Supplementary Materials for ‘Talking to talkers: Infants’ talk status, but not their gender, is related to language input’

Contents

Supplemental analysis of infants’ early productions

In the main text, we report analyses of infants’ noun productions over time (i.e., number of noun types and tokens produced each much). Here, we report a supplemental analysis of the number of *new* noun types the infants produced each month. We find the same pattern as the vocabulary models reported in the main text (“Early Productions”).

The regression results for the model including gender (model 2) indicate that infant gender was a significant predictor ($\beta_{gender-male}$ = -2.02, t(42.00)= -2.32, p = .025), and model 2 provides a significantly better fit to the data than baseline (model 1) by model comparison (χ^2=6.72, p = .010). Adding an interaction of age and gender (model 3) further improves model fit (χ^2=26.01, p < .001).

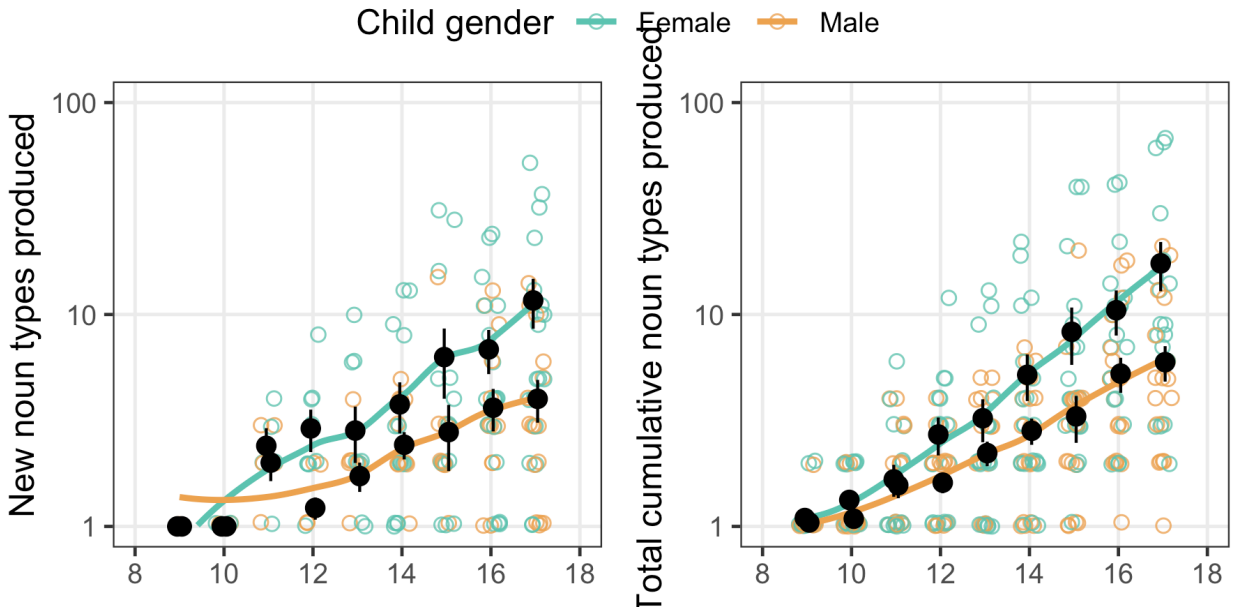

Figure S1. Noun types produced by child gender and age in months. Left panel shows the number of new noun types produced by the infants each month. Right panel shows total noun types produced each month (duplicated from Figure 3 in the main text) for visual comparison. Black points represent means with standard errors.

These results indicate that, as for total vocabulary, the increase in new noun types with age was stronger for girls than boys. See Figure S1.

