Supplemental Material: Maternal Pre-Pregnancy BMI and Gestational Weight Gain Are Associated with Preschool Children's Neuropsychological Outcomes in the APrON Cohort

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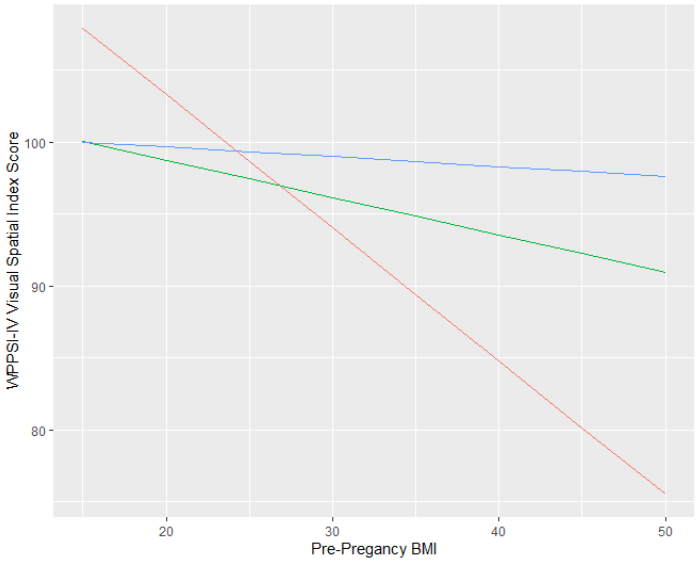
Power Analysis

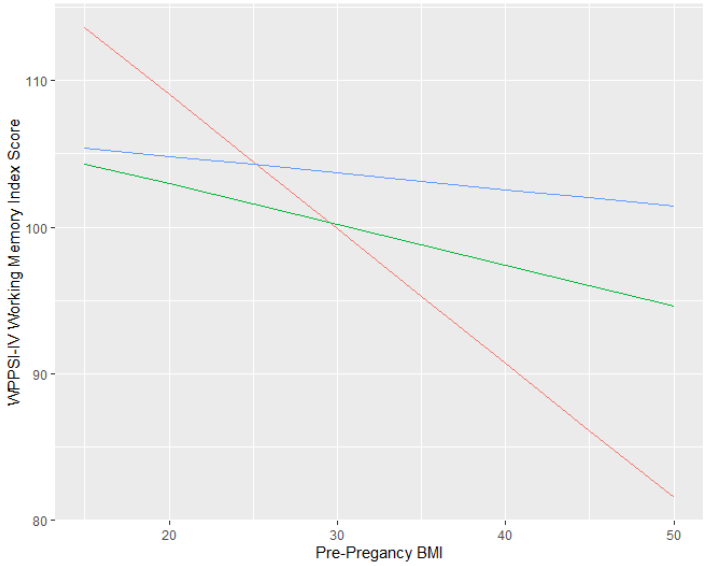
A power analysis was conducted to determine if our sample size was sufficient to detect a significant interaction between maternal pre-pregnancy body mass index (BMI) and gestational weight gain (GWG) on children's neurodevelopment. We used G*Power 3.1.9.7; linear multiple regression: fixed model, R^2 increase, with a medium effect size of 0.15, α of 0.05, power of 0.95, 3 tested predictors (i.e., BMI, GWG, interaction term), and 8 possible covariates for a total of 11 predictors. This analysis indicated that a sample size of 178 was sufficient; the present sample of 379 maternal-child pairs was well-powered to detect significant effects.

Figure S1. Interaction graphs showing the adjusted associations between maternal pre-pregnancy body mass index (BMI) and children's scores on the WPPSI-IV Visual Spatial Index (A) and on the Working Memory Index (B) by maternal gestational weight gain (GWG) class.

A)



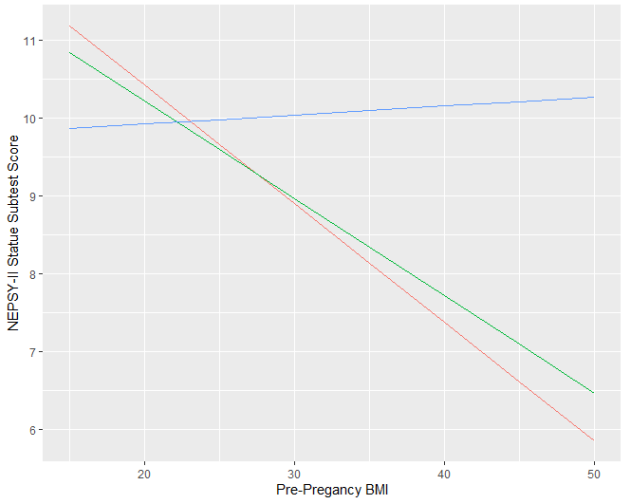
B)



