Supplementary Material

Trajectories of maternal leisure time physical activity and sedentary behavior during adolescence to young adulthood and offspring birthweight

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Table 1. Characteristics of eligible participants and analytic sample

	All Eligible (N=2801)		Analytic Sample (N=1408)	Excluded (N=1393)	
Maternal characteristics	N			N	
Age (years), weighted mean (SE)	2800	25 (0.1)	24 (0.2)	1391	25 (0.2)
Race, n (weighted %)	2793			1384	
Non-Hispanic white	1505	65	813 (67)	692	63
Non-Hispanic black	604	16	274 (14)	330	18
Hispanic	438	11	213 (11)	224	11
Other	246	7	108 (7)	138	7
Married at time of pregnancy, (n, weighted %)	1846	1545 (84)	770 (81)[a]	909	775 (88)
Nulliparous, n (weighted %)	2801	1572 (56)	813 (56)	1392	759 (56)
Smoking during pregnancy, n (weighted %)	2796	512 (21)	284 (24)	1387	227 (19)
Alcohol use during pregnancy, n (weighted %)	2798	146 (6)	86 (7)	1389	60 (4)
Offspring characteristics					
Birthweight (grams), weighted mean (SE)	2778	3288 (17.6)	3281 (23.0)	1369	3295 (23.9)
Gestational age at delivery (weeks), weighted mean (SE)	2783	39 (0.1)	39 (0.1)	1374	39 (0.1)
Male, n (weighted %)	2801	1459 (52)	717 (52)	1392	741 (52)

[a]N=937

Table 2. Finals forms for trajectory groups

Trajectory groups	Form of trajectories
Leisure time physical activity	
Overall	All cubic
Normal weight	All quadratic
Overweight/obese	All cubic
Leisure time sedentary behavior	
Overall	All cubic
Normal weight	All quadratic
Overweight/obese	All quadratic

Table 3. Mean leisure time physical activity at each study visit by trajectory groups

Trajectory group	N	Mean leisure time physical activity (frequency/week)		
		Wave I[a]	Wave II[b]	Wave III[c]
Overall				
1 (decreasing from low activity)	940	2.5	2.3	1.4
2 (decreasing from high activity)	391	4.8	4.8	3.1
3 (increasing activity)	77	4.3	4.2	8.7
Female offspring				
1 (decreasing from low activity)	468	2.5	2.4	1.5
2 (decreasing from high activity)	181	4.7	4.7	3.0
3 (increasing activity)	42	4.5	4.2	8.8
Male offspring				
1 (decreasing from low activity)	472	2.5	2.2	1.4
2 (decreasing from high activity)	210	4.8	4.8	3.2
3 (increasing activity)	35	3.9	4.1	8.5
Normal Weight				
1 (consistently moderate activity)	41	2.2	2.4	6.0
2 (decreasing from low activity)	359	2.1	2.1	1.1
3 (decreasing from high activity)	220	4.7	4.4	2.4
4 (increasing from high activity)	42	5.0	5.5	7.1
Overweight/obese				
1 (consistently low activity)	461	2.5	2.3	1.6
2 (decreasing activity)	193	4.9	4.9	2.9
3 (increasing activity)	41	4.1	4.0	9.4

[a]Wave I data collection occurred 1994-1995 when participants were in grade 7-12 (age 11-21 years).
[b]Wave II data collection occurred in 1996 when participants were age 12-22 years.
[c]Wave III data collection occurred 2001-2002 when participants were age 18-26 years.

Table 4. Mean leisure time sedentary behavior at each study visit by trajectory groups

Overall	N	Mean leisure time sedentary behavior (hours/week)		
		Wave I	Wave II	Wave III
1 (consistently moderate SB)	88	41.2	24.4	41.6
2 (consistently low SB)	1085	14.6	12.9	15.3
3 (decreasing from moderate SB)	175	39.1	40.2	23.6
4 (increasing SB)	33	28.7	31.2	80.4
5 (decreasing from high SB)	27	74.1	73.2	37.1
Female offspring				
1 (consistently moderate SB)	42	38.8	24.3	41.5
2 (consistently low SB)	525	14.5	12.8	15.8
3 (decreasing from moderate SB)	90	41.1	39.4	23.5
4 (increasing SB)	16	21.9	34.2	73.9
5 (decreasing from high SB)	13	77.1	72.7	36.4
Male offspring				
1 (consistently moderate SB)	46	43.5	24.4	41.8
2 (consistently low SB)	556	14.8	12.9	14.9
3 (decreasing from moderate SB)	84	37.0	41.1	23.7
4 (increasing SB)	16	35.4	28.3	87.2
5 (decreasing from high SB)	11	70.6	73.7	37.8
Normal Weight				
1 (consistently low SB)	604	15.8	14.3	15.9
2 (decreasing SB)	58	51.6	41.9	39.6
Overweight/obese				
1 (increasing SB)	29	33.4	30.3	78.6
2 (consistently low SB)	600	18.0	16.0	18.6
3 (decreasing SB)	66	60.2	56.1	26.2

