

Table S1

PCA Solution with Oblique Rotation for Child Sleep Variables at Wave Two

	Component				Item
	1	2	3	4	Residual
1. <i>Sleep Activity</i>					
Average time awake after sleep onset	0.96	0.06	0.00	0.01	0.05
Average minute-to-minute activity level (<i>SD</i>)	0.94	-0.06	0.05	0.02	0.14
Average number of awakenings lasting 5 or more minutes	0.89	-0.08	0.00	-0.14	0.17
Average duration of longest wake episode after sleep onset	0.89	0.15	-0.05	0.22	0.16
Average percent of active epochs after sleep onset	0.68	-0.03	0.07	-0.30	0.37
2. <i>Sleep Variability</i>					
Time of sleep onset (<i>SD</i>)	-0.14	0.86	0.11	-0.01	0.24
Duration of time in bed (<i>SD</i>)	0.11	0.84	-0.07	0.04	0.28
Duration of sleep period (<i>SD</i>)	0.10	0.88	-0.06	0.01	0.20
Time of midsleep (<i>SD</i>)	0.06	0.72	0.25	0.13	0.35
Bedtime (<i>SD</i>)	-0.18	0.77	0.13	-0.10	0.35
Minutes asleep while in bed (<i>SD</i>)	0.09	0.80	-0.19	-0.13	0.31
3. <i>Sleep Timing</i>					
Average time of midsleep	0.04	0.01	1.01	0.24	0.02
Average time of sleep onset	0.03	0.00	0.90	-0.21	0.04
Average bedtime	-0.06	0.05	0.85	-0.24	0.11
4. <i>Sleep Duration</i>					
Average sleep period	-0.01	-0.01	-0.11	0.93	0.07
Average duration of time in bed	0.11	-0.04	0.04	0.96	0.12
Average minutes asleep while in bed	-0.48	-0.06	-0.06	0.73	0.06
Proportion of variance explained	.25	.24	.17	.16	

Note. $n = 107$, values in bold indicated strongest loading, rotation = oblimin.

Table S2

PCA Solution with Oblique Rotation for Child Sleep Variables at Wave Three

	Component				Item
	1	2	3	4	Residual
1. Sleep Activity					
Average time awake after sleep onset	0.99	0.00	0.01	0.10	0.05
Average minute-to-minute activity level (SD)	0.92	0.00	-0.06	-0.03	0.16
Average number of awakenings lasting 5 or more minutes	0.93	-0.04	-0.05	0.02	0.15
Average duration of longest wake episode after sleep onset	0.87	0.02	0.08	0.16	0.25
Average percent of active epochs after Sleep onset	0.74	0.10	-0.05	-0.20	0.35
2. Sleep Variability					
Time of sleep onset (SD)	-0.08	0.87	-0.09	0.00	0.28
Duration of time in bed (SD)	0.07	0.80	0.01	-0.04	0.33
Duration of sleep period (SD)	0.05	0.81	0.10	0.03	0.28
Time of midsleep (SD)	0.01	0.66	0.15	0.25	0.44
Bedtime (SD)	-0.15	0.77	-0.04	-0.06	0.43
Minutes asleep while in bed (SD)	0.13	0.76	-0.01	-0.08	0.39
3. Sleep Timing					
Average time of midsleep	0.00	0.02	1.01	0.22	0.02
Average time of sleep onset	0.05	0.02	0.92	-0.20	0.03
Average bedtime	-0.08	-0.01	0.93	-0.14	0.07
4. Sleep Duration					
Average sleep period	-0.03	-0.02	-0.08	0.94	0.07
Average duration of time in bed	0.15	0.03	-0.01	0.96	0.09
Average minutes asleep while in bed	-0.64	0.00	-0.08	0.62	0.05
Proportion of variance explained	.27	.22	.17	.15	

Note. $n = 104$, values in bold indicated strongest loading, rotation = oblimin.