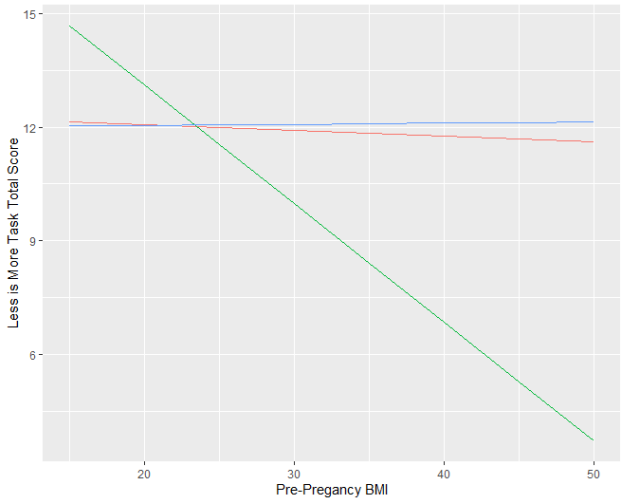
Note. Higher scores on the WPPSI-IV^{CND} indexes indicate better performance. Maternal GWG was classified as below (green line), within (red line), or above (blue line) the 2009 Institute of Medicine guidelines for recommended weight gain during pregnancy based on maternal pre-pregnancy BMI.

Figure S2. Interaction graphs showing the adjusted associations between maternal pre-pregnancy body mass index (BMI) and children's scores on the NEPSY-II Statue subtest (A), Less if More (B) and the BRIEF-P Inhibitory Self-Control Index (C) by maternal gestational weight gain (GWG) class.

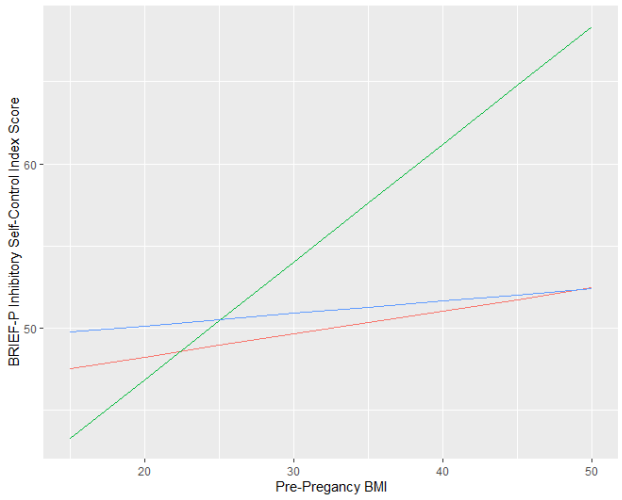
A)



B)



C)



Note. A) Adjusted associations between maternal pre-pregnancy body mass index (BMI) and children's scores on the NEPSY-II Statue subtest by maternal gestational weight gain (GWG) class. B) Adjusted associations between maternal BMI and children's scores on the Less is More task based on maternal GWG class. C) Adjusted associations between maternal BMI and children's scores on the BRIEF-P Inhibitory Self-Control (ISC) index based on maternal GWG class. Higher scores on the Statue subtest and Less is More task indicate better performance; higher scores on the BRIEF-P ISC index indicate more parent-reported difficulties. Maternal GWG was classified as below (green line), within (red line), or above (blue line) the 2009 Institute of Medicine guidelines for recommended weight gain during pregnancy based on maternal pre-pregnancy BMI.

Table S1. Child scores on the neurodevelopmental assessments for the overall sample and sub-groups stratified by maternal pre-pregnancy body mass index (BMI).

