

**Supplemental Material for:**

**Title:** Identifying periods of heightened susceptibility to lead exposure in relation to behavioral problems

**Authors:** Clara G. Sears <sup>1,2</sup>, Bruce P. Lanphear <sup>3</sup>, Yingying Xu <sup>4</sup>, Aimin Chen <sup>5</sup>, Kimberly Yolton <sup>6</sup>, Joseph M. Braun<sup>1</sup>

<sup>1</sup> Department of Epidemiology, Brown University, Providence, RI, USA

<sup>2</sup> Division of Environmental Medicine, Department of Medicine, University of Louisville, Louisville, KY, USA

<sup>3</sup> Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada

<sup>4</sup> Division of General and Community Pediatrics, Cincinnati Children's Hospital, Cincinnati, OH, USA

<sup>5</sup> Department of Biostatistics, Epidemiology and Informatics, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA

<sup>6</sup> Department of Pediatrics, Cincinnati Children's Hospital, University of Cincinnati College of Medicine, Cincinnati, OH, USA

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**Table S1.** BASC-2 scores among HOME Study children (n=244; 918 repeats)

BASC-2 Scale	Mean (SD) of BASC-2 Scores at Ages						ICC <sup>a</sup>
	Total n=244	2 Y n= 222	3 Y n= 210	4 Y n= 151	5Y n= 164	8Y n= 171	
Adaptive Skills	49.0 (9.2)	42.0 (6.6)	51.0 (7.4)	50.3 (8.7)	53.1 (9.1)	50.5 (9.7)	0.48
Behavioral Symptom Index	49.4 (8.5)	50.4 (6.5)	50.4 (9.1)	48.5 (8.0)	47.2 (9.5)	49.6 (9.2)	0.59
Internalizing Problems	47.3 (9.0)	45.1 (6.9)	50.3 (10.2)	47.0 (8.3)	45.8 (9.7)	48.3 (8.8)	0.54
Externalizing Problems	48.6 (8.9)	47.6 (7.1)	49.7 (9.6)	48.9 (8.3)	47.1 (9.4)	49.8 (9.7)	0.57
Hyperactivity	49.7 (9.2)	49.7 (8.3)	50.9 (9.3)	49.5 (8.3)	47.6 (9.7)	50.5 (10.0)	0.53
Aggression	47.8 (9.0)	46.0 (7.0)	48.5 (10.3)	48.5 (8.9)	47.1 (9.2)	49.3 (9.2)	0.52
Conduct	49.9 (10.5)	-	-	-	-	49.9 (10.5)	-
<b>Females</b>	n=132	n= 119	n= 113	n= 84	n= 89	n= 94	
Adaptive Skills	50.8 (8.9)	43.1 (6.5)	53.1 (7.1)	52.0 (7.6)	54.7 (8.5)	53.0 (9.4)	0.41
Behavioral Symptom Index	48.5 (8.6)	49.5 (6.4)	49.8 (9.3)	47.4 (7.6)	46.8 (10.1)	48.2 (9.1)	0.64
Internalizing Problems	48.0 (9.5)	45.3 (7.1)	51.3 (11.3)	47.7 (7.8)	47.0 (10.8)	48.8 (8.9)	0.54
Externalizing Problems	47.5 (8.9)	46.6 (7.3)	49.1 (9.9)	47.3 (7.6)	46.4 (10.3)	47.9 (9.2)	0.63
Hyperactivity	48.4 (9.0)	48.2 (8.2)	49.9 (9.2)	47.9 (7.6)	46.8 (10.1)	48.8 (9.7)	0.53
Aggression	47.1 (9.3)	45.6 (7.5)	48.5 (10.7)	47.3 (8.2)	46.7 (10.4)	47.8 (9.0)	0.60
Conduct	48.0 (9.8)	-	-	-	-	48.0 (9.8)	-
<b>Males</b>	n= 112	n= 103	n= 97	n= 67	n= 75	n= 77	
Adaptive Skills	46.9 (9.0)	40.8 (6.4)	48.7 (7.2)	48.3 (9.4)	51.3 (9.4)	47.5 (9.3)	0.50
Behavioral Symptom Index	50.5 (8.3)	51.5 (6.4)	51.1 (8.8)	49.9 (8.3)	47.8 (8.7)	51.4 (9.1)	0.52
Internalizing Problems	46.5 (8.3)	45.0 (6.6)	49.2 (8.7)	46.2 (8.9)	44.4 (8.2)	47.6 (8.6)	0.54
Externalizing Problems	49.9 (8.6)	48.8 (6.7)	50.3 (9.3)	50.9 (8.8)	47.9 (8.2)	52.1 (9.8)	0.48
Hyperactivity	51.3 (9.1)	51.5 (8.1)	52.0 (9.3)	51.6 (8.8)	48.7 (9.1)	52.7 (10.0)	0.51
Aggression	48.6 (8.6)	46.4 (6.3)	48.6 (10.0)	50.1 (9.4)	47.6 (7.5)	51.1 (9.2)	0.40
Conduct	52.1 (10.9)	-	-	-	-	52.0 (10.9)	

<sup>a</sup> Between-child and within-child variance was calculated using linear mixed models with an unstructured correlation matrix and a fixed linear effect for child age. ICC= Intraclass correlation coefficient is the ratio of the between-person variation to the sum of the between- and within-person variation.

