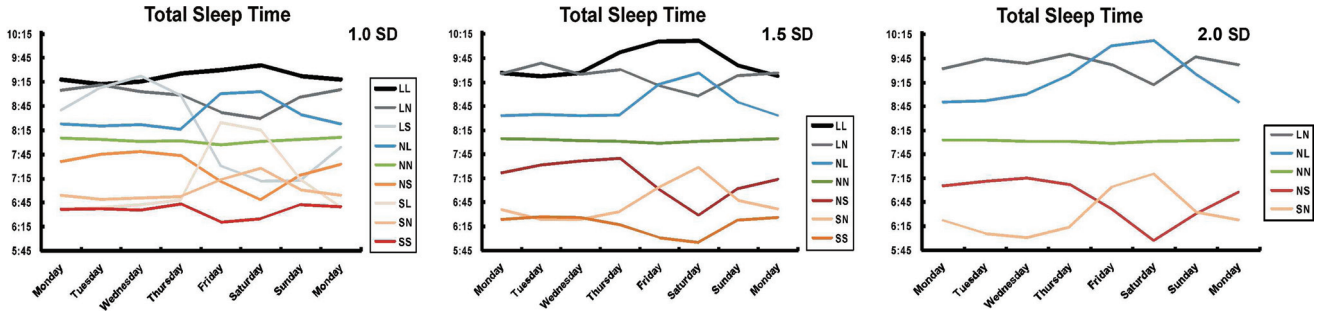
Supplemental Information



SUPPLEMENTAL FIGURE 4
One-week trends of sleep durations for the 9 sleep pattern subgroups determined with 1-SD, 1.5-SD, and 2-SD cutoff values.

SUPPLEMENTAL TABLE 5 TST and SV Values for Normal-Weight, Overweight, and Obese Children

	Week	School Days	Weekend Days	School Days vs Weekend Days	
				t	*P*
Normal-weight ($N = 155$)					
TST, min					
Mean ± SD (95% CI)	482 ± 43 (475–489)	481 ± 46 (474–488)	485 ± 53 (476–493)	−0.6	.53
Median (range)	482 (384–589)	484 (366–605)	487 (347–641)		
SV, %	10.11 ± 5.02	8.8 ± 5.4	9.9 ± 8.9	−1.3	.20
Overweight ($N = 53$)					
TST, min					
Mean ± SD (95% CI)	491 ± 46 (478–504)	490 ± 46 (477–503)	495 ± 69 (476–514)	−0.4	.69
Median (range)	497 (368–591)	494 (370–588)	493 (354–656)		
SV, %	9.8 ± 4.5	8.6 ± 5.5	7.8 ± 6	0.7	.49
Obese ($N = 100$)					
TST, min					
Mean ± SD (95% CI)	473 ± 45 (464–482)	477 ± 49 (467–487)	465 ± 63 (453–478)	1.5	.15
Median (range)	473 (349– 591)	475 (310–614)	470 (264–603)		
SV, %	9.8 ± 4.5	9.2 ± 4.7	11.5 ± 8.3	2.4	.016
Analysis of covariance[a]					
$F_{2,307}$	1.8	0.9	3.5		
P	.17	.40	.03		

[a] The covariate was age.

SUPPLEMENTAL TABLE 6 Partial Correlations Between BMI *z* Scores and Sleep Durations for Normal-Weight, Overweight, and Obese Children

	Correlation With BMI *z* Scores		
	Normal-Weight ($N = 155$)	Overweight ($N = 53$)	Obese ($N = 100$)
Mean TST			
Week	−0.10	0.31[a]	−0.04
School days	−0.08	0.24	−0.06
Weekend days	−0.11	0.29[a]	0.01
SV			
Week	−0.09	0.05	−0.11
School days	−0.10	−0.14	−0.15
Weekend days	−0.06	0.16	−0.0001

Correlations were controlled for age.
[a] Significant at $P < .05$.

SUPPLEMENTAL TABLE 7 Partial Correlations Between Metabolic Marker Levels and Sleep Durations for Normal-Weight, Overweight, and Obese Children

