use X Reactivity Time | -0.001 | 0.001 | -0.08\* | 0.03 | 0.01 | 0.05 | 0.08 | 0.05 |
| Recovery Time | -0.001 | 0.001 | -0.02\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Marijuana Use X Recovery Time | 0.001 | 0.002 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, marijuana use was dummy-coded (0 = never used, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S8*. Cortisol, sadness, anger, and happiness responses as a function of time and cigarette use by age 16.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.19\*\*\* | 0.02 | 2.38\*\*\* | 0.17 | 3.15\*\*\* | 0.18 | 3.57\*\*\* | 0.27 |
| Above Poverty Line | -0.01 | 0.02 | -0.19 | 0.19 | -0.04 | 0.19 | -0.07 | 0.29 |
| Female | 0.01 | 0.02 | 0.11 | 0.18 | 0.27 | 0.17 | -0.22 | 0.28 |
| Mother's Education | 0.00 | 0.01 | 0.02 | 0.06 | 0.01 | 0.06 | -0.14 | 0.09 |
| Grade | -0.02 | 0.01 | -0.24 | 0.14 | -0.14 | 0.14 | 0.16 | 0.22 |
| Cigarette Use | -0.01 | 0.04 | -0.83\*\* | 0.31 | 0.74\* | 0.35 | 0.10 | 0.49 |
| Reactivity Time | 0.000 | 0.001 | 0.10\*\*\* | 0.01 | 0.26\*\*\* | 0.02 | -0.43\*\*\* | 0.02 |
| Cigarette Use X Reactivity Time | 0.000 | 0.002 | -0.06 | 0.04 | 0.10 | 0.06 | 0.13 | 0.07 |
| Recovery Time | -0.001 | 0.001 | -0.02\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Cigarette Use X Recovery Time | 0.003 | 0.002 | 0.01 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, cigarette use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S9*. Cortisol, sadness, anger, and happiness responses as a function of time and alcohol use by age 16.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.20\*\*\* | 0.02 | 2.34\*\*\* | 0.18 | 3.16\*\*\* | 0.19 | 3.48\*\*\* | 0.29 |
| Above Poverty Line | -0.01 | 0.02 | -0.15 | 0.19 | -0.07 | 0.19 | -0.05 | 0.29 |
| Female | 0.01 | 0.02 | 0.15 | 0.18 | 0.24 | 0.17 | -0.18 | 0.27 |
| Mother's Education | 0.00 | 0.01 | 0.03 | 0.06 | 0.00 | 0.06 | -0.14 | 0.09 |
| Grade | -0.02 | 0.01 | -0.24 | 0.14 | -0.14 | 0.14 | 0.17 | 0.22 |
| Alcohol Use | -0.02 | 0.03 | -0.25 | 0.21 | 0.24 | 0.23 | 0.14 | 0.32 |
| Reactivity Time | 0.000 | 0.001 | 0.10\*\*\* | 0.02 | 0.26\*\*\* | 0.03 | -0.45\*\*\* | 0.03 |
| Alcohol Use X Reactivity Time | -0.001 | 0.001 | -0.02 | 0.03 | 0.02 | 0.04 | 0.09\* | 0.04 |
| Recovery Time | -0.001 | 0.001 | -0.02\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Alcohol Use X Recovery Time | 0.000 | 0.001 | 0.00 | 0.00 | -0.01 | 0.01 | -0.01 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, alcohol use was dummy-coded (0 = never used, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S10*. Cortisol, sadness, anger, and happiness responses as a function of time and marijuana use by age 16.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.20\*\*\* | 0.02 | 2.48\*\*\* | 0.18 | 3.31\*\*\* | 0.19 | 3.46\*\*\* | 0.28 |
| Above Poverty Line | -0.01 | 0.02 | -0.12 | 0.18 | -0.06 | 0.19 | -0.06 | 0.29 |
| Female | 0.01 | 0.02 | 0.14 | 0.17 | 0.24 | 0.17 | -0.19 | 0.27 |
| Mother's Education | 0.00 | 0.01 | 0.04 | 0.06 | 0.00 | 0.06 | -0.13 | 0.09 |
| Grade | -0.02 | 0.01 | -0.21 | 0.14 | -0.13 | 0.14 | 0.16 | 0.22 |
| Marijuana Use | -0.01 | 0.03 | -0.81\*\*\* | 0.22 | -0.20 | 0.25 | 0.32 | 0.34 |
| Reactivity Time | 0.000 | 0.001 | 0.12\*\*\* | 0.02 | 0.28\*\*\* | 0.02 | -0.45\*\*\* | 0.03 |
| Marijuana Use X Reactivity Time | -0.001 | 0.001 | -0.07\* | 0.03 | -0.03 | 0.04 | 0.11\* | 0.05 |
| Recovery Time | -0.001 | 0.001 | -0.02\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Marijuana Use X Recovery Time | 0.000 | 0.001 | 0.01\* | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, marijuana use was dummy-coded (0 = never used, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S11*. Cortisol, sadness, anger, and happiness responses as a function of time and vaping use by age 16.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | Anger | | Happiness | |
|  | *B* | *SE* | *B* | *SE* | *B* | *SE* | *B* | *SE* |
| Intercept | 0.21\*\*\* | 0.02 | 2.36\*\*\* | 0.18 | 3.15\*\*\* | 0.19 | 3.66\*\*\* | 0.28 |
| Above Poverty Line | -0.01 | 0.02 | -0.14 | 0.19 | -0.07 | 0.19 | -0.05 | 0.29 |
| Female | 0.01 | 0.02 | 0.13 | 0.17 | 0.25 | 0.17 | -0.20 | 0.27 |
| Mother's Education | 0.00 | 0.01 | 0.03 | 0.06 | 0.00 | 0.06 | -0.13 | 0.09 |
| Grade | -0.02 | 0.01 | -0.23 | 0.14 | -0.15 | 0.14 | 0.18 | 0.22 |
| Vaping Use | -0.05 | 0.03 | -0.39 | 0.22 | 0.37 | 0.25 | -0.35 | 0.34 |
| Reactivity Time | 0.001 | 0.001 | 0.10\*\*\* | 0.02 | 0.26\*\*\* | 0.02 | -0.42\*\*\* | 0.03 |
| Vaping X Reactivity Time | -0.002 | 0.001 | -0.03 | 0.03 | 0.04 | 0.04 | 0.00 | 0.05 |
| Recovery Time | -0.001 | 0.001 | -0.01\*\*\* | 0.00 | -0.04\*\*\* | 0.00 | 0.06\*\*\* | 0.00 |
| Vaping X Recovery Time | 0.002 | 0.001 | 0.00 | 0.00 | -0.01 | 0.01 | 0.01 | 0.01 |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, vaping use was dummy-coded (0 = never used, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is less than 0.01.

