

## Supplemental Information

### VALIDATION OF THE ACE SCORE IN THE PSID

We approached validation of the ACE score within the PSID in 2 distinct ways. First, we sought to confirm that ACEs reported through the PSID's CRCS behaved as they have in previous studies revealing correlations between ACE count and risk of certain adult health conditions. Second, we wanted to verify that retrospectively reported ACEs in the CRCS were not strongly affected by recall bias and were in fact representative of the level of adversity experienced by individual survey participants during childhood. Here we describe steps taken in both PSID ACEs validation approaches.

On the basis of the full CRCS sample of adults for whom we have complete ACEs information (all 9 ACE items described in the Methods section of the main article), we used logistic regression models adjusted for covariates similar to those in our primary analyses (including total household income, participant education, participant age, and participant race and/or ethnicity) to validate relationships between ACEs and individual chronic conditions that have been shown by using other data sets and published in the literature, including statistically significant elevated risk of diabetes, hypertension, heart disease, arthritis, and lung disease. We validated the linear association between ACE score and chronic condition count, with the average number of chronic conditions reported in the 2013 PSID main interview increasing from 0.94 (95% CI: 0.89–0.99) among those with no reported ACEs in our sample to 1.28 (95% CI: 1.2–1.36) among those with

3 or more ACEs. Similarly, we found through negative binomial regression models that the average number of nights hospitalized per year reported in the 2011 and 2013 PSID interview waves was 0.59 hospital nights higher in the group with 3 or more ACEs compared with those with 0 reported ACEs (1.37 [95% CI: 1.01–1.73] compared with 0.78 [95% CI: 0.59–0.98]). These findings revealed that our PSID CRCS ACE score tracked with adult health outcomes similar to other ACE scores in the published literature.

The second validation we undertook was designed to address the possibility of recall bias due to the retrospective nature of ACE measurement. The longitudinal, genealogical nature of PSID allowed us to identify a subsample of 660 adult CRCS participants who had been child subjects in the 1997–2007 PSID CDS, which assessed the Kessler-6 Emotional Distress Scale and APS of these children's primary parental caregivers as well as the Home Observation Measurement of the Environment scale measured by in-person interviewers. We compared the retrospectively reported ACE scores from the CRCS to these contemporaneously reported measures from the CDS of childhood stress and adversity, such as parent mental health issues, emotional distress, and aggravation, that would all increase the likelihood of child maltreatment and household dysfunction as captured in the CRCS ACE scores. We found statistically significant correlations between the CRCS participants' retrospectively reported ACEs and their parents' concurrently reported Kessler-6 scores, APS, and Home Observation Measurement of the Environment

scale in CDS (A.S., N.H., N.S., P.C., unpublished data). This increased our confidence that the PSID CRCS ACEs score we developed was able to reliably assess childhood adversity.

**SUPPLEMENTAL TABLE 6** The BPI

For the Next Set of Statements, Decide Whether They Are Not True, Sometimes True, or Often True of Your Child's Behavior. He or She...	Externalizing Behavior Subscale	Internalizing Behavior Subscale
1 ...has sudden changes in mood or feeling.	X	—
2 ...feels or complains that no one loves him or her.	—	X
3 ...is rather high strung, tense, and nervous.	X	X
4 ...cheats or tells lies.	X	—
5 ...is too fearful or anxious.	—	X
6 ...argues too much.	X	—
7 ...has difficulty concentrating and cannot pay attention for long.	X	—
8 ...is easily confused and seems to be in a fog.	—	X
9 ...bullies or is cruel or mean to others.	X	—
10 ...is disobedient.	X	—
11 ...does not seem to feel sorry after he or she misbehaves.	X	—
12 ...has trouble getting along with other people his or her age.	X	X
13 ...is impulsive or acts without thinking.	X	—
14 ...feels worthless or inferior.	—	X
15 ...is not liked by other people his or her age.	—	X
16 ...has a lot of difficulty getting his or her mind off of certain thoughts.	—	X
17 ...is restless or overly active and cannot sit still.	X	—
18 ...is stubborn, sullen, or irritable.	X	—
19 ...has a strong temper and loses it easily.	X	—
20 ...is unhappy, sad, or depressed.	—	X
21 ...is withdrawn and does not get involved with others.	—	X
22 ...breaks things on purpose or deliberately destroys his or her own or another's things.	X	—
23 ...clings to adults.	—	—
24 ...cries too much.	—	X
25 ...demands a lot of attention.	X	—
26 ...is too dependent on others.	—	X
27 ...feels others are out to get him or her.	—	X
28 ...hangs around with kids who get into trouble.	—	—
29 ...is secretive and keeps things to himself or herself.	—	—
30 ...worries too much.	—	X
31 ...is disobedient at school.	X	—
32 ...has trouble getting along with teachers.	X	—
No. items	17	14
Cronbach's $\alpha$	0.88	0.84

X, indicates selected subscale; —, not applicable.