	Correlation						
	Glucose Level	Insulin Level	Triglyceride Level	Cholesterol Level	HDL Level	LDL Level	CRP Level
Mean TST							
Week							
Normal-weight ($n = 44$)	0.11	−0.02	0.004	−0.003	0.06	−0.03	0.09
Overweight ($n = 16$)	0.03	0.09	0.04	0.21	0.13	0.21	−0.12
Obese ($n = 47$)	−0.04	−0.22	−0.15	−0.004	0.017	−0.03	−0.07
School days							
Normal-weight ($n = 44$)	0.09	0.01	0.01	0.01	0.06	−0.03	0.02
Overweight ($n = 16$)	0.02	0.18	0.02	0.18	0.11	0.19	0.04
Obese ($n = 47$)	−0.05	−0.17	−0.11	−0.05	0.1	−0.07	−0.18
Weekend days							
Normal-weight ($n = 44$)	0.09	−0.09	−0.08	−0.09	0.002	−0.09	0.24
Overweight ($n = 16$)	0.02	−0.08	0.02	0.18	0.11	0.2	−0.3
Obese ($n = 47$)	−0.03	−0.21	−0.19	0.07	0.2	0.07	0.14
SV							
Week							
Normal-weight ($n = 44$)	−0.03	0.1	−0.07	−0.08	−0.08	−0.04	−0.13
Overweight ($n = 16$)	−0.24	−0.03	−0.19	0.14	0.12	0.19	0.07
Obese ($n = 47$)	−0.13	0.09	0.10	0.19	0.22	0.09	−0.24
School days							
Normal-weight ($n = 44$)	0.02	0.16	−0.03	−0.07	−0.06	−0.04	−0.13
Overweight ($n = 16$)	−0.33	0.07	0.003	0.32	0.2	0.33	−0.01
Obese ($n = 47$)	−0.14	0.07	0.31[a]	0.22	0.19	0.08	−0.18
Weekend days							
Normal-weight ($n = 35$)	−0.11	−0.07	−0.07	−0.2	−0.13	−0.16	−0.33
Overweight ($n = 16$)	0.42	−0.01	−0.39	−0.23	−0.07	−0.17	0.18
Obese ($n = 45$)	−0.05	−0.05	−0.26	−0.05	0.28	−0.1	0.05

Correlations were controlled for age.
[a] Significant at $P < .05$.

SUPPLEMENTAL TABLE 8 Demographic Features, BMI *z* Scores, and RDI Values for 9 Sleep Pattern Subgroups, With 1-SD, 1.5-SD, and 2-SD Cutoff Values

Subgroup	*n*	Age, Mean ± SD, y	Female, %	Race/Ethnicity, %			BMI *z* Score, Mean ± SD	RDI, Mean ± SD
				Non-Hispanic White	Black	Other		
1 SD[a]								
SS	16	7.4 ± 1.6	1.6	2.6	2.3	0.3	1.2 ± 1.3	2.9 ± 4.6
SN	27	7.4 ± 1.3	6.2	5.6	2.0	1.3	1.1 ± 1.1	1.2 ± 1.3
SL	3	6.8 ± 0.5	0.3	0.7	0.0	0.3	0.3 ± 1.3	1.1 ± 0.6
NS	25	8.0 ± 1.3	3.9	5.2	1.0	2.0	1.3 ± 1.0	2.7 ± 6.5
NN	163	7.0 ± 1.3	25.8	39.2	10.5	3.6	1.1 ± 1.1	1.3 ± 2.6
NL	29	7.3 ± 1.2	6.2	6.5	1.6	1.3	0.8 ± 1.1	1.3 ± 1.6
LS	2	6.8 ± 0.6	0.3	0.0	0.7	0.0	2.1 ± 0.5	0.7 ± 0.1
LN	23	6.8 ± 1.3	3.9	6.9	0.3	0.3	0.9 ± 1.2	1.5 ± 2.1
LL	18	6.9 ± 1.1	2.6	4.9	0.7	0.3	1.0 ± 1.2	0.7 ± 0.6
1.5 SDs[b]								
SS	7	7.1 ± 1.1	1	1	1.3	0	1.9 ± 1.1	4.6 ± 6.5
SN	15	7.5 ± 1.2	2.6	3.3	1.3	0.3	0.7 ± 1.3	1.3 ± 1.2
NS	13	8.4 ± 1.5	2.3	2	1	1.3	1.6 ± 0.9	4 ± 8.5
NN	241	7.1 ± 1.3	39.5	58.5	13.1	7.2	1.0 ± 1.1	1.2 ± 2.3
NL	13	7.7 ± 1.5	2	2.3	1.3	0.7	1.1 ± 1.0	0.9 ± 0.6
LN	11	6.7 ± 1.8	2.3	3.3	0.3	0	1.2 ± 1.3	1.3 ± 2.7
LL	6	7.4 ± 0.8	1.3	1.3	0.7	0	1.2 ± 1.4	0.9 ± 0.7
2 SDs[c]								
SN	7	7.7 ± 1.4	0.7	1.3	0.7	0.3	0.9 ± 1.3	0.9 ± 0.6
NS	8	8.2 ± 1.5	1	1.3	1.0	0.3	2.2 ± 0.8	5.3 ± 6.1
NN	278	7.1 ± 1.3	46.4	65	17.0	8.8	1.0 ± 1.1	1.35 ± 2.9
NL	5	7.6 ± 1.2	1	1.3	0.3	0	1.1 ± 1.1	0.8 ± 0.8
LN	6	6.8 ± 0.6	1.6	2.0	0	0	1.2 ± 1.0	1.9 ± 3.5

[a] Age: $F_{8,297} = 2.1$; $P = .04$ for NS group versus NN group and NS group versus LN group; BMI *z* score: $F_{8,297} = 0.8$; $P = .59$; gender: $\chi^2_8 = 10.2$; $P = .25$; race/ethnicity: too few cells with sufficient numbers of subjects; when other race was excluded, a tendency existed for more black children in the SS and LS groups, in comparison with non-Hispanic white children; RDI: $F_{8,236} = 1.1$; $P = .39$.