*Table S12*. Cortisol, sadness, anger, and happiness responses as a function of time, cigarette use by age 14, and poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.17\*\*\* | 0.02 | | 2.27\*\*\* | 0.16 | | 3.53\*\*\* | 0.18 | | 3.50\*\*\* | 0.25 | |
| Above Poverty Line | 0.01 | 0.03 | | -0.09 | 0.22 | | -0.28 | 0.25 | | -0.10 | 0.34 | |
| Female | 0.02 | 0.02 | | 0.14 | 0.17 | | 0.09 | 0.18 | | -0.16 | 0.27 | |
| Mother's Education | 0.00 | 0.01 | | 0.01 | 0.06 | | 0.00 | 0.06 | | -0.09 | 0.09 | |
| Grade | 0.01 | 0.01 | | -0.24 | 0.14 | | -0.18 | 0.15 | | 0.37 | 0.22 | |
| Cigarette Use | 0.06 | 0.06 | | -0.89 | 0.47 | | -0.51 | 0.53 | | -0.11 | 0.71 | |
| Cigarette Use X Above Poverty Line | -0.19 | 0.10 | | -0.13 | 0.76 | | 1.36 | 0.90 | | 0.50 | 1.19 | |
| Reactivity Time | 0.000 | 0.001 | | 0.10\*\*\* | 0.02 | | 0.30\*\*\* | 0.02 | | -0.42\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.000 | 0.001 | | 0.00 | 0.03 | | -0.04 | 0.04 | | 0.00 | 0.05 | |
| Cigarette Use X Reactivity Time | 0.000 | 0.002 | | -0.08 | 0.06 | | -0.05 | 0.09 | | 0.09 | 0.10 | |
| Cigarette Use X Reactivity Time X Above Poverty Line | -0.001 | 0.004 | | -0.04 | 0.10 | | 0.21 | 0.15 | | -0.09 | 0.16 | |
| Recovery Time | 0.000 | 0.001 | | -0.02\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.002 | 0.001 | | 0.00 | 0.00 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Cigarette Use X Recovery Time | 0.000 | 0.003 | | 0.01 | 0.01 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Cigarette Use X Recovery Time X Above Poverty Line | 0.002 | 0.005 | | 0.01 | 0.01 | | -0.02 | 0.02 | | 0.01 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, cigarette use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S13*. Cortisol, sadness, anger, and happiness responses as a function of time, alcohol use by age 14, poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | | Sadness | | | Anger | | | Happiness | | |
|  | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | | 0.18\*\*\* | 0.02 | | 2.19\*\*\* | 0.17 | | 3.30\*\*\* | 0.19 | | 3.61\*\*\* | 0.26 | |
| Above Poverty Line | | 0.00 | 0.03 | | -0.14 | 0.23 | | -0.01 | 0.27 | | -0.24 | 0.36 | |
| Female | | 0.01 | 0.02 | | 0.22 | 0.17 | | 0.11 | 0.18 | | -0.15 | 0.26 | |
| Mother's Education | | 0.00 | 0.01 | | 0.02 | 0.06 | | -0.01 | 0.06 | | -0.09 | 0.09 | |
| Grade | | 0.01 | 0.01 | | -0.23 | 0.14 | | -0.17 | 0.15 | | 0.35 | 0.23 | |
| Alcohol Use | | -0.02 | 0.04 | | -0.15 | 0.29 | | 0.61 | 0.34 | | -0.49 | 0.45 | |
| Alcohol Use X Above Poverty Line | | -0.02 | 0.07 | | 0.17 | 0.52 | | -0.48 | 0.61 | | 0.86 | 0.81 | |
| Reactivity Time | | 0.000 | 0.001 | | 0.09\*\*\* | 0.02 | | 0.27\*\*\* | 0.03 | | -0.44\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | | 0.001 | 0.001 | | -0.01 | 0.03 | | -0.01 | 0.04 | | 0.01 | 0.05 | |
| Alcohol Use X Reactivity Time | | 0.001 | 0.001 | | 0.01 | 0.04 | | 0.05 | 0.06 | | 0.11 | 0.06 | |
| Alcohol Use X Reactivity Time X Above Poverty Line | | -0.007\* | 0.003 | | 0.03 | 0.07 | | -0.01 | 0.10 | | -0.05 | 0.12 | |
| Recovery Time | | -0.001 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | | -0.001 | 0.001 | | 0.00 | 0.00 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Alcohol Use X Recovery Time | | 0.004\* | 0.002 | | 0.00 | 0.01 | | -0.01 | 0.01 | | -0.01 | 0.01 | |
| Alcohol Use X Recovery Time X Above Poverty Line | | -0.005 | 0.003 | | 0.00 | 0.01 | | 0.02 | 0.01 | | -0.01 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, alcohol use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S14*. Cortisol, sadness, anger, and happiness responses as a function of time, marijuana use by age 14, poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.17\*\*\* | 0.02 | | 2.25\*\*\* | 0.17 | | 3.36\*\*\* | 0.19 | | 3.50\*\*\* | 0.26 | |
| Above Poverty Line | 0.01 | 0.03 | | -0.08 | 0.23 | | -0.02 | 0.27 | | -0.10 | 0.36 | |
| Female | 0.02 | 0.02 | | 0.21 | 0.17 | | 0.14 | 0.18 | | -0.17 | 0.27 | |
| Mother's Education | 0.00 | 0.01 | | 0.02 | 0.06 | | 0.00 | 0.06 | | -0.09 | 0.09 | |
| Grade | 0.01 | 0.01 | | -0.22 | 0.14 | | -0.19 | 0.15 | | 0.37 | 0.23 | |
| Marijuana Use | -0.01 | 0.04 | | -0.50 | 0.31 | | 0.29 | 0.36 | | 0.02 | 0.48 | |
| Marijuana Use X Above Poverty Line | -0.13 | 0.07 | | -0.04 | 0.52 | | -0.51 | 0.61 | | 0.14 | 0.81 | |
| Reactivity Time | 0.000 | 0.001 | | 0.11\*\*\* | 0.02 | | 0.28\*\*\* | 0.03 | | -0.44\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.000 | 0.001 | | 0.00 | 0.03 | | -0.01 | 0.04 | | 0.00 | 0.05 | |
| Marijuana Use X Reactivity Time | 0.001 | 0.002 | | -0.07 | 0.04 | | 0.02 | 0.06 | | 0.09 | 0.07 | |
| Marijuana Use X Reactivity Time X Above Poverty Line | -0.004 | 0.003 | | -0.01 | 0.07 | | -0.01 | 0.10 | | -0.04 | 0.11 | |
| Recovery Time | 0.000 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.002 | 0.001 | | 0.00 | 0.00 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Marijuana Use X Recovery Time | 0.000 | 0.002 | | 0.00 | 0.01 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Marijuana Use X Recovery Time X Above Poverty Line | 0.001 | 0.003 | | 0.00 | 0.01 | | 0.00 | 0.01 | | 0.01 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, marijuana use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for cortisol models when the magnitude of the estimate is < 0.01.