**SUPPLEMENTAL TABLE 7** The PBS

Thinking About Your Child, Please Tell Me How Much Each Statement Applies to Him or Her on a Scale From 1 to 5 in Which 1 Means Not at All Like Your Child and 5 Means Totally Like Your Child. He or She...

1 ...is cheerful and happy
2 ...waits for his or her turn in games and other activities
3 ...does neat, careful work
4 ...is curious and likes exploring and new experiences
5 ...thinks before he or she acts and is not impulsive
6 ...gets along well with other children
7 ...usually does what you tell him or her to do
8 ...can get over being upset quickly
9 ...is admired and well liked by other children
10 ...tries to do things for himself or herself and is self-reliant

**SUPPLEMENTAL TABLE 8** Analyses of Associations Between Parent ACE Scores and Child Health Status and Obesity

Child Health Outcome Measure or Condition	Higher of Either Parent's ACE Count			
	0 ACEs	1 ACE	2–3 ACEs	4 Or More ACEs
(aOR, <i>n</i> = 2564)				
Obesity	Ref	0.84 (0.5 to 1.5)	0.85 (0.5 to 1.5)	1.23 (0.7 to 2.2)
(Adjusted linear regression coefficients, <i>n</i> = 2316)				
Overall child health (parent-rated)	Ref	−0.07 (−0.2 to 0.3)	0.07 (−0.03 to 0.2)	−0.03 (−0.1 to 0.1)

**SUPPLEMENTAL TABLE 9** Mediation Regression Analyses: Effect of Including Primary Caregiver Mental Health Scale (Kessler-6 Emotional Distress Score) and APS as Mediators of Parents' ACEs Impact on Children's Behavioral Outcomes

Child Behavioral Outcome Measure or Condition ( <i>n</i> = 1979 Children With Data Available on All Parents' ACE Scores [95% CI])	Primary Caregiver ACE Count			
	0 ACEs	1 ACE	2–3 ACEs	4 Or More ACEs
Original model without mediator variables aORs or adjusted linear coefficient				
Hyperactivity, aOR	Ref	1.39 (0.8 to 2.6)	1.37 (0.8 to 2.4)	2.02 (1.1 to 3.7) <sup>a</sup>
Emotional or mental disturbance, aOR	Ref	1.51 (0.6 to 4.0)	1.52 (0.6 to 4.0)	4.02 (1.6 to 10.4) <sup>b</sup>
BPI: total score, adjusted linear coefficient	Ref	0.25 (−0.6 to 1.1)	1.89 (1.0 to 2.7) <sup>c</sup>	2.37 (1.4 to 3.3) <sup>c</sup>
Original model plus primary caregiver Kessler-6 emotional distress scale score aOR or adjusted linear coefficient				
Hyperactivity, aOR	Ref	1.33 (0.7 to 2.4)	1.28 (0.7 to 2.2)	1.77 (0.97 to 3.2)
Emotional or mental disturbance, aOR	Ref	1.39 (0.5 to 3.7)	1.31 (0.5 to 3.4)	2.92 (1.1 to 7.5) <sup>a</sup>
BPI: total score, adjusted linear coefficient	Ref	−0.1 (−0.9 to 0.7)	1.29 (0.5 to 2.1) <sup>b</sup>	1.45 (0.6 to 2.4) <sup>b</sup>
Original model plus primary caregiver aggravation in parenting score aOR or adjusted linear coefficient				
Hyperactivity, aOR	Ref	1.41 (0.8 to 2.6)	1.28 (0.7 to 2.2)	1.85 (1.0 to 3.4) <sup>a</sup>
Emotional or mental disturbance, aOR	Ref	1.51 (0.6 to 4.1)	1.44 (0.6 to 3.7)	3.91 (1.5 to 10.4) <sup>b</sup>
BPI: total score, adjusted linear coefficient	Ref	0.20 (−0.6 to 1.0)	1.49 (0.7 to 2.3) <sup>c</sup>	1.96 (1.1 to 2.8) <sup>c</sup>

<sup>a</sup> Indicates statistically significant result at  $\alpha < .05$  threshold.<sup>b</sup> Indicates statistically significant result at  $\alpha < .01$  threshold.<sup>c</sup> Indicates statistically significant result at  $\alpha < .001$  threshold.