[b] Age: $F_{6,299} = 2.9$; $P = .01$ for NS group versus NN group and NS group versus LN group; BMI *z* score: $F_{6,299} = 1.5$; $P = .19$; gender: $\chi^2_6 = 1.7$; $P = .92$; race/ethnicity: $\chi^2_6 = 10.9$; $P = .09$ when only black and non-Hispanic white children were compared; RDI: $F_{6,238} = 2.9$; $P = .01$; in posthoc tests, no differences were found.

[c] Age: $F_{6,299} = 1.3$; $P = .26$; BMI *z* score: $F_{6,299} = 1.7$; $P = .12$; gender: $\chi^2_6 = 6.7$; $P = .35$; race/ethnicity: $\chi^2_6 = 4.7$; $P = .6$ when black and non-Hispanic white children were compared; RDI: $F_{6,238} = 2.1$; $P = .06$.

SUPPLEMENTAL TABLE 9 TST and SV Values for 9 Sleep Pattern Subgroups, With 1-SD, 1.5-SD, and 2-SD Cutoff Values

	TST, Mean ± SD, min			SV, Mean ± SD, %		
	Week	School Days	Weekend Days	Week	School Days	Weekend Days
1 SD						
SS	396 ± 21	405 ± 19	373 ± 39	12.7 ± 4.9	10.9 ± 5.5	12.6 ± 11
SN	421 ± 19	406 ± 27	460 ± 21	11.8 ± 4.5	9.1 ± 5.0	11.5 ± 7.8
SL	431 ± 26	391 ± 28	558 ± 09	20.4 ± 5.1	9.0 ± 4.7	16.4 ± 3.8
NS	446 ± 20	469 ± 24	387 ± 27	13.8 ± 4.7	9.6 ± 4.9	15.2 ± 10.3
NN[a]	483 ± 22	484 ± 26	479 ± 32	9.3 ± 4.6	8.6 ± 5.2	9.3 ± 7.9
NL	514 ± 18	493 ± 21	568 ± 21	11.5 ± 3.3	8.2 ± 4.1	10.7 ± 7.9
LS	493 ± 17	549 ± 00	388 ± 13	19.5 ± 1.6	9.9 ± 2.9	9.1 ± 2.3
LN	535 ± 20	550 ± 21	499 ± 26	11.7 ± 4.9	10.7 ± 7.4	9.0 ± 8.3
LL	564 ± 19	558 ± 20	578 ± 31	7.7 ± 3.9	7.9 ± 4.6	6.0 ± 6.2
1.5 SDs						
SS	377 ± 15	391 ± 12	344 ± 40	13.5 ± 4.8	11.3 ± 6.3	11.0 ± 7.1
SN	405 ± 19	382 ± 23	471 ± 45	16.7 ± 4.7	12.3 ± 4.6	14.8 ± 11.0
NS	433 ± 26	463 ± 37	361 ± 20	15.7 ± 4.3	10.5 ± 4.7	11.8 ± 10.0
NN[a]	482 ± 30	483 ± 34	480 ± 43	9.8 ± 4.6	8.7 ± 5.3	10.0 ± 8.2
NL	529 ± 20	505 ± 27	588 ± 16	11.6 ± 3.8	7.6 ± 2.8	11.4 ± 8.5
LN	562 ± 19	576 ± 20	527 ± 25	8.9 ± 4.1	8.1 ± 5.0	6.6 ± 6.0
LL	583 ± 04	569 ± 09	614 ± 27	8.0 ± 5.3	8.6 ± 6.4	2.9 ± 2.8
2 SDs						
SN	390 ± 23	362 ± 23	471 ± 70	18.0 ± 6.1	13.2 ± 3.1	9.0 ± 5.8
NS	405 ± 37	434 ± 39	331 ± 29	17.0 ± 2.7	10.0 ± 5.4	16.5 ± 9.6
NN[a]	482 ± 36	482 ± 39	481 ± 51	10.2 ± 4.7	8.8 ± 5.3	10.2 ± 8.4
NL	565 ± 26	539 ± 32	627 ± 23	11.8 ± 4.3	10.4 ± 6.4	4.2 ± 3.1
LN	579 ± 14	592 ± 14	543 ± 33	8.2 ± 3.4	7.6 ± 3.2	5.4 ± 3.5

TST values were controlled for age.

[a] Mean of sample.