

INTRODUCTION

Children's linguistic environments are important predictors of their later language development (Hart & Risley, 1992; Weisleder & Fernald, 2013). Children from more language-rich environments have larger, faster-growing vocabularies & greater school readiness. However, only a few studies have investigated the role of children's own vocalizations in this process (e.g., Caskey et al., 2011; Gilkerson et al., 2017; McNew et al., 2017).

Children's vocalizations provide practice with the sounds of their native language as well as opportunities for social responsiveness, conversational turn-taking, linguistic input, and shaping of productive speech (e.g., Warlaumont et al., 2014; Goldstein & Schwade, 2008). The primary goal of the present study was to longitudinally assess the effects of parent language input in early development (3 months) on the amount of child vocalizations in later development (18 months).

Data on parent language input are typically collected in the home and are time-consuming and labor-intensive to collect. However, recent research has demonstrated that individual differences in the amount of parent input are stable across naturalistic and structured play contexts (Tamis-LeMonda et al., 2017). This suggests laboratory-based interactions provide a viable context for indexing individual differences in children's typical language environments. We thus assessed parent language input and child vocalizations across development in a short, lab-based interaction. A secondary goal was to examine stability in parent input across 3-18 months.

METHODS

Twenty-two infants (13 female, 9 male) were tested at 3 and 18 months in an 8 to 10-minute lab-based parent-child free-play interaction (Figure 1). Interactions were recorded using the Language ENvironment Analysis (LENA) system. Automated counts of adult words and child vocalizations from LENA output were obtained and converted to per-minute rates.



Figure 1. Static images of a mother and child participating in the free-play interaction.

RESULTS

Average rates of adult words & child vocalizations (Table 1) did not differ between 3- and 18-months, $ps > .10$.

Table 1. Descriptive Statistics for Rates of Adult Words & Child Vocalizations per Minute

Measure	Age	M (SD)	Range
Adult Words	3 Months	42.1 (42.2)	0.00-166.0
	18 Months	49.4 (28.6)	0.98-118.6
Child Vocalizations	3 Months	0.4 (0.3)	0.0-1.2
	18 Months	0.7 (0.7)	0.0-3.0

Adult words per minute at 3 minutes were highly correlated with both adult words at 18 months, $r = .58$, $p = .004$ (Figure 2a) and child vocalizations per minute at 18 months $r = .85$, $p < .001$ (Figure 2b). Child vocalizations at 3 months were unrelated to all other variables ($ps > .25$), and were therefore excluded from further analyses. Regression analyses revealed that adult words at 3 months remained a significant predictor of child vocalizations at 18 months, even when controlling for adult words at 18 months, $b = .011$, $SE = .002$, $p < .001$. Surprisingly, adult words at 3 and 18 months together accounted for 81.3% of the total variance in child vocalizations at 18 months, $\beta_3 = .49$ & $\beta_{18} = .48$, $ps = .002$ for 3 and 18 months, respectively.

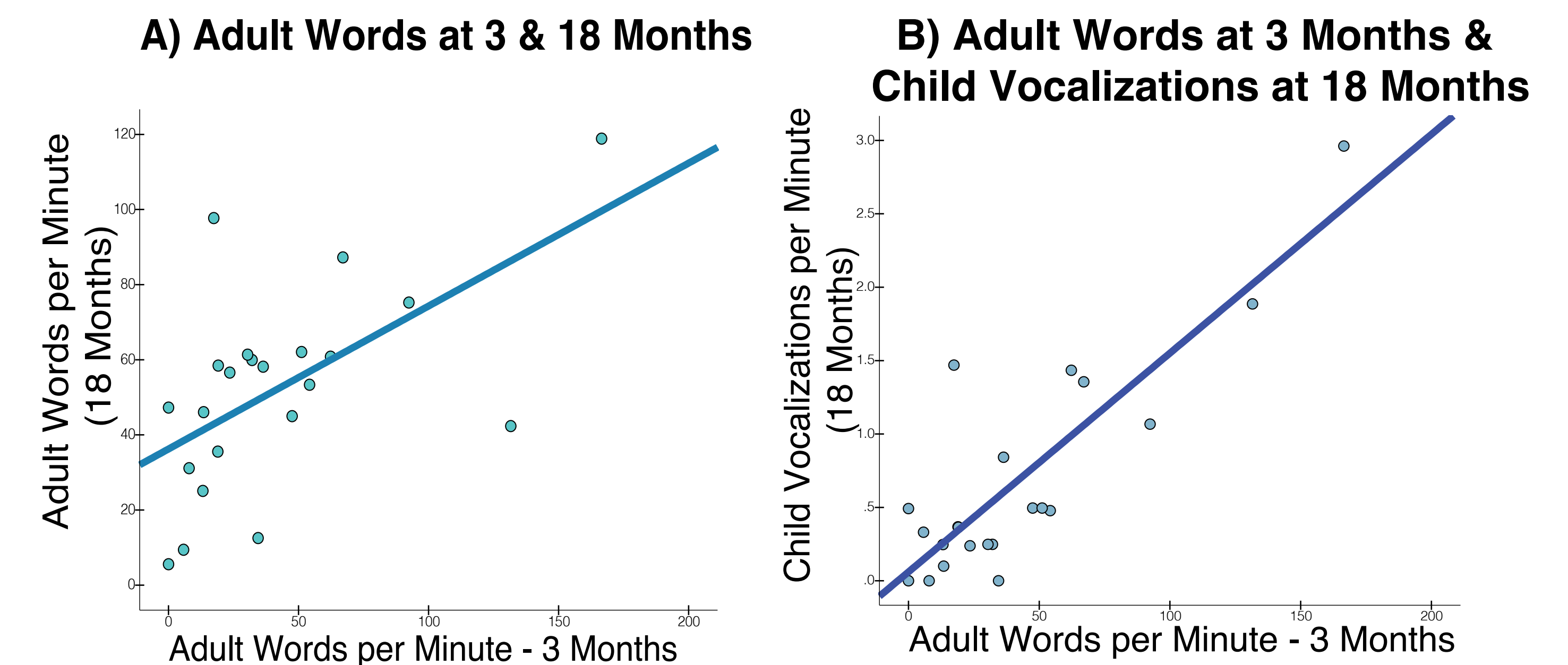


Figure 2. Scatterplots depicting relations between adult words per minute at 3 months and (A) adult words at 18 months and (B) child vocalizations at 18 months. Each point represents an observation, and lines represent regressions.

DISCUSSION

Results indicate that the quantity of parent language input to 3-month-old infants has large downstream effects on the quantity of child vocalizations at 18 months. This exciting finding may implicate child vocalizations as a mediator of the relation between parental input and children's later vocabulary and cognitive development. Parents also showed striking stability in language input across a 15-month time frame. These findings highlight brief face-to-face interactions as fruitful contexts for assessing children's language exposure and vocal production.

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