

Supplementary Online Content

Reuben A, Caspi A, Belsky DW, et al. Association of childhood blood-lead levels with cognitive function and socioeconomic status at age 38 years and with IQ change and socioeconomic mobility between childhood and adulthood. *JAMA*. doi:10.1001/jama.2017.1712

eFigure. Mediation Analysis of the Association Between Childhood Blood Lead Levels and Downward Social Mobility From Childhood to Adulthood in the Dunedin Cohort

eTable 1. Descriptive Statistics for Study Variables Used in Sensitivity and Secondary Analyses

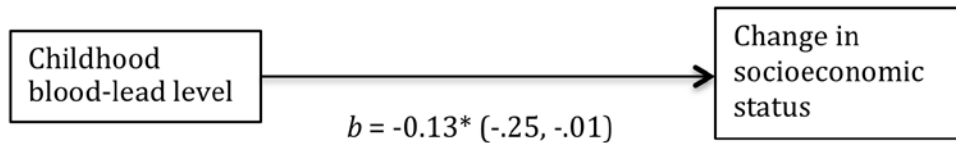
eTable 2. Association of Childhood Blood Lead Level With WAIS-IV IQ and Socioeconomic Status in Adulthood Using Transformations of the Lead Variable and Additional Covariates

This supplementary material has been provided by the authors to give readers additional information about their work.

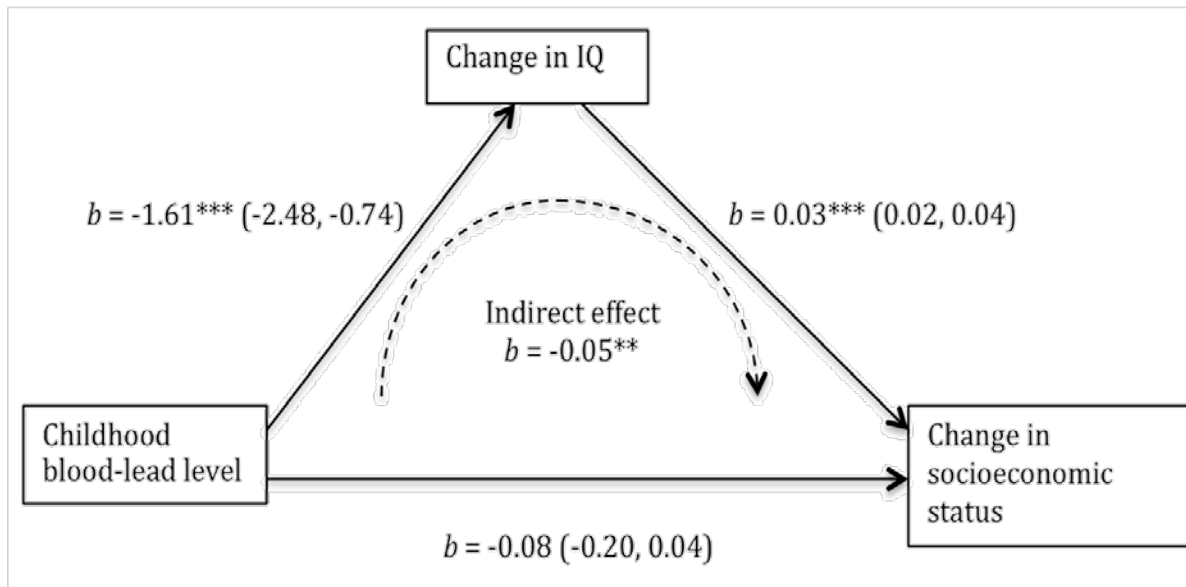
eFigure. Mediation Analysis of the Association Between Childhood Blood-Lead Levels and Downward Social Mobility From Childhood to Adulthood in the Dunedin Cohort

Decline in IQ from childhood to adulthood partially but significantly mediated the association between childhood blood-lead levels and downward social mobility from childhood to adulthood, after adjusting for covariates.

(A). Unmediated model showing the association between childhood blood-lead levels (theorized independent variable) and downward change in socioeconomic status from childhood to adulthood (theorized dependent variable).



(B). Mediated model showing the association between childhood blood-lead level (theorized independent variable), change in IQ from childhood to adulthood (theorized mediator), and change in socioeconomic status from childhood to adulthood (theorized dependent variable).