	Overall (N =379) M (SD)	**Underweight (n = 11) M (SD)**	**Normal Weight (n = 237) M (SD)**	**Overweight (n = 84) M (SD)**	**Obese (n = 47) M (SD)**	***p*-value[a]**
Measures of Intelligence and Language						
WPPSI-IV[CND] FSIQ[b]	104.61 (13.63)	111.09 (11.40)	105.95 (13.22)	101.64 (13.53)	101.64 (15.08)	0.01*
WPPSI-IV[CND] VCI[b]	106.58 (13.79)	107.36 (6.65)	107.68 (13.41)	105.45 (14.98)	102.85 (14.26)	0.14
WPPSI-IV[CND] VSI[b]	102.74 (14.54)	112.55 (14.04)	103.59 (14.34)	99.15 (14.74)	102.57 (14.06)	0.01*
WPPSI-IV[CND] WMI[b]	105.07 (15.17)	110.91 (11.07)	105.67 (15.60)	103.83 (13.62)	102.94 (16.23)	0.32
NEPSY-II Phonological Processing[c]	10.07 (3.17)	10.45 (3.05)	10.30 (3.11)	9.69 (3.33)	9.51 (3.18)	0.26
NEPSY-II Speeded Naming[c]	11.98 (2.90)	12.55 (3.24)	12.10 (2.75)	11.63 (3.11)	11.89 (3.22)	0.56
Measures of Memory, Motor Skills, and Behaviour						
NEPSY-II Memory for Design[c]	9.91 (2.87)	12.82 (4.53)	9.88 (2.79)	10.00 (3.01)	9.19 (2.06)	< 0.01*
NEPSY-II Narrative Memory[c]	10.07 (3.03)	9.82 (3.03)	10.21 (3.11)	9.77 (2.95)	9.95 (2.82)	0.69
NEPSY-II Sentence Repetition[c]	10.88 (3.25)	11.73 (3.23)	11.18 (3.01)	10.11 (3.83)	10.53 (3.11)	0.04*
MABC-2 Total[c]	9.44 (2.99)	10.18 (3.09)	9.57 (3.01)	9.35 (2.91)	8.74 (3.01)	0.29

MABC-2 Manual Dexterity[c]	8.68 (3.23)	9.00 (3.29)	8.96 (3.29)	8.68 (3.03)	7.26 (2.96)	0.01*
MABC-2 Aiming and Catching[c]	9.63 (3.14)	9.00 (3.61)	9.76 (3.12)	9.54 (2.78)	9.28 (3.74)	0.67
MABC-2 Balance[c]	10.48 (2.92)	12.91 (3.88)	10.43 (2.86)	10.19 (2.89)	10.64 (2.90)	0.03*
BASC-2 Externalizing Problems[d]	47.93 (8.18)	49.64 (6.67)	47.24 (7.89)	48.50 (8.47)	50.02 (9.11)	0.13
BASC-2 Internalizing Problems[d]	47.66 (9.10)	50.18 (10.52)	47.74 (8.99)	46.23 (8.21)	49.19 (10.57)	0.23
Measures of Executive Function						
Boy/Girl Stroop[e]	10.68 (4.75)	13.09 (4.11)	10.97 (4.66)	10.32 (4.75)	9.32 (5.07)	0.04*
Less is More[e]	11.79 (4.32)	13.27 (3.98)	11.80 (4.31)	11.74 (4.17)	11.53 (4.73)	0.70
NEPSY-II Statue[c]	10.10 (3.33)	11.09 (2.55)	10.16 (3.17)	9.98 (3.66)	9.79 (3.69)	0.66
Self-Ordered Pointing Task[f]	3.77 (1.72)	3.73 (1.62)	3.78 (1.66)	3.77 (1.88)	3.77 (1.77)	0.99
Spatial Span[g]	2.67 (1.09)	2.91 (1.45)	2.70 (1.08)	2.61 (1.15)	2.55 (0.93)	0.68
BRIEF-P GEC[d]	50.58 (9.95)	47.45 (8.55)	49.52 (9.47)	51.60 (10.47)	54.85 (10.50)	< 0.01*
BRIEF-P ISC[d]	50.31 (9.53)	48.09 (7.84)	49.52 (9.34)	51.17 (9.81)	53.26 (9.84)	0.06
BRIEF-P FLEX[d]	48.28 (8.79)	46.36 (7.59)	48.22 (9.00)	47.77 (8.38)	49.93 (8.72)	0.48
BRIEF-P EMC[d]	51.96 (10.63)	49.00 (9.11)	50.46 (9.72)	53.65 (11.77)	57.21 (11.37)	< 0.001*

Abbreviations: SD = standard deviation; WPPSI-IV^{CND} = Wechsler Preschool and Primary Scale of Intelligence- Fourth Edition, Canadian; FSIQ = Full-Scale IQ; VCI = Verbal Comprehension Index; VSI = Visual Spatial Index; WMI = Working Memory Index; NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition; MABC-2 = Movement Assessment Battery for Children- Second Edition; BASC-2 = Behavior Assessment System for Children- Second Edition; BRIEF-P = Behavior Rating Inventory of Executive Function- Preschool Version; GEC = Global Executive Composite; ISC = Inhibitory Self-Control; FLEX = Flexibility; EMC = Emergent Metacognition.