*Table S15*. Cortisol, sadness, anger, and happiness responses as a function of time, cigarette use by age 16, poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.20\*\*\* | 0.02 | | 2.34\*\*\* | 0.18 | | 3.13\*\*\* | 0.19 | | 3.52\*\*\* | 0.28 | |
| Above Poverty Line | -0.01 | 0.03 | | -0.07 | 0.23 | | 0.01 | 0.25 | | 0.09 | 0.35 | |
| Female | 0.01 | 0.02 | | 0.11 | 0.18 | | 0.27 | 0.17 | | -0.22 | 0.28 | |
| Mother's Education | 0.00 | 0.01 | | 0.02 | 0.06 | | 0.01 | 0.06 | | -0.14 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.24 | 0.14 | | -0.14 | 0.14 | | 0.15 | 0.22 | |
| Cigarette Use | -0.02 | 0.05 | | -0.78\* | 0.35 | | 0.83\* | 0.39 | | 0.38 | 0.55 | |
| Cigarette Use X Above Poverty Line | 0.04 | 0.09 | | -0.20 | 0.77 | | -0.44 | 0.88 | | -1.40 | 1.22 | |
| Reactivity Time | 0.000 | 0.001 | | 0.10\*\*\* | 0.02 | | 0.26\*\*\* | 0.03 | | -0.44\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.000 | 0.001 | | 0.01 | 0.03 | | 0.00 | 0.04 | | 0.03 | 0.05 | |
| Cigarette Use X Reactivity Time | 0.000 | 0.002 | | -0.06 | 0.05 | | 0.10 | 0.07 | | 0.16\* | 0.08 | |
| Cigarette Use X Reactivity Time X Above Poverty Line | -0.005 | 0.004 | | -0.02 | 0.10 | | -0.01 | 0.15 | | -0.16 | 0.17 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.001 | 0.001 | | 0.00 | 0.00 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Cigarette Use X Recovery Time | 0.004\* | 0.002 | | 0.01 | 0.01 | | -0.02 | 0.01 | | -0.01 | 0.01 | |
| Cigarette Use X Recovery Time X Above Poverty Line | -0.006 | 0.004 | | 0.01 | 0.01 | | 0.02 | 0.02 | | -0.01 | 0.03 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, cigarette use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S16*. Cortisol, sadness, anger, and happiness responses as a function of time, alcohol use by age 16, and poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.19\*\*\* | 0.02 | | 2.40\*\*\* | 0.20 | | 3.29\*\*\* | 0.21 | | 3.37\*\*\* | 0.31 | |
| Above Poverty Line | 0.02 | 0.04 | | -0.32 | 0.28 | | -0.45 | 0.31 | | 0.25 | 0.44 | |
| Female | 0.01 | 0.02 | | 0.15 | 0.18 | | 0.23 | 0.17 | | -0.15 | 0.27 | |
| Mother's Education | 0.00 | 0.01 | | 0.03 | 0.06 | | -0.01 | 0.06 | | -0.12 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.24 | 0.14 | | -0.14 | 0.14 | | 0.17 | 0.22 | |
| Alcohol Use | 0.00 | 0.03 | | -0.49 | 0.25 | | -0.05 | 0.28 | | 0.38 | 0.39 | |
| Alcohol Use X Above Poverty Line | -0.06 | 0.06 | | 0.72 | 0.44 | | 0.89 | 0.49 | | -0.72 | 0.68 | |
| Reactivity Time | 0.000 | 0.001 | | 0.12\*\*\* | 0.02 | | 0.28\*\*\* | 0.03 | | -0.46\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.001 | 0.001 | | -0.04 | 0.04 | | -0.06 | 0.05 | | 0.02 | 0.06 | |
| Alcohol Use X Reactivity Time | 0.001 | 0.001 | | -0.06 | 0.03 | | -0.02 | 0.05 | | 0.11\* | 0.05 | |
| Alcohol Use X Reactivity Time X Above Poverty Line | -0.004\* | 0.002 | | 0.13\* | 0.06 | | 0.12 | 0.08 | | -0.05 | 0.09 | |
| Recovery Time | -0.001 | 0.001 | | -0.02\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.001 | 0.002 | | 0.00 | 0.00 | | 0.01 | 0.01 | | 0.00 | 0.01 | |
| Alcohol Use X Recovery Time | 0.001 | 0.001 | | 0.01 | 0.00 | | 0.00 | 0.01 | | -0.01 | 0.01 | |
| Alcohol Use X Recovery Time X Above Poverty Line | -0.001 | 0.003 | | -0.01 | 0.01 | | -0.02 | 0.01 | | -0.01 | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, alcohol use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S17*. Cortisol, sadness, anger, and happiness responses as a function of time, marijuana use by age 16, and poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.19\*\*\* | 0.02 | | 2.57\*\*\* | 0.19 | | 3.26\*\*\* | 0.20 | | 3.35\*\*\* | 0.30 | |
| Above Poverty Line | 0.02 | 0.04 | | -0.34 | 0.26 | | 0.10 | 0.30 | | 0.19 | 0.41 | |
| Female | 0.01 | 0.02 | | 0.11 | 0.17 | | 0.25 | 0.18 | | -0.16 | 0.28 | |
| Mother's Education | 0.00 | 0.01 | | 0.03 | 0.06 | | 0.00 | 0.06 | | -0.13 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.23 | 0.14 | | -0.12 | 0.14 | | 0.19 | 0.22 | |
| Marijuana Use | 0.01 | 0.04 | | -1.23\*\*\* | 0.27 | | -0.02 | 0.31 | | 0.61 | 0.42 | |
| Marijuana Use X Above Poverty Line | -0.06 | 0.06 | | 1.14\* | 0.45 | | -0.50 | 0.51 | | -0.81 | 0.72 | |
| Reactivity Time | 0.000 | 0.001 | | 0.12\*\*\* | 0.02 | | 0.28\*\*\* | 0.03 | | -0.46\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.001 | 0.001 | | -0.01 | 0.04 | | 0.01 | 0.05 | | 0.02 | 0.06 | |