Note. * $p < .05$, ** $p < .01$, *** $p < .001$. 95% confidence interval reported in parentheses. Covariates include: sex, maternal IQ, participants' childhood IQ and socioeconomic origins. $N = 533$.

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eTable 1. Descriptive Statistics for Study Variables Used in Sensitivity and Secondary Analyses

	Full Sample (N = 1037)			Alive at age 38 years						Lead vs No Lead p-value
				Lead Data at age 11 (N = 565)			No Lead Data at age 11 (N = 442)			
	N	Mean	% or SD	N	Mean	% or SD	N	Mean	% or SD	
Sensitivity analysis variables										
Childhood blood lead level, corrected for hematocrit	--	--	--	565	28.25	(11.89)				
Birthweight in kgs	1037	3.38	(0.52)	565	3.41	(0.52)	442	3.32	(0.52)	0.01
Maternal smoking during pregnancy	278/777		(35.8%)	176/515		(34.2%)	97/248		(39.1%)	0.18
Secondary analysis variables (WAIS-IV subscales)										
Age-38 Verbal Comprehension IQ	942	100.00	(15.00)	542	100.92	(14.77)	400	98.75	(15.24)	0.03
Age-38 Perceptual Reasoning IQ	940	100.00	(15.00)	541	100.99	(15.20)	399	98.66	(14.63)	0.02
Age-38 Working Memory IQ	939	100.00	(15.00)	541	100.68	(15.17)	398	99.07	(14.74)	0.11
Age-38 Processing Speed IQ	941	100.00	(15.00)	542	100.92	(14.53)	399	98.75	(15.55)	0.03

eTable 2. Association of Childhood Blood Lead Level With WAIS-IV IQ and Socioeconomic Status in Adulthood Using Transformations of the Lead Variable and Additional Covariates

Table presents the association between childhood blood-lead levels and adult outcomes using different transformations of the blood-lead measure, including logarithmic transformation and a correction for hematocrit levels. Effects are presented as standardized coefficients to enable comparison across the models. All covariates were included in these tests: sex, maternal IQ, participants' childhood IQ and their socioeconomic origins.

(A). Lower cognitive performance at age 38 per 1 SD increase in childhood blood-lead level

	Original Fully Adjusted			LN Lead-Level			Hematocrit Adjusted			Additional Covariates		
	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>
WAIS-IV Full-scale IQ	-0.10	(-0.16, -0.05)	< 0.001	-0.10	(-0.15, -0.04)	< 0.001	-0.10	(-0.16, -0.05)	< 0.001	-0.10	(-0.16, -0.05)	< 0.001
WAIS-IV Verbal Comprehension	-0.05	(-0.12, 0.01)	0.090	-0.06	(-0.12, 0.00)	0.065	-0.05	(-0.12, 0.01)	0.099	-0.05	(-0.12, 0.01)	0.099
WAIS-IV Perceptual Reasoning	-0.13	(-0.22, -0.07)	<0.001	-0.12	(-0.20, -0.06)	< 0.001	-0.13	(-0.21, -0.07)	< 0.001	-0.13	(-0.22, -0.06)	<0.001
WAIS-IV Working Memory	-0.07	(-0.15, -0.01)	0.028	-0.07	(-0.15, -0.01)	0.029	-0.08	(-0.16, -0.01)	0.018	-0.07	(-0.15, 0.00)	0.043
WAIS-IV Processing Speed	-0.05	(-0.13, 0.03)	0.233	-0.05	(-0.13, 0.03)	0.191	-0.04	(-0.13, 0.03)	0.256	-0.05	(-0.14, 0.03)	0.191

(B). Lower socioeconomic status at age 38 per 1 SD increase in childhood blood-lead level

	Original Fully Adjusted			LN Lead-level			Hematocrit adjusted			Additional covariates		
	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>
Socioeconomic status	-0.10	(-0.18, -0.02)	0.012	-0.09	(-0.17, -0.02)	0.014	-0.11	(-0.19, -0.04)	0.005	-0.09	(-0.18, -0.02)	0.019

Note. CI = Confidence Interval. Covariates in the fully adjusted model were sex, maternal IQ, participants' childhood IQ and childhood socioeconomic status. Additional covariates were child birth weight and maternal smoking during pregnancy. Regression coefficients indicate change in standardized outcome per 1 SD increase in childhood blood-lead level. Socioeconomic status was assessed at age 38 years using the New Zealand Socioeconomic Index-2006, (NZSEI-06; range 10 lowest - 90 highest).