[a]*p*-values for *F* statistics from one-way analysis of variance (ANOVA) for differences between maternal pre-pregnancy BMI stratified groups on continuous neurodevelopmental scores

[b]Standard score; M = 100, SD = 15, Range = 40-160

[c]Scaled scores; M = 10, SD = 3, Range = 45-155

[d]*T* scores; M = 50, SD = 10, Range = 20-100; scores less than or equal to 59 are considered in the normal range, 60-64 is considered mildly elevated, and scores greater than or equal to 65 are considered significantly elevated
[e]total correct responses
[f]maximum achieved
[g]total errors
*$p < 0.05$

Table S2. Influence of covariates in models which investigated associations between continuous maternal pre-pregnancy body mass index (BMI), gestational weight gain (GWG), interactions and children's scores on measures of intelligence and language (N = 379).

	WPPSI-IV^{CND} FSIQ[a]	**WPPSI-IV^{CND} VCI[a]**	**WPPSI-IV^{CND} VSI[a]**	**WPPSI-IV^{CND} WMI[a]**	**NEPSY-II Phonological Processing[b]**	**NEPSY-II Speeded Naming[b]**
	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**
Annual household income	-7.63 (-11.35, -3.93)*	-9.28 (-13.19, -5.38)*	-7.04 (-11.46, -2.62)*	-3.83 (-8.01, 0.35)	-0.89 (-1.79, 0.03)	-1.33 (-2.17, 0.50)*
Maternal education	-4.36 (-7.60, -1.13)*	-3.92 (-7.32 -0.52)*	-3.11 (-6.96, 0.73)	-0.12 (-3.76, 3.51)	-0.47 (-1.26, 0.32)	-0.57 (-1.29, 0.16)
Parity	-0.10 (-2.93, 2.72)	-1.48 (-4.45, 1.48)	-1.23 (-4.58, 2.13)	1.59 (-1.58, 4.76)	0.00 (-0.69, 0.69)	-0.48 (-1.11, 0.15)
Maternal birthplace	-0.56 (-4.20, 3.09)	-2.96 (-6.79, 0.86)	-0.62 (-4.95, 3.71)	0.29 (-3.81, 4.38)	-0.94 (-1.83, -0.05)*	0.11 (-0.71, 0.92)
Maternal age	-0.17 (-0.55, 0.20)	-0.13 (-0.51, 0.26)	-0.03 (-0.47, 0.41)	-0.16 (-0.57, 0.26)	0.01 (-0.08, 0.10)	0.03 (-0.06, 0.11)
Child sex	-2.45 (-5.14, 0.23)	-3.70 (-6.51, -0.89)*	-2.40 (-5.59, 0.78)	-3.01 (-6.02, 0.00)	-1.23 (-1.88, -0.57)*	-0.27 (-0.87, 0.33)
Birthweight	0.00 (0.00, 0.01)	0.01 (0.00, 0.01)*	0.00 (0.00, 0.00)	0.00 (0.00, 0.01)	0.01 (0.00, 0.01)*	0.00 (0.00, 0.00)

Abbreviations: WPPSI-IV^{CND} = Wechsler Preschool and Primary Scale of Intelligence- Fourth Edition, Canadian; FSIQ = Full-Scale IQ; VCI = Verbal Comprehension Index; VSI = Visual Spatial Index; WMI = Working Memory Index; NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition.
[a]standard score; M = 100, SD = 15, Range = 40-160
[b]scaled scores; M = 10, SD = 3, Range = 45-155
*$p < 0.05$

Table S3. Influence of covariates in models which investigated associations between continuous maternal pre-pregnancy body mass index (BMI), gestational weight gain (GWG), interactions and children's scores on measures of memory, motor skills, and behavior (N = 379).

