Supplementary File IV for Bursty, irregular speech input to children predicts vocabulary size

Margaret Cychosz[1], Rachel R. Romeo[2,3], Jan R. Edwards[2], and Rochelle Newman[2]

[1]Department of Linguistics, University of California, Los Angeles

[2]Department of Hearing and Speech Sciences, University of Maryland, College Park

[3]Department of Human Development and Quantitative Methodology, University of Maryland-College Park

1 The relationship between naps and vocabulary outcomes

Here we evaluate the relationship between nap duration and concurrent vocabulary size. Here we assume that the duration of the child's nap during the recording is representative of their typical nap duration. We first removed recordings that did not contain any sleep (N=3). We could not reliably distinguish between potential overnight sleep and naptimes, so we then removed all recordings that contained nighttime sleep epochs (recorded overnight) to be maximally conservative. We also removed this because we did not have data on the duration of children's typical overnight sleep (the recorder was either turned off when the child went to bed or the battery would run out shortly after). This resulted in N=115 remaining recordings from N=108 children.

To model the relationship between nap duration and concurrent vocabulary size, we fit a baseline linear mixed effects model to predict children's vocabulary size for the N=115 recordings. The baseline model included a random intercept for child and fixed effects of Child Age (in months, centered and scaled), Maternal Education (centered and scaled), and Child Gender (contrast coded). To this model we added an effect of Nap Duration (centered and scaled) which improved upon the baseline model (χ^2=3.88, p=.048). The model summary is listed in Table 1. There was a significant, positive relationship between nap duration and concurrent vocabulary (β=0.16, p=.03), suggesting that children who tend to take longer naps may have larger receptive vocabularies.

Table 1

The relationship between nap duration and concurrent vocabulary size

Intercept	107.28
	(103.47, 111.09)
	t = 55.15
	p < .001***
Age (mos)	2.31
	(1.69, 2.93)
	t = 7.34
	p < .001 ***
Gender:Female	5.63*
	(0.20, 11.06)
	t = 2.03
	p = 0.05
Mat. Ed.	4.20
	(1.93, 6.46)
	t = 3.64
	p = 0.0003***
Nap Duration (mins)	0.16
	(0.001, 0.32)
	t = 1.97
	p = 0.05*
Log Likelihood	−454.00
Akaike Inf. Crit.	921.99
Bayesian Inf. Crit.	941.08

Note: *p<0.05; **p<0.01; ***p<0.001