Why Do Female Infants Say More Words?  
An Input/Output Analysis of Talking Status & Gender  
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**BACKGROUND**

- Language differences in infancy persist (Elliott, et al., 1989)
- Girls learn language faster than boys (Kimura, 1999; Fenson et al., 1994)
- Language delays/deficits disproportionately affect boys (Shriberg et al., 1999)
- Gender-based language differences are generally examined pre- or post-talk onset, not both (e.g. Huttenlocher et al, 1991, Johnson et al, 2014).
- Here we combine input and production data longitudinally.

**METHOD**

- Analysis from 44 infants (21 female), 6-17 months (SEEDLingS corpus)
- Monthly daylong audio and hourlong video recordings at home for each infant
  - 68 hours of recordings analyzed per infant
- Annotates child-directed and child-uttered object words
  - Only concrete nouns (e.g. foot, ball)
- Analyzed input/output types & tokens: Wilcoxon tests over raw values, multi-level/linear regressions over log values.

**RESULTS**

**Research Questions:**

1) Do male and female infants produce different quantities of words?
2) Does infants’ input vary by gender and whether they’ve begun talking?

- No gender differences in input:
  - Not shown here: no gender differences in utterance types (question, imperative, short-phrase, etc.).

**Word types produced (per hourlong video):**

- Older infants and female infants produced more nouns.
- Female infants do not hear more noun types or tokens in their input.
- Regardless of gender, infants get an input boost once they start talking.

- Type counts: two main effects ($\beta_{\text{age}} = .48, \beta_{\text{gender}} = -.66; p<.005$)
- Token counts: month x gender interaction ($\beta = -.26, p<.05$)

**Word tokens produced:**

- Female infants were not more talkative overall (noun tokens), but did say more unique nouns (types).

**Language production: Nouns infants said**

- No difference in age of noun onset ($M_{\text{girls}} = 12.10$ mos, $M_{\text{boys}} = 12.78$ mos; $p=0.37$)
- Gender and age accounted for >90% of the variance in productive vocabulary.
  - Type counts: two main effects ($\beta_{\text{age}} = .48, \beta_{\text{gender}} = -.66; p<.005$)
  - Token counts: month x gender interaction ($\beta = -.26, p<.05$)

**Language input: Nouns infants heard**

- Significant effect of talk status, but not gender, on number of nouns infants heard
  - Input counts from hourlong videos
  - Significant effect of talk status on both types and tokens overall ($p<.001$).
  - No gender differences in input:
    - Types or tokens pre-talk, post-talk, or overall; no interactions (all $p> .05$).
  - Not shown here: no gender differences in utterance types (question, imperative, short-phrase, etc.).

**DISCUSSION & CONCLUSIONS**

**Language production: Nouns infants said**

Not surprising: Female infants have larger productive noun vocabularies than males.

**Language input: Nouns infants heard**

Noun input did not vary by infant gender; it varied by infants’ talk status.
- Female infants do not hear more noun types or tokens in their input.
- Regardless of gender, infants get an input boost once they start talking.

Our results replicate and support the finding that girls have a production advantage, independent of language exposure.