	NEPSY-II Memory for Design[a] ***B* (95% CI)**	**NEPSY-II Narrative Memory[a]** ***B* (95% CI)**	**NEPSY-II Sentence Repetition[a]** ***B* (95% CI)**	**MABC-2 Total[a]** ***B* (95% CI)**	**MABC-2 Manual Dexterity[a]** ***B* (95% CI)**	**MABC-2 Aiming and Catching[a]** ***B* (95% CI)**	**MABC-2 Balance[a]** ***B* (95% CI)**	**BASC-2 Externalizing Problems[b]** ***B* (95% CI)**	**BASC-2 Internalizing Problems[b]** ***B* (95% CI)**
Annual household income	-0.44 (-1.18, 0.31)	-0.73 (-1.61, 0.16)	-1.02 (-1.89, -0.15)*	-0.73 (-1.56, 0.11)	-0.95 (-1.88, -0.02)*	-0.13 (-1.05, 0.78)	-0.38 (-1.14, 0.39)	1.17 (-1.07, 3.40)	1.08 (-1.46, 3.63)
Maternal education	-0.11 (-0.76, 0.54)	0.14 (-0.63, 0.91)	-0.05 (-1.26, 0.26)	0.05 (-0.68, 0.78)	-0.27 (-1.08, 0.53)	-0.27 (-1.07, 0.52)	0.34 (-0.32, 1.01)	1.81 (-0.13, 3.76)	1.59 (-0.63, 3.80)
Parity	0.11 (-0.45, 0.68)	0.48 (-0.19, 1.15)	0.12 (-0.54, 0.78)	-0.20 (-0.84, 0.44)	0.33 (-0.38, 1.03)	-0.51 (-1.21, 0.19)	-0.46 (-1.04, 0.12)	0.40 (-1.29, 2.10)	-2.10 (-4.03, -0.17)*
Maternal birthplace	0.44 (-0.30, 1.17)	-0.43 (-1.29, 0.44)	-0.42 (-1.27, 0.43)	0.51 (-0.31, 1.33)	0.22 (-0.69, 1.13)	0.63 (-0.27, 1.53)	-0.19 (-0.93, 0.56)	-0.44 (-2.62, 1.75)	-0.72 (-3.21, 1.77)
Maternal age	-0.05 (-0.13, 0.02)	-0.03 (-0.12, 0.05)	-0.05 (-0.14, 0.03)	-0.04 (-0.13, 0.04)	-0.04 (-0.13, 0.06)	-0.03 (-0.12, 0.07)	0.01 (-0.07, 0.08)	-0.13 (-0.35, 0.09)	-0.10 (-0.35, 0.16)
Child sex	0.00 (-0.54, 0.54)	-0.18 (-0.82, 0.46)	-1.05 (-1.68, -0.42)*	-1.36 (-1.97, -0.76)*	-1.81 (-2.48, -1.14)*	-0.40 (-1.06, 0.26)	-0.73 (-1.28, -0.18)*	2.11 (0.51, 3.72)*	-1.33 (-3.16, 0.51)
Birthweight	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)

Abbreviations: NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition; MABC-2 = Movement Assessment Battery for Children- Second Edition; BASC-2 = Behavior Assessment System for Children- Second Edition.

[a] scaled scores; M = 10, SD = 3, Range = 45-155

[b]*T* scores; M = 50, SD = 10, Range = 20-100; scores less than or equal to 59 are considered in the normal range, 60-64 is considered mildly elevated, and scores greater than or equal to 65 are considered significantly elevated
*$p < 0.05$

Table S4. Influence of covariates in models which investigated associations between continuous maternal pre-pregnancy body mass index (BMI), gestational weight gain (GWG), interactions and children's scores on measures of executive function (N = 379).

	Boy/Girl Stroop[a]	**Less is More[a]**	**NEPSY-II Statue[b]**	**Self-Ordered Pointing Task[c]**	**Spatial Span[d]**	**BRIEF-P GEC[e]**	**BRIEF-P ISC[e]**	**BRIEF-P FLEX[e]**	**BRIEF-P EMC[e]**
	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**
Annual household income	-0.64 (-1.93, 0.65)	-0.32 (-1.42, 0.79)	-0.99 (-1.94, -0.04) *	0.27 (-0.21, 0.75)	-0.25 (-0.49, 0.00)	1.85 (-1.08, 4.77)	0.54 (-2.01, 3.08)	0.65 (-1.71, 3.00)	2.59 (-0.52, 5.70)
Maternal education	0.44 (-0.69, 1.56)	0.11 (-0.85, 1.07)	0.05 (-0.78, 0.87)	0.01 (-0.41, 0.43)	-0.07 (-0.28, 0.14)	1.34 (-1.21, 3.88)	0.94 (-1.28, 3.15)	0.55 (-1.50, 2.60)	1.64 (-1.06, 4.35)
Parity	0.06 (-0.92, 1.05)	0.87 (0.03, 1.71) *	0.53 (-0.19, 1.25)	-0.01 (-0.38, 0.35)	0.10 (-0.08, 0.28)	-2.35 (-4.57, -0.13)*	-1.56, (-3.49, 0.37)	-2.56 (-4.35, -0.77)*	-2.34 (-4.70, 0.02)
Maternal birthplace	0.53 (-0.74, 1.80)	-0.09 (-1.17, 1.00)	-0.21 (-1.14, 0.72)	0.11 (-0.36, 0.58)	0.01 (-0.23, 0.24)	-0.29 (-3.16, 2.57)	-0.59 (-3.08, 1.90)	-1.11 (-3.41, 1.20)	0.53 (-2.52, 3.58)
Maternal age	-0.01 (-0.14, 0.12)	-0.01 (-0.12, 0.10)	-0.05 (-0.14, 0.05)	0.02 (-0.03, 0.07)	-0.02 (-0.05, 0.00)	-0.03 (-0.32, 0.26)	-0.16 (-0.41, 0.09)	-0.06 (-0.30, 0.17)	0.09 (-0.22, 0.40)
Child sex	-1.05 (-1.98, -0.12)	-0.38 (-1.18, 0.41)	-1.35 (-2.03, -0.67)*	-0.02 (-0.37, 0.032)	-0.13 (-0.30, 0.05)	1.36 (-0.74, 3.47)	1.86 (0.03, 3.69)*	2.41 (0.71, 4.10)*	0.40 (-1.85, 2.64)
Birthweight	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.01 (0.00, 0.01)*	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)
Child age	2.52 (1.59, 3.45) *	3.42 (2.62, 4.21) *	-	-0.01 (-0.35, 0.34)	0.35 (0.18, 0.52) *	-	-	-	-