Table S3

PCA Solution with Oblique Rotation for Mother Sleep Variables at Wave One

	Component				Item
	1	2	3	4	Residual
1. Sleep Activity					
Average time awake after sleep onset	0.98	0.01	-0.04	0.04	0.03
Average minute-to-minute activity level (SD)	0.91	-0.06	0.08	0.04	0.18
Average number of awakenings lasting 5 or more minutes	0.92	-0.06	-0.03	-0.02	0.16
Average duration of longest wake episode after sleep onset	0.91	0.08	0.02	0.02	0.14
Average percent of active epochs after sleep onset	0.76	0.05	-0.02	-0.06	0.39
2. Sleep Variability					
Time of sleep onset (SD)	0.10	0.79	0.01	-0.09	0.29
Duration of time in bed (SD)	-0.13	0.86	0.03	0.05	0.28
Duration of sleep period (SD)	0.04	0.86	0.03	-0.01	0.22
Time of midsleep (SD)	0.03	0.81	-0.10	-0.16	0.31
Bedtime (SD)	-0.09	0.83	-0.03	0.01	0.35
Minutes asleep while in bed (SD)	0.08	0.76	0.11	0.19	0.38
3. Sleep Timing					
Average time of midsleep	0.05	0.01	1.04	0.20	0.02
Average time of sleep onset	0.02	0.04	0.86	-0.24	0.02
Average bedtime	-0.11	0.00	0.86	-0.22	0.06
4. Sleep Duration					
Average sleep period	0.03	-0.06	-0.08	0.94	0.03
Average duration of time in bed	0.20	0.02	-0.05	0.93	0.10
Average minutes asleep while in bed	-0.49	-0.07	-0.06	0.77	0.03
Proportion of variance explained	.26	.24	.16	.16	

Note. $n = 122$, values in bold indicated strongest loading, rotation = oblimin.

Table S4

PCA Solution with Oblique Rotation for Mother Sleep Variables at Wave Two

	Component				Item
	1	2	3	4	Residual
1. <i>Sleep Activity</i>					
Average time awake after sleep onset	0.97	0.04	-0.02	0.12	0.05
Average minute-to-minute activity level (<i>SD</i>)	0.94	0.01	-0.01	-0.01	0.11
Average number of awakenings lasting 5 or more minutes	0.92	-0.02	0.00	0.08	0.17
Average duration of longest wake episode after sleep onset	0.88	0.06	0.00	-0.09	0.18
Average percent of active epochs after sleep onset	0.75	-0.13	0.10	-0.05	0.43
2. <i>Sleep Variability</i>					
Time of sleep onset (<i>SD</i>)	0.03	0.89	-0.02	-0.04	0.19
Duration of time in bed (<i>SD</i>)	0.02	0.84	0.02	0.02	0.28
Duration of sleep period (<i>SD</i>)	0.08	0.82	0.02	0.03	0.29
Time of midsleep (<i>SD</i>)	-0.08	0.73	0.12	0.01	0.43
Bedtime (<i>SD</i>)	-0.16	0.85	0.05	0.00	0.29
Minutes asleep while in bed (<i>SD</i>)	0.12	0.75	-0.14	0.00	0.44
3. <i>Sleep Timing</i>					
Average time of midsleep	0.03	0.00	1.02	0.20	0.05
Average time of sleep onset	0.03	0.05	0.91	-0.12	0.04
Average bedtime	-0.07	0.01	0.86	-0.24	0.06
4. <i>Sleep Duration</i>					
Average sleep period	0.02	-0.06	-0.06	0.94	0.04
Average duration of time in bed	0.14	0.02	0.00	0.99	0.04
Average minutes asleep while in bed	-0.54	-0.07	-0.08	0.70	0.03
Proportion of variance explained	.26	.24	.16	.15	

Note. $n = 111$, values in bold indicated strongest loading, rotation = oblimin.

Table S5

PCA Solution with Oblique Rotation for Mother Sleep Variables at Wave Three

	Component				Item
	1	2	3	4	Residual
1. <i>Sleep Activity</i>					
Average time awake after sleep onset	0.98	0.00	-0.06	0.00	0.05
Average minute-to-minute activity level (<i>SD</i>)	0.93	0.00	0.02	0.05	0.13
Average number of awakenings lasting 5 or more minutes	0.93	0.04	-0.06	0.04	0.13
Average duration of longest wake episode after sleep onset	0.90	0.02	0.02	-0.03	0.18
Average percent of active epochs after sleep onset	0.72	-0.23	-0.01	-0.05	0.44
2. <i>Sleep Variability</i>					
Time of sleep onset (<i>SD</i>)	0.15	0.88	0.03	0.09	0.17
Duration of time in bed (<i>SD</i>)	-0.16	0.85	0.00	-0.06	0.25
Duration of sleep period (<i>SD</i>)	0.01	0.92	-0.07	-0.07	0.18
Time of midsleep (<i>SD</i>)	0.22	0.57	0.33	0.33	0.38
Bedtime (<i>SD</i>)	-0.06	0.84	0.04	0.03	0.28
Minutes asleep while in bed (<i>SD</i>)	-0.06	0.87	-0.05	-0.12	0.25
3. <i>Sleep Timing</i>					
Average time of midsleep	0.00	-0.09	0.96	0.12	0.18
Average time of sleep onset	0.00	0.06	0.89	-0.13	0.08
Average bedtime	-0.12	0.03	0.83	-0.18	0.16
4. <i>Sleep Duration</i>					
Average sleep period	-0.02	-0.07	-0.14	0.86	0.15
Average duration of time in bed	0.18	0.02	-0.02	0.94	0.08
Average minutes asleep while in bed	-0.54	-0.05	-0.09	0.74	0.07
Proportion of variance explained	.26	.25	.16	.14	

Note. $n = 107$, values in bold indicated strongest loading, rotation = oblimin

Table S6

Chronbach's alpha with (95% CI) for Sleep Composites by Age for Children and Mothers.