**SUPPLEMENTAL TABLE 10** Differences in Child Behavioral Health Problems and Conditions by Parent’s ACE Count, Doubly Robust Treatment Effects Models ( $n = 2005$ )

Child Behavioral Outcome Measure or Condition	Mother or Father’s ACE Count Mean Risk or Score for Referent and Average Treatment Effects (95% CI)			
	0 ACEs	1 ACE	2–3 ACEs	4 Or More ACEs
Mother’s ACE count mean risk or score for referent and average treatment effects				
Behavioral conditions reported to parents by a clinician (mean rate for referent and average change in rate)				
Hyperactivity	Referent group rate 0.08 (0.05 to 0.10)	0.01 (–0.03 to 0.04)	–0.01 (–0.04 to 0.03)	0.06 (0.01 to 0.11) <sup>a</sup>
Emotional or mental disturbance	Referent group rate 0.02 (0.01 to 0.03)	0.004 (–0.01 to 0.02)	0.01 (–0.01 to 0.03)	0.04 (0.005 to 0.07) <sup>a</sup>
Behavior scales (mean score for referent and average change in score)				
BPI: total score	Referent group mean 5.66 (5.2 to 6.1)	0.41 (–0.2 to 1.1)	2.15 (1.5 to 2.8) <sup>b</sup>	2.95 (2.0 to 3.9) <sup>b</sup>
BPI: externalizing behaviors score	Referent group mean 4.20 (3.9 to 4.5)	0.25 (–0.2 to 0.8)	1.37 (0.9 to 1.9) <sup>b</sup>	1.95 (1.3 to 2.6) <sup>b</sup>
BPI: internalizing behaviors score	Referent group mean 1.89 (1.6 to 2.1)	0.20 (–0.1 to 0.5)	0.84 (0.5 to 1.2) <sup>b</sup>	1.38 (0.9 to 1.9) <sup>b</sup>
PBS	Referent group mean 4.27 (4.2 to 4.3)	–0.07 (–0.2 to –0.04)	–0.14 (–0.2 to –0.04) <sup>c</sup>	–0.17 (–0.3 to –0.04) <sup>c</sup>
Father’s ACE count mean risk or score for referent and average treatment effects				
Behavioral conditions reported to parents by a clinician (mean rate for referent and average change in rate)				
Hyperactivity	Referent group rate 0.05 (0.03 to 0.07)	0.02 (–0.02 to 0.05)	0.01 (–0.03 to 0.04)	0.05 (–0.01 to 0.10)
Emotional or mental disturbance	Referent group rate 0.01 (0.003 to 0.02)	0.02 (–0.003 to 0.03)	0.01 (–0.01 to 0.03)	0.05 (0.01 to 0.09) <sup>a</sup>
Behavior scales (mean score for referent and average change in score)				
BPI: total score	Referent group mean 5.97 (5.5 to 6.4)	0.87 (0.1 to 1.6) <sup>a</sup>	1.16 (0.3 to 2.0) <sup>c</sup>	0.62 (–0.5 to 1.8)
BPI: externalizing behaviors score	Referent group mean 4.40 (4.1 to 4.8)	0.64 (0.1 to 1.2) <sup>a</sup>	0.75 (0.2 to 1.3) <sup>a</sup>	0.61 (–0.2 to 1.4)
BPI: internalizing behaviors score	Referent group mean 1.94 (1.7 to 2.2)	0.28 (–0.1 to 0.7)	0.66 (0.2 to 1.1) <sup>c</sup>	0.68 (0.8 to 1.3) <sup>a</sup>

<sup>a</sup> Indicates significant difference from referent group with  $P$  value < .05.

<sup>b</sup> Indicates significant difference from referent group with  $P$  value < .001.

<sup>c</sup> Indicates significant difference from referent group with  $P$  value < .01.