| Marijuana Use X Reactivity Time | 0.001 | 0.001 | | -0.10\*\* | 0.04 | | -0.01 | 0.05 | | 0.13\* | 0.06 | |
| Marijuana Use X Reactivity Time X Above Poverty Line | -0.004 | 0.002 | | 0.09 | 0.06 | | -0.06 | 0.09 | | -0.07 | 0.10 | |
| Recovery Time | -0.001 | 0.001 | | -0.02\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.001 | 0.002 | | 0.00 | 0.00 | | 0.00 | 0.01 | | 0.00 | 0.01 | |
| Marijuana Use X Recovery Time | 0.001 | 0.002 | | 0.01\*\* | 0.00 | | 0.00 | 0.01 | | -0.01 | 0.01 | |
| Marijuana Use X Recovery Time X Above Poverty Line | -0.002 | 0.003 | | -0.02 | 0.01 | | 0.01 | 0.01 | | 0.00 | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, marijuana use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as minutes before peak level, and recovery time was coded as minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S18*. Cortisol, sadness, anger, and happiness responses as a function of time, vaping by age 16, and poverty status.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.20\*\*\* | 0.02 | | 2.31\*\*\* | 0.19 | | 3.15\*\*\* | 0.20 | | 3.74\*\*\* | 0.30 | |
| Above Poverty Line | 0.01 | 0.03 | | 0.03 | 0.26 | | -0.05 | 0.29 | | -0.20 | 0.40 | |
| Female | 0.01 | 0.02 | | 0.13 | 0.18 | | 0.25 | 0.17 | | -0.24 | 0.27 | |
| Mother's Education | 0.00 | 0.01 | | 0.03 | 0.06 | | -0.01 | 0.06 | | -0.14 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.23 | 0.14 | | -0.15 | 0.14 | | 0.16 | 0.22 | |
| Vaping | -0.03 | 0.04 | | -0.35 | 0.27 | | 0.42 | 0.31 | | -0.53 | 0.42 | |
| Vaping X Above Poverty Line | -0.05 | 0.06 | | -0.14 | 0.47 | | -0.14 | 0.52 | | 0.55 | 0.72 | |
| Reactivity Time | 0.000 | 0.001 | | 0.10\*\*\* | 0.02 | | 0.25\*\*\* | 0.03 | | -0.43\*\*\* | 0.03 | |
| Reactivity Time X Above Poverty Line | 0.001 | 0.001 | | 0.02 | 0.03 | | 0.01 | 0.05 | | 0.04 | 0.06 | |
| Vaping X Reactivity Time | 0.000 | 0.001 | | -0.03 | 0.04 | | 0.07 | 0.05 | | 0.04 | 0.06 | |
| Vaping X Reactivity Time X Above Poverty Line | -0.005\* | 0.002 | | 0.00 | 0.06 | | -0.08 | 0.09 | | -0.11 | 0.10 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.04\*\*\* | 0.00 | | 0.06\*\*\* | 0.00 | |
| Recovery Time X Above Poverty Line | -0.001 | 0.002 | | -0.01 | 0.00 | | 0.00 | 0.01 | | -0.01 | 0.01 | |
| Vaping X Recovery Time | 0.003 | 0.002 | | 0.00 | 0.00 | | -0.01 | 0.01 | | 0.00 | 0.01 | |
| Vaping X Recovery Time X Above Poverty Line | -0.003 | 0.003 | | 0.00 | 0.01 | | 0.01 | 0.01 | | 0.01 | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, vaping was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S19*. Cortisol, sadness, anger, and happiness responses as a function of time, cigarette use by age 14, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.19\*\*\* | 0.02 | | 2.09\*\*\* | 0.17 | | 3.18\*\*\* | 0.2 | | 3.82\*\*\* | 0.27 | |
| Above Poverty Line | -0.01 | 0.02 | | -0.15 | 0.18 | | -0.09 | 0.19 | | -0.04 | 0.28 | |
| Female | -0.01 | 0.03 | | 0.49\* | 0.20 | | 0.59\* | 0.24 | | -0.73\* | 0.32 | |
| Mother's Education | 0.00 | 0.01 | | 0.01 | 0.06 | | -0.01 | 0.06 | | -0.08 | 0.09 | |
| Grade | 0.01 | 0.01 | | -0.24 | 0.14 | | -0.18 | 0.15 | | 0.36 | 0.22 | |
| Cigarette Use | 0.01 | 0.06 | | -0.58 | 0.45 | | 0.45 | 0.53 | | -0.59 | 0.70 | |
| Cigarette Use X Female | -0.09 | 0.10 | | -0.86 | 0.78 | | -1.17 | 0.92 | | 1.66 | 1.23 | |
| Reactivity Time | 0.001 | 0.001 | | 0.07\*\*\* | 0.02 | | 0.22\*\*\* | 0.03 | | -0.34\*\*\* | 0.03 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.06\* | 0.03 | | 0.11\*\* | 0.04 | | -0.15\*\*\* | 0.04 | |
| Cigarette Use X Reactivity Time | -0.001 | 0.002 | | -0.03 | 0.06 | | 0.11 | 0.09 | | -0.07 | 0.10 | |
| Cigarette Use X Reactivity Time X Female | 0.000 | 0.004 | | -0.14 | 0.10 | | -0.18 | 0.15 | | 0.26 | 0.17 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.05\*\*\* | 0.00 | |
| Recovery Time X Female | 0.000 | 0.001 | | -0.01\*\* | 0.00 | | -0.01\* | 0.01 | | 0.02\* | 0.01 | |
| Cigarette Use X Recovery Time | -0.001 | 0.003 | | 0.00 | 0.01 | | -0.01 | 0.01 | | 0.02 | 0.01 | |
| Cigarette Use X Recovery Time X Female | 0.007 | 0.005 | | 0.02 | 0.01 | | 0.01 | 0.02 | | -0.03 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, cigarette use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S20*. Cortisol, sadness, anger, and happiness responses as a function of time, alcohol use by age 14, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.19\*\*\* | 0.02 | | 1.97\*\*\* | 0.18 | | 3.01\*\*\* | 0.21 | | 3.89\*\*\* | 0.28 | |