Abbreviations: sedentary behavior, SB

[a]Wave I data collection occurred 1994-1995 when participants were in grade 7-12 (age 11-21 years).

[b]Wave II data collection occurred in 1996 when participants were age 12-22 years.

[c]Wave III data collection occurred 2001-2002 when participants were age 18-26 years.

Table 5. Associations of leisure time physical activity and sedentary behavior trajectory groups with birthweight

		Wald test P value[a]			
		Offspring Sex		Pre-pregnancy BMI	
	Total Population	Females	Males	Normal Weight	Overweight/ obese
			Model I[b]		
Physical activity trajectories	0.66	0.12	0.86	0.41	0.38
Sedentary behavior trajectories	0.85	0.92	0.47	0.88	0.91
			Model II[c]		
Physical activity trajectories	0.60	0.11	0.82	-	-
Sedentary behavior trajectories	0.93	0.88	0.58	-	-

[a]Wald test P-value for joint significance of all physical activity or sedentary behavior trajectories (testing if any coefficient is not equal to 0).
[b]Model I is adjusted for maternal age at delivery (years), race (non-Hispanic white/non-Hispanic black/Hispanic/other), parental income category (<$20K/$20-60K/>$60K), nulliparity (Y/N), smoking during pregnancy (Y/N), alcohol use during pregnancy (Y/N), gestational age at delivery (weeks), and offspring sex.
[c]Model II is adjusted for all covariates in Model I and pre-pregnancy BMI category (underweight/normal weight/overweight/obese).

Table 6. Associations of leisure time physical activity and sedentary behavior trajectory groups with categories of birthweight

| | Total | | Offspring Sex | | | | Pre-pregnancy BMI | | | |
| | | | Females | | Males | | Normal Weight | | Overweight/obese | |
	N	P value[a]	N	P value[a]	N	P value[a]	N	P value[a]	N	P value[a]
					Model I[b]					
Physical activity trajectories										
Small-for-gestational age	110/1372	0.43	52/675	0.87	58/697	0.31	55/654	0.82	49/668	0.22
Large-for-gestational age	216/1372	0.95	102/675	0.07	111/697	0.15	93/654	0.02	121/668	0.66
Sedentary behavior trajectories										
Small-for-gestational age	110/1372	0.47	52/675	0.77	58/697	0.55	55/654	0.52	49/668	0.97
Large-for-gestational age	216/1372	0.61	102/675	<0.001	111/697	<0.001	93/654	0.48	121/668	0.30
					Model II[c]					
Physical activity trajectories										
Small-for-gestational age	110/1372	0.34	52/675	0.73	58/697	0.27	55/654	-	49/668	-
Large-for-gestational age	216/1372	0.95	102/675	0.05	111/697	0.18	93/654	-	121/668	-
Sedentary behavior trajectories										
Small-for-gestational age	110/1372	0.43	52/675	0.51	58/697	0.62	55/654	-	49/668	-
Large-for-gestational age	216/1372	0.64	102/675	<0.001	111/697	<0.001	93/654	-	121/668	-

[a]Wald Test P-value for joint significance of all physical activity or sedentary behavior trajectories (testing if any coefficient is not equal to 0).

[b]Model I is adjusted for maternal age at delivery (years), race (non-Hispanic white/non-Hispanic black/Hispanic/other), parental income category (<$20K/$20-60K/>$60K), nulliparity (Y/N), smoking during pregnancy (Y/N), alcohol use during pregnancy (Y/N), gestational age at delivery (weeks), and offspring sex.

[c]Model II is adjusted for all covariates in Model I and pre-pregnancy BMI category (underweight/normal weight/overweight/obese).