Assessment	Sleep Activity	Sleep Variability	Sleep Timing	Sleep Duration
<i>Children</i>				
Wave 1	0.93 (0.86-1.00)	0.88 (0.81-0.96)	0.95 (0.84-1.00)	0.90 (0.78-0.93)
Wave 2	0.93 (0.86-1.00)	0.89 (0.82-0.97)	0.95 (0.83-1.00)	0.90 (0.86-1.00)
Wave 3	0.93 (0.85-1.00)	0.90 (0.82-0.98)	0.95 (0.82-1.00)	0.92 (0.78-1.00)
<i>Mother</i>				
Wave 1	0.92 (0.84-1.00)	0.89 (0.82-0.97)	0.93 (0.80-0.96)	0.92 (0.79-1.00)
Wave 2	0.93 (0.85-1.00)	0.87 (0.78-0.96)	0.96 (0.84-1.00)	0.89 (0.74-1.00)
Wave 3	0.93 (0.85-1.00)	0.90 (0.82-0.98)	0.90 (0.76-1.00)	0.89 (0.75-1.00)

Note. 95% Confidence Interval was based on a bootstrap estimate from 1,000 samples

Table S7

Standardized Parameter Estimates (Standard Error) Predicting Lag 1 Effects Separately for Individual and Composite Child Sleep Variables

	<u>Sleep Activity</u>		<u>Sleep Variability</u>		<u>Sleep Timing</u>		<u>Sleep Duration</u>	
	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
<i>Fixed Effects</i>								
Intercept	-.15(.07)	-.16(.06)	.00(.74)	-.01(.05)	.07(.09)	.05(.05)	.05(.08)	.06(.07)
Lag 1	.00(.03)	.21(.07)**	-.08(.03)*	.38(.77)***	.06(.04)	.70(.06)***	.06(.04)	.38(.07)***
<i>Random Effects</i>								
Intercept (SD)	.69	.20	.71	.00	.75	.00	.76	.29
Residual (SD)	.66	.75	.63	.62	.29	.65	.62	.76

Note. Mixed effects models were estimated by regressing lagged sleep variables at time $t+1$ on the same sleep variable at the previous time point, t . Thus, the model examined the rank-order stability across time of each of the individual sleep indexes and the higher-order sleep composites. To accomplish this aim, the data were structured with three columns for each model: (1) the child's sleep variable score at a given time point, t , (2) the child's sleep variable score at the next time point, $t+1$, and (3) the child's participant number (within which the repeated measures were nested). Only one-wave lags were included in the model (i.e., the sleep variable at 30 months predicting the same sleep variable at 36 months, or the sleep variable at 36 months predicting the same sleep variable at 42 months).

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table S8

Standardized Parameter Estimates (Standard Error) Predicting Lag 1 Effects Separately for Individual and Composite Mother Sleep Variables

	<u>Sleep Activity</u>		<u>Sleep Variability</u>		<u>Sleep Timing</u>		<u>Sleep Duration</u>	
	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>	<u>Variables</u>	<u>Composite</u>
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
<i>Fixed Effects</i>								
Intercept	.01(.07)	-.02(.06)	.01(.08)	-.02(.05)	.06(.07)	.07(.05)	-.06(.58)	-.06(.05)
Lag 1	.35(.05)***	.52(.06)***	.00(.04)	.38(.08)***	.30(.05)***	.76(.05)***	.31(.04)***	.60(.06)***
<i>Random Effects</i>								
Intercept (SD)	.52	.00	.73	.00	.68	.00	.51	.00
Residual (SD)	.74	.74	.78	.66	.53	.64	.66	.70

Note. Mixed effects models were estimated by regressing lagged sleep variables at time $t+1$ on the same sleep variable at the previous time point, t . Thus, the model examined the rank-order stability across time of each of the individual sleep indexes and the higher-order sleep composites. To accomplish this aim, the data were structured with three columns for each model: (1) the child's sleep variable score at a given time point, t , (2) the child's sleep variable score at the next time point, $t+1$, and (3) the child's participant number (within which the repeated measures were nested). Only one-wave lags were included in the model (i.e., the sleep variable at 30 months predicting the same sleep variable at 36 months, or the sleep variable at 36 months predicting the same sleep variable at 42 months).

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$ * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$