| Above Poverty Line | -0.01 | 0.02 | | -0.16 | 0.18 | | -0.06 | 0.19 | | -0.07 | 0.28 | |
| Female | 0.00 | 0.03 | | 0.62\*\* | 0.22 | | 0.65\* | 0.25 | | -0.72\* | 0.34 | |
| Mother's Education | 0.00 | 0.01 | | 0.02 | 0.06 | | -0.01 | 0.06 | | -0.08 | 0.09 | |
| Grade | 0.02 | 0.01 | | -0.23 | 0.14 | | -0.15 | 0.15 | | 0.31 | 0.23 | |
| Alcohol Use | 0.02 | 0.05 | | 0.11 | 0.37 | | 0.91\* | 0.43 | | -0.65 | 0.57 | |
| Alcohol Use X Female | -0.07 | 0.07 | | -0.38 | 0.49 | | -0.80 | 0.57 | | 0.74 | 0.76 | |
| Reactivity Time | 0.001 | 0.001 | | 0.04\* | 0.02 | | 0.21\*\*\* | 0.03 | | -0.35\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.08\*\* | 0.03 | | 0.11\*\* | 0.04 | | -0.15\*\* | 0.05 | |
| Alcohol Use X Reactivity Time | 0.000 | 0.002 | | 0.08 | 0.05 | | 0.08 | 0.07 | | 0.01 | 0.08 | |
| Alcohol Use X Reactivity Time X Female | -0.002 | 0.003 | | -0.10 | 0.06 | | -0.07 | 0.09 | | 0.15 | 0.11 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.06\*\*\* | 0.01 | |
| Recovery Time X Female | 0.000 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.01\* | 0.01 | | 0.01\* | 0.01 | |
| Alcohol Use X Recovery Time | 0.001 | 0.002 | | -0.01 | 0.01 | | -0.01 | 0.01 | | -0.01 | 0.01 | |
| Alcohol Use X Recovery Time X Female | 0.002 | 0.003 | | 0.01 | 0.01 | | 0.02 | 0.01 | | -0.01 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, alcohol use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S21*. Cortisol, sadness, anger, and happiness responses as a function of time, marijuana use by age 14, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.20\*\*\* | 0.02 | | 1.99\*\*\* | 0.18 | | 2.97\*\*\* | 0.20 | | 3.88\*\*\* | 0.28 | |
| Above Poverty Line | -0.01 | 0.02 | | -0.15 | 0.18 | | -0.02 | 0.19 | | -0.10 | 0.29 | |
| Female | -0.01 | 0.03 | | 0.71\*\* | 0.22 | | 0.84\*\*\* | 0.25 | | -0.83\* | 0.34 | |
| Mother's Education | 0.00 | 0.01 | | 0.02 | 0.06 | | 0.00 | 0.06 | | -0.09 | 0.09 | |
| Grade | 0.02 | 0.01 | | -0.22 | 0.14 | | -0.15 | 0.15 | | 0.33 | 0.23 | |
| Marijuana Use | -0.03 | 0.05 | | -0.02 | 0.38 | | 1.14\*\* | 0.44 | | -0.68 | 0.59 | |
| Marijuana Use X Female | -0.03 | 0.07 | | -0.88 | 0.51 | | -1.83\*\* | 0.59 | | 1.31 | 0.79 | |
| Reactivity Time | 0.001 | 0.001 | | 0.05\* | 0.02 | | 0.20\*\*\* | 0.03 | | -0.35\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.11\*\*\* | 0.03 | | 0.14\*\*\* | 0.04 | | -0.14\*\* | 0.05 | |
| Marijuana Use X Reactivity Time | -0.001 | 0.002 | | 0.06 | 0.05 | | 0.13 | 0.07 | | 0.02 | 0.08 | |
| Marijuana Use X Reactivity Time X Female | 0.000 | 0.003 | | -0.23\*\*\* | 0.07 | | -0.21\* | 0.10 | | 0.11 | 0.11 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.05\*\*\* | 0.01 | |
| Recovery Time X Female | 0.000 | 0.001 | | -0.01\*\*\* | 0.00 | | -0.02\*\* | 0.01 | | 0.01\* | 0.01 | |
| Marijuana Use X Recovery Time | 0.001 | 0.002 | | -0.01 | 0.01 | | -0.02\* | 0.01 | | 0.00 | 0.01 | |
| Marijuana Use X Recovery Time X Female | 0.000 | 0.003 | | 0.02\* | 0.01 | | 0.03\* | 0.01 | | -0.01 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 8th grade, marijuana use was dummy-coded (0 = never used by 14, 1 = used by age 14), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S22*. Cortisol, sadness, anger, and happiness responses as a function of time, cigarette use by age 16, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.21\*\*\* | 0.02 | | 2.17\*\*\* | 0.19 | | 2.89\*\*\* | 0.20 | | 3.85\*\*\* | 0.30 | |
| Above Poverty Line | -0.01 | 0.02 | | -0.19 | 0.19 | | -0.04 | 0.18 | | -0.06 | 0.29 | |
| Female | -0.02 | 0.03 | | 0.46\* | 0.22 | | 0.72\*\* | 0.24 | | -0.71\* | 0.34 | |
| Mother's Education | 0.00 | 0.01 | | 0.02 | 0.06 | | -0.01 | 0.06 | | -0.13 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.24 | 0.14 | | -0.16 | 0.14 | | 0.18 | 0.22 | |
| Cigarette Use | -0.01 | 0.05 | | -0.62 | 0.41 | | 0.29 | 0.46 | | -0.10 | 0.64 | |
| Cigarette Use X Female | -0.03 | 0.08 | | -0.38 | 0.64 | | 1.37 | 0.71 | | 0.23 | 1.00 | |
| Reactivity Time | 0.001 | 0.001 | | 0.06\*\* | 0.02 | | 0.18\*\*\* | 0.03 | | -0.34\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.07\* | 0.03 | | 0.14\*\*\* | 0.04 | | -0.16\*\*\* | 0.05 | |