Abbreviations: NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition; BRIEF-P = Behavior Rating Inventory of Executive Function- Preschool Version; GEC = Global Executive Composite; ISC = Inhibitory Self-Control; FLEX = Flexibility; EMC = Emergent Metacognition.

[a]total correct responses

[b]scaled scores; M = 10, SD = 3, Range = 45-155

[c]total errors

[d]maximum achieved

[e]*T* scores; M = 50, SD = 10, Range = 20-100; scores less than or equal to 59 are considered in the normal range, 60-64 is considered mildly elevated, and scores greater than or equal to 65 are considered significantly elevated

Table S5. Sub-group analyses stratified by maternal pre-pregnancy body mass index (BMI) examining the associations between gestational weight gain (GWG) class and children's scores on measures of intelligence and language.

	WPPSI-IV^{CND} FSIQ[a]	**WPPSI-IV^{CND} VCI[a]**	**WPPSI-IV^{CND} VSI[a]**	**WPPSI-IV^{CND} WMI[a]**	**NEPSY-II Phonological Processing[b]**	**NEPSY-II Speeded Naming[b]**
	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**
Underweight (n = 11)						
GWG Below	56.78 (-418.37, 531.93)	-4.70 (-721.66, 712.27)	114.01(-1248.53, 1476.56)	20.84 (-888.87, 930.55)	42.30 (-177.10, 261.70)	8.75 (-273.44, 290.95)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-11.67 (-190.03, 166.70)	-3.66 (-272.80, 265.49)	-29.02 (-540.51, 482.47)	11.87 (-329.62, 353.37)	-16.23 (-177.10, 261.70)	9.62 (-96.31, 115.56)
Normal Weight (n = 237)						
GWG Below	-5.55 (-10.03, -1.07)*	-0.89 (-5.48, 3.71)	-5.17 (-10.17, -0.17)*	-6.16 (-11.58, -0.75)*	-1.08 (-2.15, -0.01)*	-1.14 (-2.10, -0.17)*
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-4.63 (-8.47, -0.79)*	-1.58 (-5.51, 2.36)	-4.02 (-8.30, 0.27)*	-3.68 (-8.32, 0.96)	-1.09 (-2.00, -0.17)*	-0.46 (-1.29, 0.36)
Overweight (n = 84)						
GWG Below	7.94 (-4.77, 20.66)	6.00 (-8.74, 20.75)	5.15 (-10.61, 20.90)	2.03 (-12.18, 16.25)	1.35 (-2.33, 5.02)	2.36 (-0.79, 5.51)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	0.97 (-5.53, 7.47)	-0.48 (-8.02, 7.05)	5.64 (-2.41, 13.69)	3.30 (-3.97, 10.56)	0.72 (-1.16, 2.60)	1.33 (-0.28, 2.94)

Obese						
(n = 47)						
GWG Below	-19.60 (-35.13, -4.06)*	-23.30 (-39.39, -7.20)*	-11.88 (-28.58, 4.82)	-1.71 (-20.24, 16.83)	-2.10 (-6.79, 2.59)	-1.35 (-4.65, 1.96)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-.18 (-10.48,10.84)	-6.29 (-17.33, 4.75)	1.65 (-9.80. 13.11)	5.90 (-6.81, 18.62)	-0.32 (-3.53, 2.90)	-0.55 (-2.82, 1.72)

Abbreviations: WPPSI-IV^{CND} = Wechsler Preschool and Primary Scale of Intelligence- Fourth Edition, Canadian; FSIQ = Full-Scale IQ; VCI = Verbal Comprehension Index; VSI = Visual Spatial Index; WMI = Working Memory Index; NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition.