**Table S2.** Participant characteristics at baseline (first observation) and eight-year visit.

<b>Characteristic</b>	<b>Baseline (%)</b>	<b>Eight Year Visit (%)</b>
Total	244	147
Child Sex		
Male	112 (46)	69 (47)
Female	132 (54)	78 (53)
Maternal Race/Ethnicity		
non-Hispanic White	189 (77)	106 (72)
non-Hispanic Black	55 (23)	41 (28)
Intervention		
Injury Prevention	125 (51)	75 (51)
Lead Hazard	119 (49)	72 (49)
Maternal Education		
High School or Less	37 (15)	24 (16)
Some College	59 (24)	45 (31)
College Graduate	148 (61)	78 (53)
Household Income		
< \$45,000	70 (29)	49 (33)
\$45,000- 75,000	92 (38)	53 (36)
>\$75,000	82 (33)	45 (31)
Child's Average Serum Cotinine (ng/mL)		
<0.02	61 (25)	31 (21)
0.02 to 0.22	123 (50)	74 (50)
>0.22	60 (25)	42 (29)
Year Housing Unit Built		
=<1924	76 (31)	49 (34)
>1924 to 1955	97 (40)	57 (39)
>1955 - 1978	70 (29)	40 (27)
Residential Ownership		
No	61 (25)	43 (29)
Yes	182 (75)	103 (71)
Move between ages 1, 2, 3 years		
No	167 (69)	91 (62)
Yes	75 (31)	55 (38)

**Table S3.** Adjusted difference in BASC-2 Composite Scales at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentration.

BASC-2 Composite Scale	Exposure Period (years)	Age-adjusted		Fully-adjusted	
		$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p
Adaptive Skills			0.48		0.22
	1	-1.0 (-2.7, 0.6)		-0.3 (-1.8, 1.3)	
	2	-0.3 (-2.1, 1.5)		0.8 (-0.8, 2.5)	
	3	-1.4 (-3.5, 0.6)		-0.2 (-2.0, 1.5)	
	4	-1.2 (-3.8, 1.3)		0.1 (-2.3, 2.5)	
	5	-1.8 (-4.7, 1.1)		-0.5 (-3.3, 2.3)	
Behavioral Symptom Index (BSI)	8	-3.1 (-6.0, -0.2)		-2.2 (-4.9, 0.5)	
			0.44		0.45
	1	1.0 (-0.4, 2.5)		0.3 (-1.3, 1.9)	
	2	1.3 (-0.5, 3.0)		0.3 (-1.3, 2.0)	
	3	2.2 (0.5, 3.8)		1.1 (-0.6, 2.8)	
	4	2.0 (0.0, 4.1)		1.0 (-1.1, 3.1)	
Externalizing Problems	5	2.3 (-0.3, 4.9)		1.4 (-1.3, 4.1)	
	8	3.3 (0.9, 5.6)		2.5 (0.1, 4.9)	
			0.24		0.20
	1	1.1 (-0.5, 2.6)		0.6 (-1.0, 2.1)	
	2	1.6 (-0.1, 3.3)		0.9 (-0.6, 2.5)	
	3	2.5 (0.8, 4.3)		1.8 (0.1, 3.4)	
Internalizing Problems	4	1.6 (-0.4, 3.6)		0.9 (-1.1, 2.9)	
	5	2.2 (-0.2, 4.5)		1.6 (-0.8, 4.1)	
	8	3.6 (1.2, 6.0)		3.1 (0.7, 5.4)	
			0.91		0.89
	1	0.7 (-0.8, 2.2)		0.5 (-1.1, 2.1)	
	2	0.6 (-1.2, 2.4)		0.5 (-1.1, 2.2)	
	3	0.4 (-1.5, 2.2)		0.1 (-1.7, 1.9)	
	4	0.4 (-1.7, 2.6)		0.5 (-1.6, 2.5)	
	5	0.4 (-2.0, 2.8)		0.6 (-1.8, 2.9)	
	8	1.6 (-0.4, 3.5)		1.3 (-0.6, 3.3)	

Age-adjusted model includes child's age (continuous) as covariate. Fully-adjusted includes child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine.

Total participants = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171).

Heterogeneity p-values included to indicate difference in associations by exposure timing.

**Table S4.** Adjusted difference in Externalizing Problems subscales at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentration.

