Online Supplemental Material

Supplemental Table 1. Comparison of characteristics for participants included versus excluded from the analytic sample

	Included in analysis (n=2,084)	Excluded from analysis[1]	p-value[2]
Prepregnancy BMI, kg/m^2 [Mean±SD] (n)	22.0±3.4 (2,084)	22.6±0.17 (545)	<0.001
Prepregnancy BMI category,%			0.001
Underweight (<18.5 kg/m^2)	182 (8.7)	38 (7.0)	
Normal weight (18.5-24.9 kg/m^2)	1,609 (77.2)	402 (73.8)	
Overweight (25-29.9 kg/m^2)	234 (11.2)	73 (13.4)	
Obese (≥30 kg/m^2)	59 (2.8)	32 (5.9)	
Pregnancy weight gain, kg [Mean±SD] (n)	12.0±4.3 (2,084)	12.7±5.9 (492)	0.07
Maternal Race, %			0.13
White	1,492 (71.6)	1,115 (69.4)	
Black	445 (21.4)	366 (22.8)	
Hispanic	56 (2.7)	62 (3.9)	
Asian	91 (4.4)	64 (4.0)	
Multiparous (yes/no), %	1,234 (76.8)	1,621 (77.8)	0.51
Maternal age, y [Mean±SD] (n)	28.4±5.9 (2,084)	28.2±6.2 (1,597)	0.44
Maternal education, %			<0.001
Less than high school	264 (12.7)	302 (18.9)	
High school and/or Trade School	901 (43.2)	705 (44.1)	
Some college/College degree	919 (44.1)	592 (37.0)	
Maternal Raw Peabody[1], score [Mean±SD] (n)	125.5±18.4 (1,652)	123.6±20.1 (1,224)	0.07
Married (yes/no), %	2,055 (98.6)	1,541 (98.2)	0.34
Income, relative to 1960 census median, %			<0.001
Below median	719 (34.5)	646 (52.5)	
At median	339 (16.3)	199 (16.2)	
Above median	1,026 (49.2)	385 (31.3)	
Child			
Male sex, %	1,077 (51.7)	805 (50.1)	0.34
Birthweight, grams [Mean±SD] (n)	3352±508 (2,084)	3379±527 (1,607)	0.11
Age at 9 year exam, y [Mean±SD] (n)	9.82±0.82 (2,084)	10.34±0.87 (1,607)	<0.001
Weight at age 9, kg [Mean±SD] (n)	33.5±7.2 (2,084)	35.6±7.8 (1,594)	<0.001
Height at age 9, cm [Mean±SD] (n)	137.6±7.6 (2,084)	140.3±7.6 (1,594)	<0.001
Standardized Peabody score[2] [Mean±SD] (n)	50.6±10.0 (2,084)	49.3±9.9 (1,541)	<0.001
Standardized Raven score[2] [Mean±SD] (n)	50.4±10.0 (2,084)	49.5±10.0 (1,604)	0.01

[1]Sample size varies due to missing data. [2]Preliminary analyses compared the baseline characteristics of dyads in the analytic sample (n=2,084) to those who were not in the analysis but who had child cognitive outcomes measured at ages 9-11 (n=1,653) using chi-square tests for categorical variables and t-tests for continuous normally distributed variables and Wilcoxon rank-sum test for non-normally distributed continuous variables

Supplemental Table 2. Adjusted Associations between Maternal Prepregnancy BMI, Pregnancy Weight Gain and Child Cognitive Scores at age 9, Child Health and Development Studies Enrolled from 1960-1963