Table 7. GEE sensitivity analysis for associations of leisure time physical activity and sedentary behavior with birthweight

| | Regression coefficient P value[a] | | | | |
| | Offspring Sex | | | Pre-pregnancy BMI | |
	Total	**Females**	**Males**	**Normal Weight**	**Overweight/ obese**
Birthweight (g)					
Physical activity	0.34	0.50	Not estimable	Not estimable	0.40
Sedentary behavior	0.32	0.16	0.79	0.65	0.39
Small-for-gestational age					
Physical activity	Not estimable	0.70	Not estimable	Not estimable	Not estimable
Sedentary behavior	0.87	Not estimable	0.50	Not estimable	0.78
Large-for-gestational age					
Physical activity	0.16	0.66	0.22	0.80	0.09
Sedentary behavior	0.99	0.57	0.71	0.59	0.44

[a]Model is adjusted for maternal age at delivery (years), race (non-Hispanic white/non-Hispanic black/Hispanic/other), parental income category (<$20K/$20-60K/>$60K), nulliparity (Y/N), smoking during pregnancy (Y/N), alcohol use during pregnancy (Y/N), gestational age at delivery (weeks), and offspring sex.

Table 8. Associations of leisure time sedentary behavior trajectory groups with categorical birthweight

	N	SGA Relative Risk (95% CI)		N	LGA Relative Risk (95% CI)	
		Model I[a]	Model II[b]		Model I[a]	Model II[b]
Sedentary behavior trajectory						
OVERALL						
1 (consistently moderate SB)	8/85	0.56 (0.17, 1.84)	0.54 (0.18, 1.64)	8/85	0.59 (0.19, 1.87)	0.61 (0.18, 2.00)
2 (consistently low SB)	82/1056	1.21 (0.53, 2.76)	1.11 (0.48, 2.56)	176/1056	1.23 (0.64, 2.39)	1.33 (0.68, 2.59)
3 (decreasing from moderate SB)	13/171	Reference	Reference	24/171	Reference	Reference
4 (increasing SB)	3/33	1.56 (0.39, 6.29)	1.40 (0.35, 5.60)	4/33	0.75 (0.20, 2.81)	0.87 (0.25, 3.06)
5 (decreasing from high SB)	4/27	2.55 (0.50, 12.9)	2.63 (0.51, 13.4)	4/27	2.19 (0.47, 10.3)	1.94 (0.43, 8.77)
FEMALES						
1 (consistently moderate SB)	3/41	0.74 (0.13, 4.09)	0.47 (0.10, 2.13)	4/41	1.12 (0.32, 3.86)	1.07 (0.27, 4.18)
2 (consistently low SB)	41/512	1.42 (0.48, 4.18)	1.04 90.34, 3.15)	83/512	1.96 (0.68, 5.66)	2.17 (0.72, 6.53)
3 (decreasing from moderate SB)	6/91	Reference	Reference	11/91	Reference	Reference
4 (increasing SB)[c]	-	-	1.66 (0.15, 17.9)	4/17	2.99 (0.75, 11.9)	3.47 (0.90, 13.4)
5 (decreasing from high SB)[c]	-	-	3.07 (0.24, 40.0)	0/14	Not estimated	Not estimated
MALES						
1 (consistently moderate SB)	5/44	0.41 (0.09, 2.00)	0.43 (0.09, 2.07)	4/44	0.42 (0.09, 2.00)	0.46 (0.10, 2.13)
2 (consistently low SB)	41/544	0.99 (0.35, 2.76)	1.03 (0.36, 2.93)	93/544	0.91 (0.46, 1.83)	0.96 (0.48, 1.92)
3 (decreasing from moderate SB)	7/80	Reference	Reference	13/80	Reference	Reference
4 (increasing SB)[c]	-	-	1.53 (0.28, 8.31)	0/16	Not estimated	Not estimated
5 (decreasing from high SB)	3/13	2.20 (0.30, 16.4)	1.96 (0.26, 14.7)	4/13	4.53 (0.72, 28.7)	3.90 (0.65, 23.3)

P value for interaction= Model does not converge

[a]Model I is adjusted for maternal age at delivery (years), race (non-Hispanic white/non-Hispanic black/Hispanic/other), parental income category (<$20K/$20-60K/>$60K), nulliparity (Y/N), smoking during pregnancy (Y/N), alcohol use during pregnancy (Y/N), gestational age at delivery (weeks), and offspring sex.

[b]Model II is adjusted for all covariates in Model I and pre-pregnancy BMI category (underweight/normal weight/overweight/obese).

[c]Number of SGA in this category is too small (<3), so cannot show estimate according to Add Health rules.