Supplemental Material

Supplemental material included details for sAA assaying processes, descriptive information on raw sAA levels around the interparental conflict discussion task, and results after controlling for maternal sAA baseline level and child compliance as additional covariates. In addition, we included information for testing differential susceptibility following Roisman et al. (2012) recommendation for the detected family instability-x-sAA reactivity interaction forecasting maternal sensitivity in (a) forbidden toy; and (b) discipline discussion tasks.

**sAA assaying processes**

To control for the diurnal pattern of sAA, all family visits were scheduled in the afternoon (between 13:00-18:00) (See Table S1). Salivettes were labeled and stored at -20°C until batch analysis at the end of data collection at the Laboratory of Biological Health Psychology (Brandeis University, Waltham, MA). Saliva was first centrifuged at 2000g for five minutes, followed by sAA measurement via an enzyme kinetic method (Rohleder & Nater, 2009). Saliva was diluted at 1:625 with ultrapure water, and then incubated with substrate reagent (alpha-amylase EPS Sys; Roche Diagnostics, Indianapolis, IN) at 37°C for 3 minutes. The first absorbance reading was taken at 405 nm with a Tecan Sunrise ELISA reader (Tecan, Morrisville, NC), and the second reading was taken after 5 minutes incubation at 37°C and increase in absorbance was transformed to sAA concentration (unit per milliliter) using “Calibrator f.a.s.”solution (Roche Diagnostics) as a standard. Inter- and intra-assay coefficients of variation were less than 10%.

**Roisman et al. (2012) Test for Maternal Sensitivity during Forbidden Toy Task**

Turning to the details of Roisman et al. (2012) test, as a reminder, the actual range of the standardized family instability was between [-1.29, 2.09]; all following analyses were thus performed with the available range for family instability (see example in Skibo, Sturge-Apple, & Suor, 2020). Regions of significance test (RoS on X) indicated that the association between maternal sAA reactivity was significant below the standardized family instability X= -1.09 and above X= +1.80 (gray-color shading in manuscript Figure 2). Proportion of interaction (PoI), expected to fell within the range of 0.20 to 0.80 to support for differential susceptibility (Del Giudice, 2017), turned out to be 0.42 within the actual range. Finally, percentage above (PA), reflecting the proportion of mothers showing “for better” pattern (i.e., fell in the left side of Figure 2, lower family instability 🡪 greater increases in maternal sensitivity over time), equaled to 0.54 and thus supported differential susceptibility (i.e., PA > 16% indicated differential susceptibility; Roisman et al., 2012). Taken together, all three tests suggested that the interaction pattern aligns with differential susceptibility.

**Roisman et al. (2012) Test for Maternal Sensitivity during Discipline Discussion Task**

As shown in manuscript Figure 3, RoS on X test indicated that the association between sAA reactivity and the change in child externalizing problems were significant on the standardized family instability X < -1.61 and X > 11.31, both fell outside the possible range of family instability measured in this study. Second, PoI and PA tests equaled 0.49 and 0.54, respectively, suggesting the interaction being consistent with the “for-better-and-for-worse” pattern. Despite the PoI and PA tests, however, no significant regions emerged from the RoS on X test.

Table S1. Raw sAA values around the interparental conflict discussion task.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Before Discussion | Post  Discussion | Post-Discussion (20min) | Post-Discussion (40 min) |
| *N* | 228 | 222 | 224 | 225 |
| *Mean* | 74.58 | 80.04 | 73.22 | 72.40 |
| *SD* | 63.98 | 64.54 | 56.10 | 58.23 |
| *Min* | 1.63 | 1.50 | 0.99 | 1.24 |
| *Max* | 351.81 | 305.39 | 271.04 | 291.62 |
| Pair-sample comparison | Before < Post: *t* = -2.70, *p* <.01 | |  | |
| Pair-sample comparison |  | Post > Post-20: *t* = 2.47, *p* =.01 | |  |
| Pair-sample comparison |  |  | Post-20 = Post-40: *t* = 0.64, *p* =.53 | |

*Note*. Discussion: interparental conflict discussion task. (a) Raw sAA level after discussion was significantly greater than its level before discussion (*t* = -2.70, *p* <.01), indicating the conflict discussion was successful in evoking mothers’ sAA reactivity. Averaged percentage change in raw sAA levels before- vs. Post-discussion: (80.04-74.58)/74.58\*100%=7.32%. (b) sAA level immediately Post-discussion was significantly higher than that of post-discussion 20 mins (*t* = 2.47, *p* =.01), suggesting that the sAA increase in response to the conflict discussion (i.e., Post-discussion) was not simply due to diurnal sAA increase over time. (c) Furthermore, we did not find significant differences in sAA levels between the Post-20 vs. Post-40 samples, providing further support that sAA differences around the conflict discussion might not be attributed to diurnal sAA changes.