Externalizing Problems Subscale	Exposure Period (years)	Age-adjusted		Fully-adjusted	
		$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p
Hyperactivity			0.25		0.25
	1	0.8 (-0.8, 2.4)		0.3 (-1.3, 2.0)	
	2	1.6 (-0.1, 3.3)		0.9 (-0.7, 2.6)	
	3	2.4 (0.8, 4.0)		1.7 (0.1, 3.3)	
	4	1.9 (-0.2, 3.9)		1.2 (-0.8, 3.3)	
	5	2.4 (0.0, 4.8)		2.0 (-0.6, 4.5)	
Aggression	8	3.7 (1.1, 6.4)		3.2 (0.6, 5.8)	
			0.63		0.68
	1	1.1 (-0.4, 2.7)		0.9 (-0.6, 2.5)	
	2	1.2 (-0.4, 2.8)		0.9 (-0.7, 2.4)	
	3	2.1 (0.3, 3.9)		1.7 (-0.1, 3.4)	
	4	0.9 (-1.1, 2.8)		0.6 (-1.4, 2.5)	
Conduct <sup>a</sup>	5	1.4 (-0.9, 3.8)		1.2 (-1.2, 3.7)	
	8	2.1 (-0.1, 4.3)		1.9 (-0.3, 4.1)	
			0.97		0.63
	1	3.2 (0.2, 6.1)		1.7 (-1.0, 4.5)	
	2	3.1 (0.5, 5.6)		1.4 (-0.9, 3.7)	
	3	3.6 (1.0, 6.3)		1.7 (-0.7, 4.0)	
	4	3.1 (-0.1, 6.3)		1.0 (-2.1, 4.0)	
	5	3.3 (0.2, 6.4)		1.6 (-1.6, 4.8)	
	8	4.0 (1.4, 6.6)		2.8 (0.6, 5.1)	

Age-adjusted model includes child's age (continuous) as covariate. Fully-adjusted includes child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine.

Total participants for Hyperactivity and Aggression subscales = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171).

<sup>a</sup> Conduct subscale assessed only at age 8 years: Total participants = 147.

Heterogeneity p-values included to indicate difference in associations by exposure timing.

**Table S5.** Analyses of the sex-differences in periods of susceptibility to lead and the relations of blood lead concentrations with BASC-2 scores.

BASC- 2 Composite Scale or Subscale	<b>Multiple Informant with GEE</b>	<b>Modified Poisson</b>
	<b>Models</b>	<b>Regression Models</b>
	Sex*lead*exposure age interaction p-value	Sex*lead Interaction p-value
Adaptive Skills	0.02	0.50
Behavioral Symptom Index (BSI)	0.29	0.59
Internalizing	0.94	0.86
Externalizing	0.66	0.66
<i>Hyperactivity</i>	0.40	0.94
<i>Aggression</i>	0.58	0.19
<i>Conduct</i>	0.98	0.76

Models adjusted for child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine.  
Multiple Informant with GEE models also includes lead by exposure period, sex by exposure period, and lead by sex two-way product terms.

**Table S6.** Adjusted difference in BASC-2 Composite Scales at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentration from sensitivity analyses adjusting for cotinine measures.

BASC-2 Composite Scale	Exposure Period (years)	Main Results: Adjusting for Child cotinine		Sensitivity Analysis 1: Adjusting for Maternal Cotinine		Sensitivity Analysis 2: Adjusting for Maternal and Child Cotinine	
		$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p
Adaptive Skills			0.22		0.24		0.19
	1	-0.3 (-1.8, 1.3)		-0.7 (-2.3, 0.9)		-0.3 (-1.9, 1.3)	
	2	0.8 (-0.8, 2.5)		0.3 (-1.4, 1.9)		0.7 (-0.9, 2.4)	
	3	-0.2 (-2.0, 1.5)		-1.0 (-2.8, 0.8)		-0.5 (-2.3, 1.2)	
	4	0.1 (-2.3, 2.5)		-0.6 (-3.1, 1.8)		-0.1 (-2.5, 2.3)	
	5	-0.5 (-3.3, 2.3)		-1.2 (-4.0, 1.6)		-0.7 (-3.5, 2.0)	
Behavioral Symptom Index (BSI)	8	-2.2 (-4.9, 0.5)		-3.0 (-5.7, -0.2)		-2.5 (-5.1, 0.2)	
			0.45		0.32		0.32
	1	0.3 (-1.3, 1.9)		0.3 (-1.2, 1.9)		0.3 (-1.3, 1.9)	
	2	0.3 (-1.3, 2.0)		0.5 (-1.2, 2.1)		0.4 (-1.3, 2.1)	
	3	1.1 (-0.6, 2.8)		1.4 (-0.3, 3.0)		1.3 (-0.4, 3.0)	
	4	1.0 (-1.1, 3.1)		1.2 (-0.9, 3.2)		1.1 (-1.0, 3.2)	
Externalizing Problems	5	1.4 (-1.3, 4.1)		1.6 (-1.0, 4.2)		1.6 (-1.1, 4.2)	
	8	2.5 (0.1, 4.9)		2.7 (0.4, 5.0)		2.6 (0.3, 5.0)	
			0.20		0.17		0.17
	1	0.6 (-1.0, 2.1)		0.6 (-1.0, 2.1)		0.6 (-1.0, 2.2)	
	2	0.9 (-0.6, 2.5)		1.0 (-0.6, 2.5)		0.9 (-0.6, 2.5)	
	3	1.8 (0.1, 3.4)		1.9 (0.2, 3.5)		1.8 (0.2, 3.5)	
Internalizing Problems	4	0.9 (-1.1, 2.9)		1.0 (-1.0, 2.9)		0.9 (-1.1, 3.0)	
	5	1.6 (-0.8, 4.1)		1.7 (-0.7, 4.1)		1.7 (-0.8, 4.2)	
	8	3.1 (0.7, 5.4)		3.2 (0.9, 5.4)		3.1 (0.8, 5.4)	
			0.89		0.91		0.91
	1	0.5 (-1.1, 2.1)		0.5 (-1.1, 2.0)		0.5 (-1.1, 2.1)	
	2	0.5 (-1.1, 2.2)		0.5 (-1.1, 2.2)		0.6 (-1.0, 2.3)	
	3	0.1 (-1.7, 1.9)		0.3 (-1.5, 2.0)		0.3 (-1.5, 2.1)	
	4	0.5 (-1.6, 2.5)		0.5 (-1.6, 2.6)		0.6 (-1.5, 2.6)	
	5	0.6 (-1.8, 2.9)		0.7 (-1.7, 3.0)		0.7 (-1.6, 3.1)	
	8	1.3 (-0.6, 3.3)		1.4 (-0.5, 3.4)		1.5 (-0.4, 3.4)	