Plot of input noun counts by age and gender

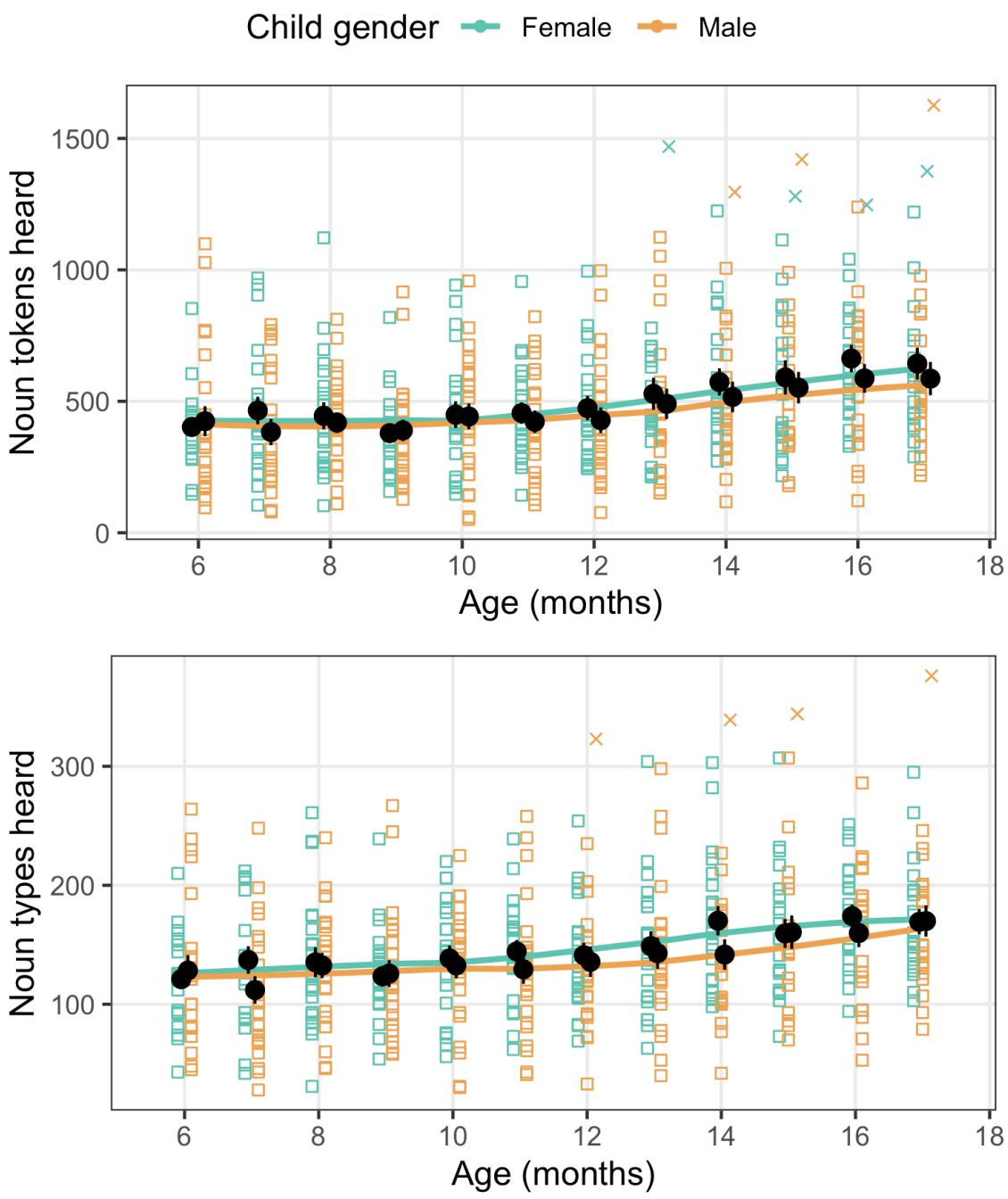

Figure S2. Noun input by child gender and age in months. Top panel shows noun tokens heard by the infants; bottom panel shows noun types. Black points represent means with standard errors. Outliers are represented by X-shaped points.

Analyses of parent-reported productive vocabulary (MCDI)

In the main text, we report analyses of children's noun productions as observed in our corpus of at-home recordings. We additionally collected MCDI vocabulary checklists monthly from 6 to 18 months, and here we report supplementary analyses of parent-reported productive vocabulary.

The age of first word, according to parent report on the MCDI, was about a month earlier for *male* infants than for *female* infants (M_{males}=11.33 (2.63) mos; $M_{females}$=12.20(2.12) mos), but this difference was not statistically significant ($t(37.96) = 1.16$, $p = .252$). See Figure S3. This is the opposite trend as we see in our researcher-observed data, where we found that female infants said their first word about a month earlier than male infants, on average (see "Early Productions" in the main text).

Contrary to our strong hypotheses, we did not find that children's productive MCDI vocabulary varied by gender ($t(41.76) = 1.43$, $p = .161$). In our sample, girls were reported to produce an average of 87.05 words by 18 months (SD = 93.60), compared to 51.65 words for boys (SD = 59.02). See Figure S1. This is contrary to the robust gender difference found in a large international database of CDI data, Wordbank (Frank et al., 2021). Across the Wordbank database, the median productive vocabulary at 18 months (on Words & Gestures) is 68 for girls and 40 for boys (Frank et al., 2017). This is directly in line with the vocabularies of children in our sample, where we find a median vocabulary of 68 for girls and 31 for boys.

Here again, our analysis is underpowered due to our sample size (N = 44). A post hoc power analysis revealed that based on our observed effect size (r = 0.25 as calculated from our Wilcoxon test), an N of 130 would be needed to obtain statistical power of 0.80. Therefore, we

believe that the gender difference we find in MCDI productive vocabulary in our sample is in line with the literature, despite our lack of statistical significance.