Table S2. Pathway coefficients for model predicting child behavioral problems *controlling for baseline sAA* (*N* = 235).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *B(SE)* | *β* | *Z* | *p* |
| **Maternal Sensitivity@ Forbidden toy** | | | | |
| **Change in Maternal sensitivity Wave 1-2** |  |  |  |  |
| Wave 1 Maternal Sensitivity | -0.63(0.07) | -0.58 | -9.01 | <.01 |
| Family Instability | **-0.26(0.12)** | **-0.13** | **-2.15** | **.03** |
| Maternal sAA Reactivity | 0.05(0.11) | 0.02 | 0.43 | .67 |
| Family Instability-x-sAA Reactivity Interaction | **-0.22(0.09)** | **-0.12** | **-2.54** | **.01** |
| Family Income-to-needs Ratio | 0.36(0.07) | 0.31 | 5.17 | <.01 |
| Baseline sAA | 0.09(0.03) | 0.16 | 2.82 | <.01 |
| **Change in Child Externalizing Problems Wave 1-2** |  |  |  |  |
| Wave 1 Child Externalizing Problems | -0.50(0.14) | -0.38 | -3.55 | <.01 |
| Family Instability | -0.02(0.35) | -0.004 | -0.05 | .96 |
| Maternal sAA Reactivity | -0.07(0.31) | -0.02 | -0.23 | .82 |
| Family Instability-x-sAA Reactivity Interaction | 0.10(0.35) | 0.02 | 0.29 | .77 |
| Family Income-to-needs Ratio | -0.32(0.16) | -0.11 | -2.04 | .04 |
| Baseline sAA | 0.02(0.10) | 0.01 | 0.18 | .86 |
| Change in Maternal Sensitivity Wave 1-2 | **-0.42(0.19)** | **-0.17** | **-2.18** | **.03** |
| **Maternal Sensitivity @ Discipline Discussion** | | | | |
| **Change in Maternal sensitivity Wave 1-2** |  |  |  |  |
| Wave 1 Maternal Sensitivity | -0.73(0.07) |  | -9.94 | <.01 |
| Family Instability | **-0.35(0.13)** |  | **-2.69** | **<.01** |
| Maternal sAA Reactivity | 0.08(0.12) |  | 0.65 | .52 |
| Family Instability-x-sAA Reactivity Interaction | **-0.22(0.11)** |  | **1.99** | **.047** |
| Family Income-to-needs Ratio | 0.47(0.08) |  | 6.05 | <.01 |
| Baseline sAA | 0.08(0.03) |  | 2.62 | <.01 |
| **Change in Child Externalizing Problems Wave 1-2** |  |  |  |  |
| Wave 1 Child Externalizing Problems | -0.51(0.14) |  | -3.61 | <.01 |
| Family Instability | -0.01(0.36) |  | -0.02 | .99 |
| Maternal sAA Reactivity | -0.08(0.30) |  | -0.25 | .80 |
| Family Instability-x-sAA Reactivity Interaction | 0.14(0.36) |  | 0.38 | .71 |
| Family Income-to-needs Ratio | -0.32(0.16) |  | -2.00 | .045 |
| Baseline sAA | -0.004(0.10) |  | -0.05 | .96 |
| Change in Maternal Sensitivity Wave 1-2 | -0.30(0.19) |  | -1.61 | .11 |

Note. For maternal sensitivity during *forbidden toy* task: mothers with greater sAA reactivity exhibited significant association between greater family instability and greater decrease in sensitivity over time (*B* = -0.48, *p* < .01). In contrast, mothers with low sAA reactivity did not show this association (*B* = -0.03, *p* =.83). For maternal sensitivity during *discipline discussion* task: greater family instability was linked to more decrease in maternal sensitivity for mothers with greater sAA reactivity (*B* = -0.57, *p* < .01), but not those with lower sAA reactivity (*B* = -0.13, *p* = .49).