Main adjusted model includes child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine. Sensitivity Analysis 1 includes maternal serum cotinine instead of child's serum cotinine. Sensitivity Analysis 2 adjusts for both maternal and child serum cotinine.

Total participants = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171).

Heterogeneity p-values included to indicate difference in associations by exposure timing.



**Table S7.** Adjusted relative risk of BASC-2 scores classified as at-risk or clinically significant at ages 2, 3, 4, 5, and 8 years per unit increase in In-transformed blood lead concentrations from sensitivity analyses adjusting for cotinine measures.

BASC- 2 Composite Scale or Subscale	Age-adjusted Results	Main Results: Adjusting for Child cotinine	Sensitivity Analysis 1: Adjusting for Maternal Cotinine	Sensitivity Analysis 2: Adjusting for Maternal and Child Cotinine
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Adaptive Skills	1.43 (1.10, 1.87)	1.31 (0.98, 1.80)	1.33 (1.00, 1.76)	1.32 (1.00, 1.77)
Behavioral Symptom Index (BSI)	1.70 (1.22, 2.35)	1.60 (1.03, 2.48)	1.54 (1.04, 2.28)	1.60 (1.05, 2.43)
Internalizing	1.10 (0.69, 1.75)	0.96 (0.53, 1.72)	1.05 (0.58, 1.90)	0.97 (0.56, 1.70)
Externalizing	1.73 (1.19, 2.51)	1.56 (0.95, 2.56)	1.44 (0.83, 2.52)	1.49 (0.82, 2.71)
<i>Hyperactivity</i>	1.47 (1.14, 1.88)	1.48 (1.08, 2.02)	1.47 (1.09, 1.99)	1.51 (1.11, 2.04)
<i>Aggression</i>	1.60 (1.16, 2.20)	1.72 (1.19, 2.51)	1.69 (1.17, 2.46)	1.74 (1.19, 2.53)
<i>Conduct</i>	1.94 (1.04, 3.62)	1.73 (0.97, 3.07)	1.77 (1.07, 2.93)	1.79 (1.03, 3.12)

Age-adjusted models include child's age.

Main adjusted and sensitivity models also include child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms.

Adaptive Skills, BSI, Internalizing, and Externalizing Composite, as well as Hyperactivity and Aggression Subscale models include repeated blood lead concentrations (ages 2-8 years) and repeated BASC-2 score category (participants n=232).

Conduct models include blood lead concentrations at age 8 years and BASC-2 scores at age 8 years only (participants n=147).

At-risk for clinically significant problematic behaviors indicated by Adaptive Skills scores  $\leq 40$ , or BSI, Internalizing, as well as Externalizing composite and subscale scores  $\geq 60$

**Table S8.** Adjusted difference in BASC-2 Composite Scales at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentration from sensitivity analyses adjusting for other covariates.