[a] standard score; M = 100, SD = 15, Range = 40-160

[b] scaled scores; M = 10, SD = 3, Range = 45-155

*$p < 0.05$

Table S6. Sub-group analyses stratified by maternal pre-pregnancy body mass index (BMI) examining the associations between gestational weight gain (GWG) class and children's scores on measures of memory, motor skills, and behavior.

	NEPSY-II Memory for Design[a] ***B* (95% CI)**	**NEPSY-II Narrative Memory[a]** ***B* (95% CI)**	**NEPSY-II Sentence Repetition[a]** ***B* (95% CI)**	**MABC-2 Total[a]** ***B* (95% CI)**	**MABC-2 Manual Dexterity[a]** ***B* (95% CI)**	**MABC-2 Aiming and Catching[a]** ***B* (95% CI)**	**MABC-2 Balance[a]** ***B* (95% CI)**	**BASC-2 Externalizing Problems[b]** ***B* (95% CI)**	**BASC-2 Internalizing Problems[b]** ***B* (95% CI)**
Underweight (n = 11)									
GWG Below	0.17 (-595.67, 596.02)	-16.22 (-128.20, 95.77)	36.31 (-196.81, 269.42)	16.02 (-216.98, 249.03)	17.85 (-340.64, 376.33)	14.20 (-93.33, 121.72)	6.80 (-100.72, 114.33)	-27.94 (1049.64, 993.75)	34.08 (-978.37, 1046)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	13.75 (-209.92, 237.43)	-2.13 (-44.17, 39.91)	-13.23 (-100.74, 74.28)	-1.85 (-89.32, 85.62)	-5.67 (-140.24, 128.90)	-1.03 (-41.39, 39.34)	6.03 (-34.34, 46.39)	3.00 (-380.53, 386.54)	-17.35 (397.41, 362.72)
Normal Weight (n = 237)									
GWG Below	-0.39 (-1.29, 0.51)	-0.62 (-1.72, 0.48)	-0.67 (-1.69, 0.34)	-0.70 (-1.75, 0.35)	-0.73 (-1.88, 0.42)	-0.11 (-1.20, 0.98)	-0.53 (-1.39, 0.33)	-0.39 (-2.89, 2.12)	-1.77 (-4.70, 1.15)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-0.23 (-1.00, 0.54)	-0.98 (-1.92, -0.04)*	-0.36 (-1.23, 0.51)	-0.66 (-1.56, 0.24)	-0.69 (-1.68, 0.30)	-0.08 (-1.02, 0.85)	-0.59 (-1.32, 0.15)	1.29 (-0.86, 3.44)	0.57 (-1.94, 3.07)
Overweight (n = 84)									
GWG Below	-0.04 (-3.10, 3.03)	0.57 (-2.43, 3.57)	-0.89 (-4.54, 2.76)	1.36 (-1.60, 4.32)	0.24 (-2.97, 3.45)	3.62 (0.56, 6.69)*	0.51 (-2.48, 3.49)	8.89 (1.70, 16.08)*	1.81 (-6.31, 9.94)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	0.54 (-1.03, 2.10)	-0.42 (-1.95, 1.12)	1.01 (-0.85, 2.88)	0.72 (-0.80, 2.23)	0.92 (-0.72, 2.56)	1.27 (-0.29, 2.84)	0.36 (-1.16, 1.89)	-0.07 (-4.37, 2.98)	-0.73 (-4.88, 3.42)
Obese (n = 47)									
GWG Below	-2.65 (-5.29, -0.02)*	-3.26 (-6.46, -0.05)*	-5.01 (-8.74, -1.28)*	-1.75 (-5.06, 1.56)	-2.26 (-6.24, 1.72)	2.25 (-2.15, 6.66)	-2.78 (-6.22, 0.67)	9.38 (-2.92, 21.67)	-7.04 (-20.79, 6.71)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-0.97 (-2.77, 0.84)	-1.27 (-3.47, 0.93)	-2.26 (-4.82, 0.31)	0.26 (-2.01, 2.53)	-0.25 (-2.99, 2.48)	1.94 (-1.08, 4.96)	-0.11 (-2.47, 2.26)	3.12 (-5.32, 11.56)	1.73 (-7.71, 11.17)

Abbreviations: NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition; MABC-2 = Movement Assessment Battery for Children- Second Edition; BASC-2 = Behavior Assessment System for Children- Second Edition.