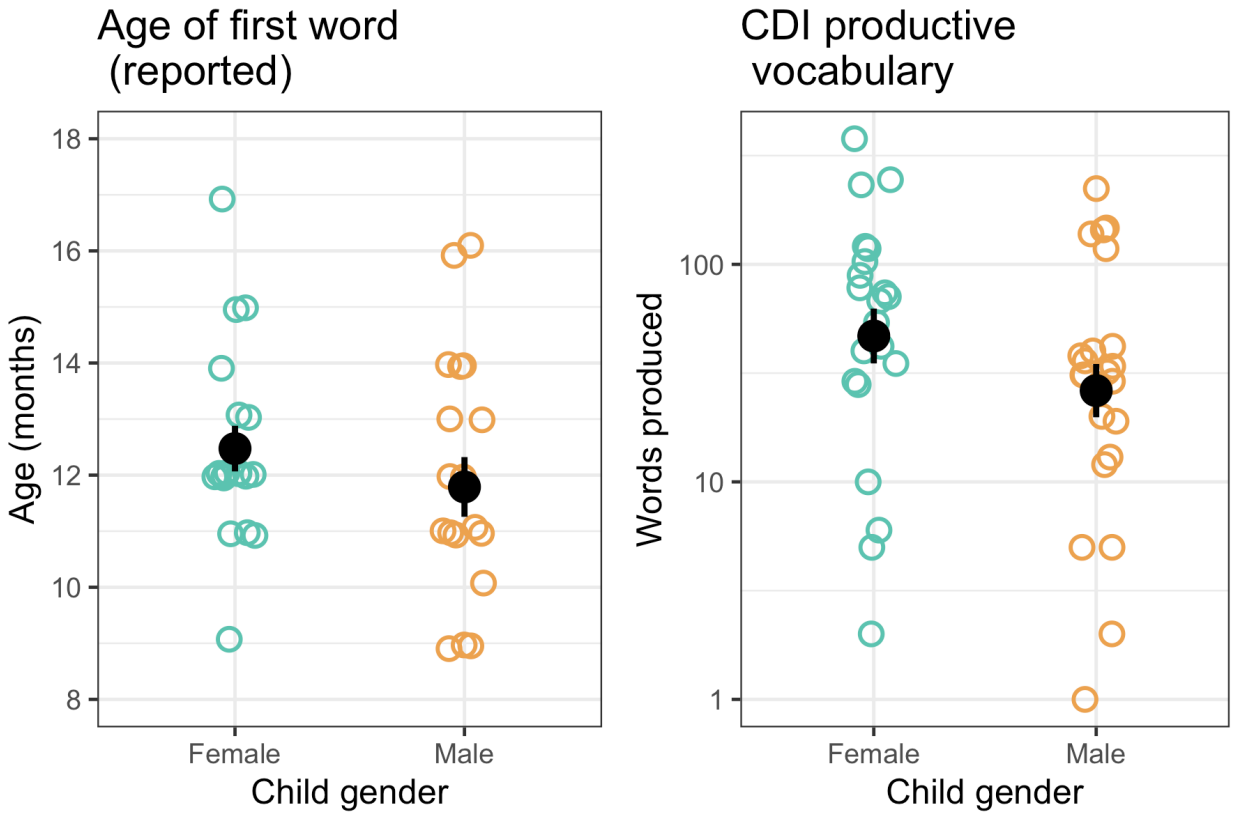

Figure S3. Left panel shows the age of first word, as reported by parents on the MCDI, by child gender, and right panel shows the MCDI productive vocabulary by gender (y-axis log-transformed). Black points show means with standard errors.

Analyses of LENA automated speech estimates

In the main text, we report analyses of children's noun input and productions, as proxies for their overall language input and productions. Here, we report supplemental analyses of automated speech estimates calculated by the Language ENvironment Analysis system (LENA Research Foundation, Boulder, CO).

We collected monthly daylong audio recordings for each participant from 6–17 months. In addition to the hand annotations described in the main text, we used LENA's proprietary algorithm to generate estimates of adult words (AWC), conversational turns (CTC), and child vocalizations (CVC). From these estimates, we calculated metrics per hour to account for differences in recording length, then computed the average for each participant. Then, we use t-tests to assess if adult words, conversational turns, or child vocalizations vary by gender.

We include LENA's key measures (AWC, CTC, and CVC) but not talker category metrics. This is because while the holistic measures, particularly AWC and CVC, are relatively robust proxies for speech to and by young children (Cristia, et al., 2020), the talker-tags do not have particularly strong accuracy at the talker category level (e.g., Female Adult Near (FAN) and Male Adult Near (MAN); c.f. recall and precision for speech tagged by human annotators vs. LENA for the child, female adult and male adult categories in Cristia et al, 2021). We also note that these LENA metrics, while provided for completeness, capture all speech or speech-like vocalizations, rather than the lexical level we focus on in the main manuscript.