BASC-2 Composite Scale	Exposure Period (years)	Main Results		Sensitivity Analysis 1: Adjusting for Home Inventory Score		Sensitivity Analysis 2: Adjusting for HOME Inventory Score and Maternal IQ		Sensitivity Analysis 3: Adjusting for Maternal Education Instead of Household Income	
		$\beta$ (95% CI)	p-value	$\beta$ (95% CI)	p-value	$\beta$ (95% CI)	p-value	$\beta$ (95% CI)	p-value
Adaptive Skills			0.22		0.20		0.17		0.23
	1	-0.3 (-1.8, 1.3)		-0.2 (-1.7, 1.4)		-0.2 (-1.8, 1.4)		-0.4 (-1.9, 1.1)	
	2	0.8 (-0.8, 2.5)		0.9 (-0.7, 2.6)		1.0 (-0.6, 2.6)		0.7 (-0.9, 2.2)	
	3	-0.2 (-2.0, 1.5)		-0.1 (-1.9, 1.6)		-0.1 (-1.9, 1.6)		-0.4 (-2.1, 1.3)	
	4	0.1 (-2.3, 2.5)		0.3 (-2.0, 2.5)		0.3 (-2.0, 2.5)		-0.1 (-2.4, 2.2)	
	5	-0.5 (-3.3, 2.3)		-0.4 (-3.1, 2.4)		-0.4 (-3.1, 2.4)		-0.8 (-3.5, 2.0)	
	8	-2.2 (-4.9, 0.5)		-2.1 (-4.8, 0.5)		-2.1 (-4.8, 0.5)		-2.4 (-5.0, 0.2)	
Behavioral Symptom Index (BSI)			0.45		0.45		0.44		0.36
	1	0.3 (-1.3, 1.9)		0.3 (-1.3, 1.9)		0.3 (-1.3, 1.9)		0.6 (-0.9, 2.1)	
	2	0.3 (-1.3, 2.0)		0.4 (-1.3, 2.1)		0.4 (-1.3, 2.2)		0.7 (-0.9, 2.3)	
	3	1.1 (-0.6, 2.8)		1.2 (-0.5, 2.9)		1.2 (-0.5, 2.9)		1.6 (0.0, 3.1)	
	4	1.0 (-1.1, 3.1)		1.1 (-1.0, 3.1)		1.1 (-1.0, 3.2)		1.4 (-0.6, 3.5)	
	5	1.4 (-1.3, 4.1)		1.5 (-1.2, 4.2)		1.5 (-1.3, 4.3)		1.9 (-0.7, 4.6)	
	8	2.5 (0.1, 4.9)		2.5 (0.2, 4.9)		2.6 (0.2, 5.0)		2.9 (0.6, 5.2)	
Externalizing Problems			0.20		0.21		0.19		0.10
	1	0.6 (-1.0, 2.1)		0.6 (-1.0, 2.2)		0.6 (-1.0, 2.2)		0.9 (-0.6, 2.4)	
	2	0.9 (-0.6, 2.5)		1.0 (-0.6, 2.5)		1.0 (-0.6, 2.7)		1.3 (-0.2, 2.8)	
	3	1.8 (0.1, 3.4)		1.8 (0.2, 3.4)		1.8 (0.2, 3.5)		2.2 (0.7, 3.8)	
	4	0.9 (-1.1, 2.9)		1.0 (-1.0, 3.0)		1.0 (-1.0, 3.0)		1.3 (-0.7, 3.3)	
	5	1.6 (-0.8, 4.1)		1.7 (-0.8, 4.2)		1.7 (-0.8, 4.3)		2.1 (-0.3, 4.5)	
	8	3.1 (0.7, 5.4)		3.1 (0.8, 5.4)		3.1 (0.8, 5.5)		3.6 (1.4, 5.9)	
Internalizing Problems			0.89		0.90		0.89		0.87
	1	0.5 (-1.1, 2.1)		0.6 (-0.9, 2.2)		0.6 (-0.9, 2.1)		0.6 (-0.9, 2.1)	
	2	0.5 (-1.1, 2.2)		0.7 (-0.9, 2.3)		0.7 (-0.9, 2.4)		0.7 (-0.9, 2.3)	
	3	0.1 (-1.7, 1.9)		0.3 (-1.5, 2.0)		0.3 (-1.5, 2.0)		0.2 (-1.3, 1.8)	
	4	0.5 (-1.6, 2.5)		0.7 (-1.3, 2.8)		0.7 (-1.3, 2.8)		0.6 (-1.4, 2.6)	
	5	0.6 (-1.8, 2.9)		0.8 (-1.6, 3.1)		0.8 (-1.6, 3.2)		0.6 (-1.6, 2.9)	
	8	1.3 (-0.6, 3.3)		1.5 (-0.4, 3.4)		1.5 (-0.5, 3.4)		1.5 (-0.4, 3.4)	

Main adjusted model includes child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine. Sensitivity Analysis 1 model also includes the HOME Inventory Score assessed at age 1 year. Sensitivity Analysis 2 model includes HOME Inventory Score and maternal IQ. Total participants = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171). Heterogeneity p-values included to indicate difference in associations by exposure timing.

**Table S9.** Adjusted relative risk of BASC-2 scores classified as at-risk or clinically significant at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentrations from sensitivity analyses adjusting for other covariates.