| Cigarette Use X Reactivity Time | -0.001 | 0.002 | | -0.01 | 0.05 | | 0.08 | 0.08 | | -0.01 | 0.09 | |
| Cigarette Use X Reactivity Time X Female | 0.000 | 0.003 | | -0.11 | 0.09 | | 0.13 | 0.13 | | 0.29\* | 0.14 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\*\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.05\*\*\* | 0.01 | |
| Recovery Time X Female | 0.001 | 0.001 | | -0.01\*\* | 0.00 | | -0.02\*\* | 0.01 | | 0.02\*\* | 0.01 | |
| Cigarette Use X Recovery Time | 0.002 | 0.002 | | 0.00 | 0.01 | | -0.01 | 0.01 | | 0.01 | 0.01 | |
| Cigarette Use X Recovery Time X Female | 0.002 | 0.004 | | 0.01 | 0.01 | | 0.00 | 0.02 | | -0.04 | 0.02 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, cigarette use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S23*. Cortisol, sadness, anger, and happiness responses as a function of time, alcohol use by age 16, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.22\*\*\* | 0.03 | | 2.06\*\*\* | 0.22 | | 2.80\*\*\* | 0.24 | | 3.98\*\*\* | 0.34 | |
| Above Poverty Line | 0.00 | 0.02 | | -0.15 | 0.19 | | -0.07 | 0.19 | | -0.06 | 0.29 | |
| Female | -0.03 | 0.03 | | 0.67\* | 0.27 | | 0.89\*\* | 0.3 | | -1.04\* | 0.41 | |
| Mother's Education | 0.00 | 0.01 | | 0.03 | 0.06 | | -0.01 | 0.06 | | -0.13 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.24 | 0.15 | | -0.14 | 0.14 | | 0.15 | 0.23 | |
| Alcohol Use | -0.03 | 0.04 | | -0.01 | 0.31 | | 0.35 | 0.35 | | -0.34 | 0.48 | |
| Alcohol Use X Female | 0.02 | 0.05 | | -0.45 | 0.42 | | -0.21 | 0.47 | | 0.88 | 0.65 | |
| Reactivity Time | 0.002\* | 0.001 | | 0.04 | 0.03 | | 0.17\*\*\* | 0.04 | | -0.34\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.003\* | 0.001 | | 0.11\*\* | 0.03 | | 0.15\*\* | 0.05 | | -0.20\*\*\* | 0.06 | |
| Alcohol Use X Reactivity Time | -0.002 | 0.002 | | 0.05 | 0.04 | | 0.04 | 0.06 | | 0.01 | 0.07 | |
| Alcohol Use X Reactivity Time X Female | 0.002 | 0.002 | | -0.12\* | 0.05 | | -0.02 | 0.08 | | 0.15 | 0.09 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\* | 0.00 | | -0.02\*\*\* | 0.00 | | 0.05\*\*\* | 0.01 | |
| Recovery Time X Female | 0.001 | 0.002 | | -0.01\*\*\* | 0.00 | | -0.02\*\*\* | 0.01 | | 0.02\* | 0.01 | |
| Alcohol Use X Recovery Time | 0.001 | 0.002 | | 0.00 | 0.01 | | -0.01 | 0.01 | | 0.00 | 0.01 | |
| Alcohol Use X Recovery Time X Female | -0.001 | 0.002 | | 0.01 | 0.01 | | 0.01 | 0.01 | | -0.01 | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, alcohol use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Table S24*. Cortisol, sadness, anger, and happiness responses as a function of marijuana use by age 16 and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.20\*\*\* | 0.03 | | 2.18\*\*\* | 0.21 | | 2.83\*\*\* | 0.23 | | 3.97\*\*\* | 0.32 | |
| Above Poverty Line | 0.00 | 0.02 | | -0.12 | 0.19 | | -0.05 | 0.19 | | -0.06 | 0.29 | |
| Female | -0.01 | 0.03 | | 0.65\*\* | 0.24 | | 1.07\*\*\* | 0.27 | | -1.06\*\* | 0.38 | |
| Mother's Education | 0.00 | 0.01 | | 0.04 | 0.06 | | 0.00 | 0.06 | | -0.13 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.21 | 0.14 | | -0.11 | 0.14 | | 0.15 | 0.22 | |
| Marijuana Use | 0.01 | 0.04 | | -0.47 | 0.32 | | 0.27 | 0.36 | | -0.37 | 0.50 | |
| Marijuana Use X Female | -0.04 | 0.06 | | -0.60 | 0.44 | | -0.83 | 0.49 | | 1.22 | 0.69 | |
| Reactivity Time | 0.002 | 0.001 | | 0.06\* | 0.02 | | 0.18\*\*\* | 0.04 | | -0.32\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.10\*\* | 0.03 | | 0.17\*\*\* | 0.05 | | -0.21\*\*\* | 0.05 | |
| Marijuana Use X Reactivity Time | -0.001 | 0.002 | | -0.01 | 0.04 | | 0.02 | 0.06 | | -0.05 | 0.07 | |
| Marijuana Use X Reactivity Time X Female | 0.001 | 0.002 | | -0.11 | 0.06 | | -0.09 | 0.08 | | 0.26\*\* | 0.09 | |
| Recovery Time | -0.001 | 0.001 | | -0.01\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.05\*\*\* | 0.01 | |
| Recovery Time X Female | 0.000 | 0.001 | | -0.02\*\*\* | 0.00 | | -0.02\*\*\* | 0.01 | | 0.02\*\* | 0.01 | |
| Marijuana Use X Recovery Time | 0.000 | 0.002 | | 0.00 | 0.01 | | -0.01 | 0.01 | | 0.01 | 0.01 | |
| Marijuana Use X Recovery Time X Female | 0.000 | 0.003 | | 0.02\* | 0.01 | | 0.02 | 0.01 | | -0.03\* | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, marijuana use was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate < than 0.01.