We found no gender differences in adult words (M_{girls} = 1,267.58 (390.10) words per hour; M_{boys} = 1,249.08 (464.28) words per hour; $t(41.73) = 0.14$, $p = .887$), conversational turns (M_{girls} = 32.65 (14.15) turns per hour; M_{boys} = 31.63 (9.44) turns per hour; $t(34.65) =$

0.28, $p = .784$), or child vocalizations (M_{girls} = 110.48 (35.22) vocalizations per hour; M_{boys} = 119.35 (33.52) vocalizations per hour; $t(41.17) = -0.85$, $p = .398$). See Figure S4.

These results are in line with our main analyses, finding no gender differences in language input (just as we saw with nouns) nor in the number of children's early vocalizations (just as we saw with noun tokens, rather than types).

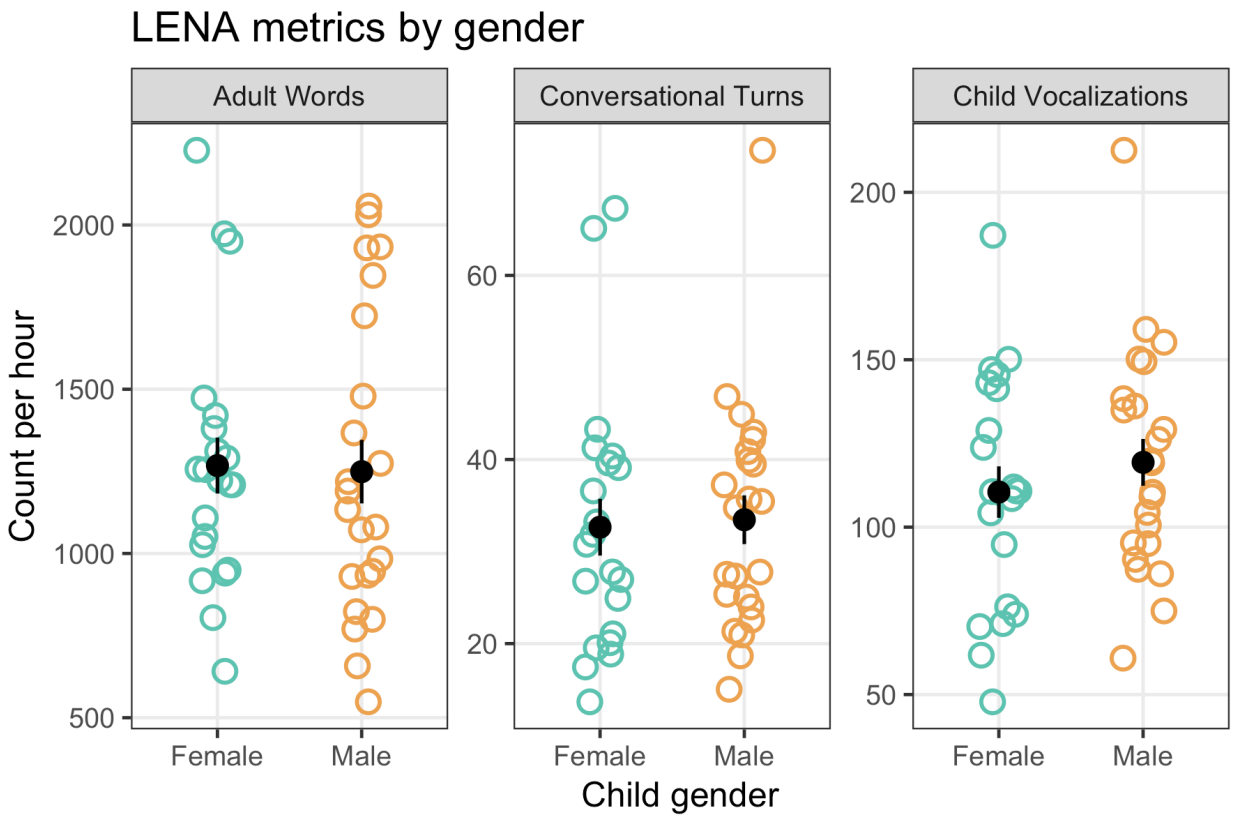

Figure S4. LENA-generated automated speech estimates by gender. The left panel shows adult words (AWC), middle shows conversational turns (CTC), and right shows child vocalizations (CVC). Each point shows the average count per hour across one infant's recordings. Black points show means with standard errors.