BASC- 2 Composite Scale or Subscale	Age-adjusted Results	Main Results	Sensitivity Analysis 1: Adjusting for HOME Inventory Score	Sensitivity Analysis 2: Adjusting for HOME Inventory Score and Maternal IQ	Sensitivity Analysis 3: Adjusting for Maternal Education Instead of Household Income
Adaptive Skills	1.43 (1.10, 1.87)	1.31 (0.98, 1.80)	1.33 (1.00, 1.80)	1.32 (0.98, 1.77)	1.37 (1.02, 1.84)
Behavioral Symptom Index (BSI)	1.70 (1.22, 2.35)	1.60 (1.03, 2.48)	1.64 (1.09, 2.46)	1.65 (1.10, 2.50)	1.69 (1.12, 2.56)
Internalizing	1.10 (0.69, 1.75)	0.96 (0.53, 1.72)	0.99 (0.56, 1.76)	1.02 (0.57, 1.83) <sup>a</sup>	0.89 (0.51, 1.56)
Externalizing	1.73 (1.19, 2.51)	1.56 (0.95, 2.56)	1.55 (0.94, 2.56)	1.52 (0.89, 2.61)	1.56 (0.98, 2.48)
<i>Hyperactivity</i>	1.47 (1.14, 1.88)	1.48 (1.08, 2.02)	1.48 (1.09, 2.01)	1.48 (1.09, 2.01)	1.42 (1.05, 1.93)
<i>Aggression</i>	1.60 (1.16, 2.20)	1.72 (1.19, 2.51)	1.71 (1.18, 2.49)	1.76 (1.20, 2.59)	1.73 (1.19, 2.51)
<i>Conduct</i>	1.94 (1.04, 3.62)	1.73 (0.97, 3.07)	1.74 (0.97, 3.10)	1.63 (0.91, 2.92)	2.15 (1.04, 4.45)

Main adjusted model includes child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms, child's serum cotinine.

Adaptive Skills, BSI, Internalizing, and Externalizing Composite, as well as Hyperactivity and Aggression Subscale models include repeated blood lead concentrations (ages 2-8 years) and repeated BASC-2 score category (participants n=232).

Conduct models include blood lead concentrations at age 8 years and BASC-2 scores at age 8 years only (participants n=147).

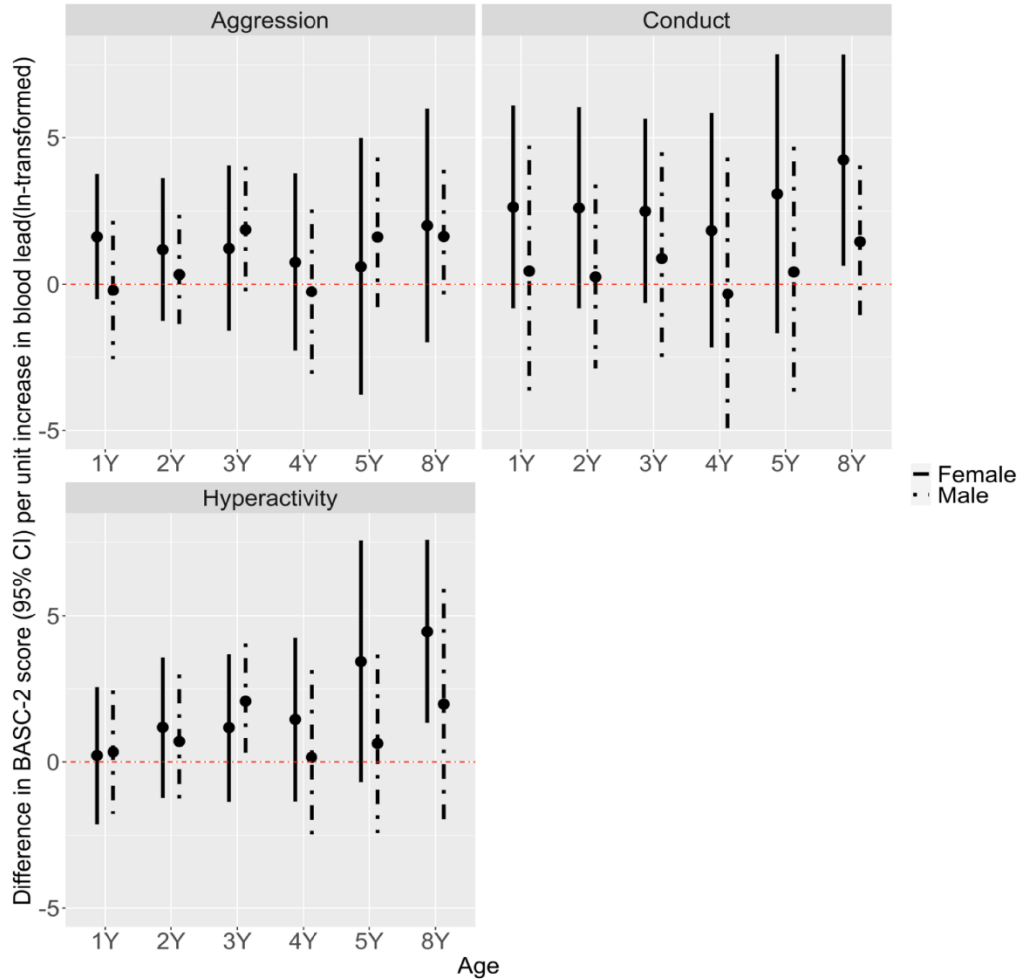
At-risk for clinically significant problematic behaviors indicated by Adaptive Skills scores  $\leq 40$ , or BSI, Internalizing, as well as Externalizing composite and subscale scores  $\geq 60$