*Table S25*. Cortisol, sadness, anger, and happiness responses as a function of time, vaping by age 16, and sex.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cortisol | | Sadness | | | Anger | | | Happiness | | |
|  | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | | *B* | *SE* | |
| Intercept | 0.23\*\*\* | 0.03 | | 2.33\*\*\* | 0.21 | | 2.86\*\*\* | 0.23 | | 4.06\*\*\* | 0.32 | |
| Above Poverty Line | -0.01 | 0.02 | | -0.17 | 0.19 | | -0.08 | 0.19 | | -0.04 | 0.29 | |
| Female | -0.02 | 0.03 | | 0.21 | 0.24 | | 0.76\*\* | 0.27 | | -0.90\* | 0.38 | |
| Mother's Education | 0.00 | 0.01 | | 0.03 | 0.06 | | -0.01 | 0.06 | | -0.13 | 0.09 | |
| Grade | -0.02 | 0.01 | | -0.25 | 0.14 | | -0.15 | 0.14 | | 0.17 | 0.22 | |
| Vaping | -0.04 | 0.04 | | -0.81\* | 0.32 | | 0.28 | 0.36 | | -0.72 | 0.50 | |
| Vaping X Female | -0.02 | 0.06 | | 0.83 | 0.44 | | 0.24 | 0.49 | | 0.65 | 0.69 | |
| Reactivity Time | 0.002\* | 0.001 | | 0.07\*\* | 0.02 | | 0.18\*\*\* | 0.04 | | -0.32\*\*\* | 0.04 | |
| Reactivity Time X Female | -0.002 | 0.001 | | 0.05 | 0.03 | | 0.14\*\* | 0.05 | | -0.16\*\* | 0.05 | |
| Vaping X Reactivity Time | -0.002 | 0.002 | | -0.04 | 0.04 | | 0.04 | 0.06 | | -0.05 | 0.07 | |
| Vaping X Reactivity Time X Female | 0.000 | 0.002 | | 0.03 | 0.06 | | 0.02 | 0.08 | | 0.07 | 0.10 | |
| Recovery Time | -0.002 | 0.001 | | -0.01\*\* | 0.00 | | -0.03\*\*\* | 0.00 | | 0.05\*\*\* | 0.01 | |
| Recovery Time X Female | 0.000 | 0.001 | | -0.01\* | 0.00 | | -0.02\*\* | 0.01 | | 0.02\*\* | 0.01 | |
| Vaping X Recovery Time | 0.001 | 0.002 | | 0.00 | 0.01 | | -0.01 | 0.01 | | 0.02 | 0.01 | |
| Vaping X Recovery Time X Female | 0.001 | 0.003 | | -0.01 | 0.01 | | 0.00 | 0.01 | | -0.02 | 0.01 | |

