Supplemental Material 1. General equation for a mixed-effects regression model regressing sleep on screen time, presented unadjusted for covariates.[1]

$$y_{ti} = (\beta_0 + \mu_{0i}) + \beta_1 \bar{z}_i + \beta_2 \dot{z}_{ti} + (\beta_3 + \mu_{3i}) age_{ti} + \epsilon_{ti}$$

Where

t = Study timepoint (approximately 3, 6, 9, or 12 months post-partum)

i = Indicator for each infant (i = 1,…,588)

y_{ti} = sleep outcome for infant i at time t

$\bar{z}_i$ = Average daily screen time over the study period for infant i (for the between-infant effect)

$\dot{z}_{ti}$= Deviation in the observed value of daily screen time from the expected value of daily screen time for infant i at time t. Values are computed using a simple linear regression model for each infant, where screen time is regressed on age. Each $\dot{z}_{ti}$ value is a residual from the model for infant i. Specifically, $\dot{z}_{ti}$ is the observed value of screen time for infant i at time t minus the expected value of screen time for infant i at time t, where the expected values are from each infant's linear regression model (for the within-infant effect). This process is the process of "detrending."[1]

age_{ti} = Age at time t for infant i (i.e., the time variable)

β_0 = Grand mean for the sleep outcome

μ_{0i} = Contribution to the sleep outcome in addition to the grand mean for infant i (i.e., random effect for the intercept)

β_1 = Association between the average daily screen time over the study period and the sleep outcome (i.e., the between-infant effect)

β_2 = Association between the deviation in expected screen time at time t and the sleep outcome (i.e., the within-infant effect)

β_3 = Association between age and the sleep outcome (i.e., slope for time)

μ_{3i} = Contribution to the association between age and the sleep outcome for infant i (i.e., random slope for time)

ϵ_{ti} = Error term for infant i at time t (i.e., model residual)

…and

$\mu_0 = N(0, \sigma_{\mu_0})$

$\mu_3 = N(0, \sigma_{\mu 3})$

$\epsilon = N(0, \sigma_{\epsilon})$

[1] Curran PJ, Bauer DJ. The Disaggregation of Within-Person and Between-Person Effects in Longitudinal Models of Change. *Annu Rev Psychol*. 2011;62:583-619.