<sup>a</sup> Model did not converge with both HOME Inventory score and maternal IQ added to fully-adjusted models, so only maternal IQ was added to the model.

**Table S10.** Adjusted difference in BASC-2 Composite Scales per unit increase in ln-transformed blood lead concentration from sensitivity analyses.

BASC-2 Composite Scale	Exposure Period (years)	Fully-adjusted		8-year BASC Only		Removing Intervention	
		$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p	$\beta$ (95% CI)	Heterogeneity p
Adaptive Skills			0.22		0.05		0.23
	1	-0.3 (-1.8, 1.3)		-1.8 (-4.0, 0.3)		-0.2 (-1.8, 1.4)	
	2	0.8 (-0.8, 2.5)		0.5 (-1.9, 2.9)		0.9 (-0.8, 2.6)	
	3	-0.2 (-2.0, 1.5)		-1.0 (-3.3, 1.4)		-0.2 (-2.0, 1.6)	
	4	0.1 (-2.3, 2.5)		-0.6 (-4.0, 2.8)		0.1 (-2.2, 2.5)	
	5	-0.5 (-3.3, 2.3)		0.2 (-3.0, 3.4)		-0.5 (-3.3, 2.3)	
	8	-2.2 (-4.9, 0.5)		-2.2 (-4.8, 0.5)		-2.2 (-4.9, 0.5)	
Behavioral Symptom Index (BSI)			0.44		0.47		0.44
	1	0.3 (-1.3, 1.9)		2.0 (-0.2, 4.2)		0.3 (-1.3, 1.9)	
	2	0.3 (-1.3, 2.0)		0.7 (-1.7, 3.1)		0.4 (-1.3, 2.1)	
	3	1.1 (-0.6, 2.8)		1.3 (-0.8, 3.3)		1.2 (-0.5, 2.9)	
	4	1.0 (-1.1, 3.1)		1.6 (-1.2, 4.5)		1.1 (-1.0, 3.2)	
	5	1.4 (-1.3, 4.1)		1.7 (-1.4, 4.8)		1.5 (-1.3, 4.2)	
	8	2.5 (0.1, 4.9)		2.3 (0.0, 4.6)		2.6 (0.2, 5.0)	
Externalizing Problems			0.20		0.69		0.20
	1	0.6 (-1.0, 2.1)		1.8 (-0.5, 4.1)		0.6 (-0.9, 2.2)	
	2	0.9 (-0.6, 2.5)		1.3 (-1.0, 3.6)		1.0 (-0.6, 2.6)	
	3	1.8 (0.1, 3.4)		1.9 (-0.1, 3.9)		1.8 (0.1, 3.5)	
	4	0.9 (-1.1, 2.9)		1.5 (-1.3, 4.3)		1.0 (-1.1, 3.0)	
	5	1.6 (-0.8, 4.1)		1.9 (-1.0, 4.9)		1.7 (-0.8, 4.2)	
	8	3.1 (0.7, 5.4)		2.9 (0.7, 5.1)		3.1 (0.8, 5.5)	
Internalizing Problems			0.89		0.57		0.88
	1	0.5 (-1.1, 2.1)		1.6 (-0.5, 3.6)		0.6 (-1.0, 2.2)	
	2	0.5 (-1.1, 2.2)		0.5 (-1.6, 2.6)		0.6 (-1.1, 2.4)	
	3	0.1 (-1.7, 1.9)		0.6 (-1.3, 2.6)		0.2 (-1.6, 2.0)	
	4	0.5 (-1.6, 2.5)		1.1 (-1.2, 3.4)		0.6 (-1.5, 2.7)	
	5	0.6 (-1.8, 2.9)		1.1 (-1.4, 3.7)		0.6 (-1.8, 3.1)	
	8	1.3 (-0.6, 3.3)		1.6 (-0.4, 3.5)		1.5 (-0.5, 3.5)	