*Note*: \**p*< .05, \*\**p* < .01, \*\*\**p* < .001. Poverty status was dummy-coded (0 = below the poverty line, 1 = above the poverty line), female was dummy-coded (0 = male, 1 = female), mother’s education was grand-mean centered, grade was centered at the 10th grade, vaping was dummy-coded (0 = never used by 16, 1 = used by age 16), reactivity time was coded as number of minutes before peak level, and recovery time was coded as number of minutes following peak level. Coefficients and standard errors are reported to the thousandths place for models predicting cortisol when the magnitude of the estimate is < 0.01.

*Figure S1*. Flowchart of study retention.

Cohort 1 Cohort 2

Pregnancy

*N* = 601

TSST = Trier Social Stress Test. As part of the age 14 assessment, a subset of participants had the option to complete the TSST. Because of funding limitations, recruitment was primarily limited to participants in Cohort 1; this cohort was selected because they were in the study for longer, such that models could potentially test how aspects of early life relate to stress responses and psychobiology at age 14. Also, the task can be stressful and may reduce interest in continuing subsequent assessments, but this seemed particularly unlikely for participants from the first cohort who have experienced several assessments already. Inclusion criteria were imposed after initially testing the protocol, such that not all participants were eligible to complete the TSST. All participants, regardless of TSST participation or eligibility, were eligible for subsequent assessments in this ongoing study.

Delivery

*N* = 537

6 Months Old

*N* = 433

1 Year Old

*N* = 441

2 Years Old

*N* = 414

7 Years Old

*N* = 350

5 Years Old

*N* = 350

14 Years Old

*N* = 350

12 Years Old

*N* = 350

9 Years Old

*N* = 350

14 Years Old

TSST *N* = 261

14 Years Old

TSST *N* = 16

14 Years Old

*N* = 286

12 Years Old

*N* = 288

9 Years Old

*N* = 305

10.5 Years Old

*N* = 350

10.5 Years Old

*N* = 295

16 Years Old

*N* = 350

16 Years Old

*N* = 350

*Figure S2*. Cortisol as a function of time.

*Figure S3*. Emotion as a function of time.

*Figure S4*. Cortisol reactivity and recovery as a function of time and use of alcohol by age 14 (a) and vaping nicotine by age 16 (b) among youth below the poverty line.