	PPVT Score		Raven Score	
	Estimated-β	**95% CI**	**Estimated-β**	**95% CI**
Model 1: Primary model with interaction terms (n=2084)				
Prepregnancy BMI category				
Underweight	-0.40	-5.19, 4.38	-0.83	-5.48, 3.83
Normal weight	Referent		Referent	
Overweight	-3.30	-6.17, -0.43	-3.43	-6.55, -0.30
Obese	-5.47	-9.23, -1.71	-0.88	-5.10, 3.34
Interaction term between GWG and BMI: Estimated β for a 1-unit increase in pregnancy weight gain by prepregnancy BMI category, kg				
Underweight	0.06	-0.29, 0.41	0.03	-0.32, 0.38
Normal weight	-0.09	-0.21, 0.04	-0.003	-0.13, 0.12
Overweight	0.17	-0.05, 0.39	0.23	-0.001, 0.47
Obese	0.31	-0.03, 0.66	-0.09	-0.55, 0.36
Model 2: Primary model (n=2084)				
Prepregnancy BMI category				
Underweight	0.36	-1.20, 1.91	-0.51	-2.01, 0.99
Normal weight	Referent		Referent	
Overweight	-1.29	-2.55, -0.04	-0.71	-2.09, 0.67
Obese	-2.65	-4.99, -0.32	-1.43	-4.27, 1.42
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.03	-0.13, 0.07	0.04	-0.06, 0.14
Model 3: Primary model, unadjusted (n=2084)				
Prepregnancy BMI category				
Underweight	-0.98	-2.53, 0.57	-1.09	-2.59, 0.41
Normal weight	Referent		Referent	
Overweight	-0.95	-2.30, 0.40	-1.04	-2.39, 0.31
Obese	-3.00	-5.24, -0.75	-2.15	-5.00, 0.71
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.08	-0.18, 0.02	0.02	-0.08, 0.13
Model 4: GWG quartiles (n=2084)				
Prepregnancy BMI category				
Underweight	0.36	-1.20, 1.91	-0.48	-1.98,1.02
Normal weight	Referent		Referent	
Overweight	-1.29	-2.56, -0.03	-0.80	-2.19, 0.60
Obese	-2.63	-4.96, -0.30	-1.66	-4.46, 1.15
GWG quartiles				
Quartile 1 [Mean (SD): 6.91 kg (2.21)]	0.38	-0.80, 1.56	0.57	-0.63, 1.78
Quartile 2 [Mean (SD): 10.50 kg (0.75)]	Referent		Referent	
Quartile 3 [Mean (SD): 13.1 kg (0.78)]	0.35	-0.74, 1.44	0.69	-0.50,1.88

Quartile 4 [Mean (SD): 17.6 kg (2.85)]	-0.10	-1.24, 1.04	0.68	-0.50, 1.86
Model 5: Oldest CHDS child per family (n=1825)				
Prepregnancy BMI category				
Underweight	-0.16	-1.72, 1.40	-1.33	-2.95, 0.29
Normal weight	Referent		Referent	
Overweight	-1.12	-2.56, 0.32	-0.48	-1.98, 1.02
Obese	-2.92	-5.52, -0.31	-1.60	-4.31, 1.11
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.02	-0.13, 0.09	0.04	-0.07, 0.16
Model 6: Excluding those measured 7-28 days before delivery (n=1882)				
Prepregnancy BMI category				
Underweight	-0.17	-1.86,1.51	-0.90	-2.51, 0.72
Normal weight	Referent		Referent	
Overweight	-1.05	-2.36, 0.25	-0.57	-2.02, 0.88
Obese	-2.07	-4.63, 0.50	-0.88	-4.07, 2.31
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.03	-0.14, 0.08	0.05	-0.06, 0.16
Model 7: Term deliveries (n=1953)				
Prepregnancy BMI category				
Underweight	0.20	-1.38, 1.79	-0.56	-2.07, 0.95
Normal weight	Referent		Referent	
Overweight	-1.42	-2.70, -0.14	-0.62	-2.03, 0.79
Obese	-2.31	-4.72, 0.10	-1.65	-4.58, 1.29
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.02	-0.12, 0.08	0.04	-0.07, 0.14
Model 8: Adding maternal IQ (n=1652)				
Prepregnancy BMI category				
Underweight	0.63	-0.98, 2.24	-0.70	-2.29, 0.89
Normal weight	Referent		Referent	
Overweight	-1.01	-2.44, 0.42	-0.61	-2.18, 0.96
Obese	-2.23	-4.74, 0.28	-2.05	-5.24, 1.14
Estimated β for a 1-unit increase in pregnancy weight gain, kg	0.02	-0.10, 0.13	0.09	-0.03, 0.21
Model 9: IPW (n=2084)				
Prepregnancy BMI category				
Underweight	0.37	-1.16, 1.90	-0.44	-1.94, 1.07
Normal weight	Referent		Referent	
Overweight	-1.42	-2.67, -0.17	-0.73	-2.10, 0.64
Obese	-2.55	-4.92, -0.17	-1.21	-4.09, 1.67
Estimated β for a 1-unit increase in pregnancy weight gain, kg	-0.02	-0.12, -0.08	0.04	-0.07, 0.14

Results shown are estimated β-coefficients for age, sex and race standardized continuous Peabody and Raven scores from multivariable linear regression models for each test, controlling for covariates. Normal weight prepregnancy BMI is the reference group. The adjustment set included pregnancy weight gain, maternal age, race, parity, income, education, and child birth weight, and size at 9-years. Models 1-3, 5 included robust standard errors to account for clustering by family. Model 8 included adjustment for multiple children in CHDS. GWG, Gestational weight gain; IPW, Inverse probability weight; PPVT, Peabody Picture Vocabulary Test.

Supplemental Figure 1. Adherence to 2009 Institute of Medicine pregnancy weight gain recommendations for each prepregnancy BMI category (n=2,084), Child Health and Development Studies (1960 to 1963). 8.7% of women were underweight before pregnancy, 77.2% were normal weight, 11.2% were overweight, and 2.8% were obese.