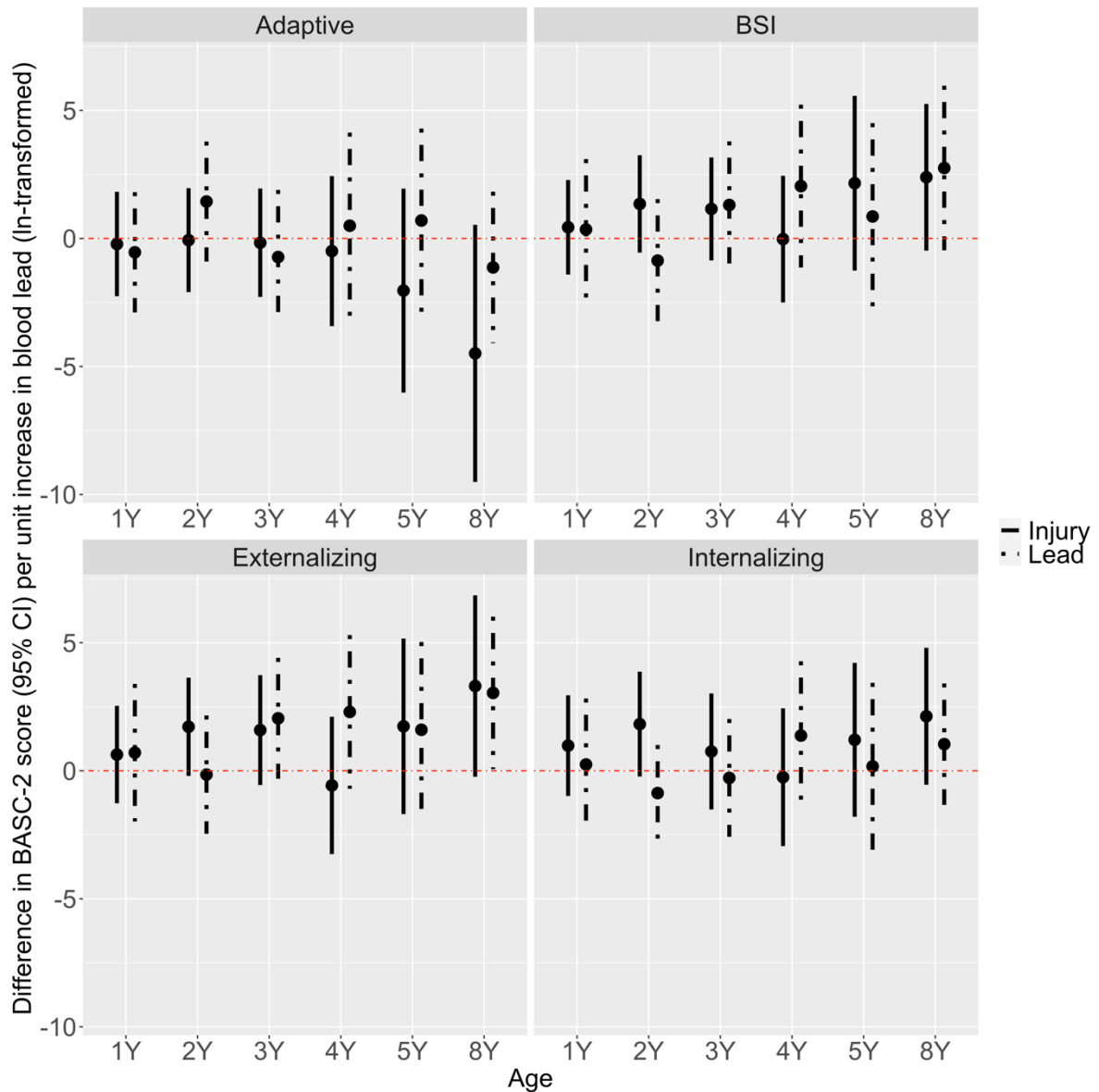
Main fully-adjusted include child's age, sex, intervention group, household income, maternal race, maternal depressive symptoms.



**Figure S1. Adjusted difference in repeated BASC-2 composite scores at ages 2-8 years per unit increase in ln-transformed blood lead concentration at ages 1, 2, 3, 4, 5, and 8 years by sex.**

Model adjusted for child's age, household income, maternal race, maternal depressive symptoms, child's serum cotinine, intervention group.

Total participants = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171). Conduct models include blood lead concentrations at age 1, 2, 3, 4, 5 and 8 years and BASC-2 scores at age 8 years only (participants n=147). Female (n=132) Heterogeneity p-value: Aggression = 0.88, Conduct = 0.57, Hyperactivity = 0.10; Male (n=112) Heterogeneity p-value: Aggression = 0.18, Conduct = 0.95, Hyperactivity = 0.33.



**Figure S2.** Adjusted difference in repeated BASC-2 composite scores at ages 2, 3, 4, 5, and 8 years per unit increase in ln-transformed blood lead concentration at ages 1, 2, 3, 4, 5, and 8 years in the injury prevention (n=125) and lead hazard (n=119) intervention groups. Model adjusted for child's age, sex, household income, maternal race, maternal depressive symptoms, child's serum cotinine. Total participants = 244 (BASC observations: 2Y = 222; 3Y = 210; 4Y = 151; 5Y = 164; 8Y = 171).