Table S3. Pathway coefficients for model predicting child behavioral problems *controlling for baseline sAA and observed child compliance in the corresponding task* (*N* = 235).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *B(SE)* | *β* | *Z* | *p* |
| **Maternal Sensitivity@ Forbidden toy** | | | | |
| **Change in Maternal sensitivity Wave 1-2** |  |  |  |  |
| Wave 1 Maternal Sensitivity | -0.61(0.07) | -0.56 | -8.33 | <.01 |
| Family Instability | **-0.26(0.12)** | **-0.13** | **-2.23** | **.03** |
| Maternal sAA Reactivity | 0.05(0.12) | 0.02 | 0.41 | .68 |
| Family Instability-x-sAA Reactivity Interaction | **-0.22(0.09)** | **-0.13** | **-2.45** | **.01** |
| Family Income-to-needs Ratio | 0.36(0.07) | 0.31 | 5.27 | <.01 |
| Baseline sAA | 0.09(0.03) | 0.16 | 2.88 | <.01 |
| Child Compliance | -0.08(0.05) | -0.09 | -1.69 | .09 |
| **Change in Child Externalizing Problems Wave 1-2** |  |  |  |  |
| Wave 1 Child Externalizing Problems | -0.63(0.15) | -0.48 | -4.28 | <.01 |
| Family Instability | -0.12(0.33) | -0.03 | -0.37 | .71 |
| Maternal sAA Reactivity | -0.04(0.31) | -0.01 | -0.13 | .90 |
| Family Instability-x-sAA Reactivity Interaction | 0.08(0.32) | 0.02 | 0.24 | .81 |
| Family Income-to-needs Ratio | -0.25(0.15) | -0.09 | -1.62 | .11 |
| Baseline sAA | 0.02(0.10) | 0.01 | 0.18 | .86 |
| Child Compliance | -0.61(0.19) | -0.29 | -3.27 | <.01 |
| Change in Maternal Sensitivity Wave 1-2 | **-0.53(0.19)** | **-0.22** | **-2.84** | **<.01** |
| **Maternal Sensitivity @ Discipline Discussion** | | | | |
| **Change in Maternal sensitivity Wave 1-2** |  |  |  |  |
| Wave 1 Maternal Sensitivity | -0.73(0.08) | -0.61 | -9.53 | <.01 |
| Family Instability | **-0.35(0.13)** | **-0.16** | **-2.67** | **<.01** |
| Maternal sAA Reactivity | 0.08(0.12) | 0.04 | 0.65 | .52 |
| Family Instability-x-sAA Reactivity Interaction | **-0.22(0.11)** | **-0.11** | **-1.92** | **.06** |
| Family Income-to-needs Ratio | 0.46(0.08) | 0.36 | 5.62 | <.01 |
| Baseline sAA | 0.08(0.03) | 0.13 | 2.62 | <.01 |
| Child Compliance | 0.01(0.04) | 0.01 | 0.25 | .80 |
| **Change in Child Externalizing Problems Wave 1-2** |  |  |  |  |
| Wave 1 Child Externalizing Problems | -0.52(0.15) | -0.39 | -3.53 | <.01 |
| Family Instability | -0.01(0.36) | -0.002 | -0.03 | .98 |
| Maternal sAA Reactivity | -0.08(0.30) | -0.02 | -0.28 | .78 |
| Family Instability-x-sAA Reactivity Interaction | 0.12(0.35) | 0.03 | 0.35 | .73 |
| Family Income-to-needs Ratio | -0.29(0.16) | -0.10 | -1.87 | .06 |
| Baseline sAA | -0.003(0.10) | -0.002 | -0.04 | .97 |
| Child Compliance | -0.11(0.12) | -0.06 | -0.89 | .37 |
| Change in Maternal Sensitivity Wave 1-2 | -0.30(0.19) | -0.13 | -1.61 | .11 |

Note. After controlling for child compliance as an additional covariate: (a) In forbidden toy task: mothers with greater sAA reactivity exhibited significant association between greater family instability and greater decrease in sensitivity over time ((*B* = -0.49, *p* < .01). In contrast, mothers with low sAA reactivity did not show this association (*B* = -0.04, *p* =.81). (b) In discipline discussion task: the interaction between family instability and maternal sAA reactivity was no longer significantly associated with the change in maternal sensitivity over time.