[a] scaled scores; M = 10, SD = 3, Range = 45-155

[b] *T* scores; M = 50, SD = 10, Range = 20-100; scores less than or equal to 59 are considered in the normal range, 60-64 is considered mildly elevated, and scores greater than or equal to 65 are considered significantly elevated

*$p < 0.05$

Table S7. Sub-group analyses stratified by maternal pre-pregnancy body mass index (BMI) examining the associations between gestational weight gain (GWG) class and child performance and parent report (BRIEF-P) measures of executive function.

	Boy/Girl Stroop [a]	**Less is More**[a]	**NEPSY-II Statue**[b]	**Self-Ordered Pointing Task**[c]	**Spatial Span**[d]	**BRIEF-P GEC**[e]	**BRIEF-P ISC**[e]	**BRIEF-P FLEX**[e]	**BRIEF-P EMC**[e]
	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**	***B* (95% CI)**
Underweight (n = 11)									
GWG Below	44.34 (-336.67, 425.36)	4.42 (-578.04, 586.87)	2.38 (-163.36, 168.13)	-0.99 (-184.69, 182.71)	8.42 (-170.82, 187.67)	31.32 (-1128.91, 1191.55)	32.74 (-679.44, 744.92)	19.85 (-1198.71, 1238.42)	26.52 (-1026.19, 1079.23)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-9.96 (-152.98, 133.07)	4.07 (-214.58, 222.72)	6.86 (-55.36, 69.08)	1.06 (-67.90, 70.02)	0.16 (-67.12, 67.45)	-21.00 (-456.54, 414.54)	-13.90 (-281.25, 253.45)	-14.50 (-471.94, 442.94)	-25.03 (-420.20, 370.15)
Normal Weight (n = 237)									
GWG Below	-0.40 (-1.78, 0.99)	0.32 (-1.13, 1.76)	-0.19 (-1.27, 0.89)	-0.44 (-0.99, 0.11)	0.33 (0.04, 0.63)*	0.84 (-2.48, 4.15)	-0.24 (-3.32, 2.83)	0.58 (-2.25, 3.41)	0.99 (-2.47, 4.45)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-0.53 (-1.72, 0.66)	-0.53 (-1.76, 0.71)	-0.43 (-1.36, 0.49)	0.01 (-0.47, 0.48)	-0.16 (-0.41, 0.10)	1.45 (-1.38, 4.29)	1.52 (-1.12, 4.15)	0.83 (-1.59, 3.26)	1.55 (-1.42, 4.51)
Overweight (n = 84)									
GWG Below	-2.47 (-7.30, 2.36)	-2.00 (-6.34, 2.33)	0.19 (-3.74, 4.12)	0.79 (-0.92, 2.50)	-0.56 (-1.48, 0.36)	10.66 (1.18, 20.14)*	10.17 (1.14, 18.94)*	5.55 (-1.71, 12.82)	6.20 (-5.25, 17.65)
GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	-0.29 (-2.76, 2.17)	0.51 (-1.71, 2.72)	0.03 (-1.97, 2.04)	0.43 (-0.45, 1.30)	-0.16 (-0.63, 0.31)	-1.66 (-6.51, 3.18)	0.50 (-3.98, 4.98)	-2.52 (-6.23, 1.19)	-2.53 (-8.38, 3.31)
Obese (n = 47)									
GWG Below	1.98 (-4.70, 8.66)	-5.09 (-10.81, 0.63)	0.33 (-4.22, 4.89)	-0.89 (-3.30, 1.52)	0.15 (-0.81, 1.11)	14.46 (-1.35, 30.27)	14.53 (1.72, 27.34)*	1.01 (-12.09, 14.11)	14.96 (-2.37, 32.29)

GWG Met	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
GWG Above	3.14 (-1.44, 7.73)	0.17 (-3.76, 4.09)	2.98 (-0.15, 6.11)	-1.31 (-2.97, 0.34)	0.28 (-0.37, 0.94)	6.98 (-3.87, 17.83)	5.97 (-2.82, 14.76)	2.90 (-6.09, 11.89)	9.51 (-2.38, 21.40)

Abbreviations: NEPSY-II = Developmental NEuroPSYchological Assessment- Second Edition; BRIEF-P = Behavior Rating Inventory of Executive Function- Preschool Version; GEC = Global Executive Composite; ISC = Inhibitory Self-Control; FLEX = Flexibility; EMC = Emergent Metacognition.

[a] total correct responses

[b] scaled scores; M = 10, SD = 3, Range = 45-155

[c] total errors

[d] maximum achieved

[e] *T* scores; M = 50, SD = 10, Range = 20-100; scores less than or equal to 59 are considered in the normal range, 60-64 is considered mildly elevated, and scores greater than or equal to 65 are considered significantly elevated

*$p < 0.05$