

## Background

- Quantity of linguistic input, especially within conversational interactions, has been shown to contribute to children's linguistic achievement (Huttenlocher et al., 1991; Hoff & Naigles, 2002).
- Many early intervention programs encourage parents of children who are hard of hearing (HH) to increase their linguistic input to children as a way to facilitate children's language development.
  - We do not know if this results in parents who talk more to their children who are HH than to children with normal hearing (NH).
- There is a traditional belief that children who are HH vocalize less and are less engaged in conversational interactions than children with NH, although evidence has not supported this belief (Nathani, 2008; Moeller et al., 2007). Larger scale sampling from direct empirical studies is needed to examine this issue.

## Research Questions

- 1) Are children who are HH exposed to more or fewer words than children with NH?
- 2) Do children who are HH participate in fewer turn-taking interactions or vocalize less frequently than their NH peers?
- 3) Do adult word count, child vocalization count, or number of conversational turns account for variance in the receptive and expressive language abilities of children who are HH?

## Methods

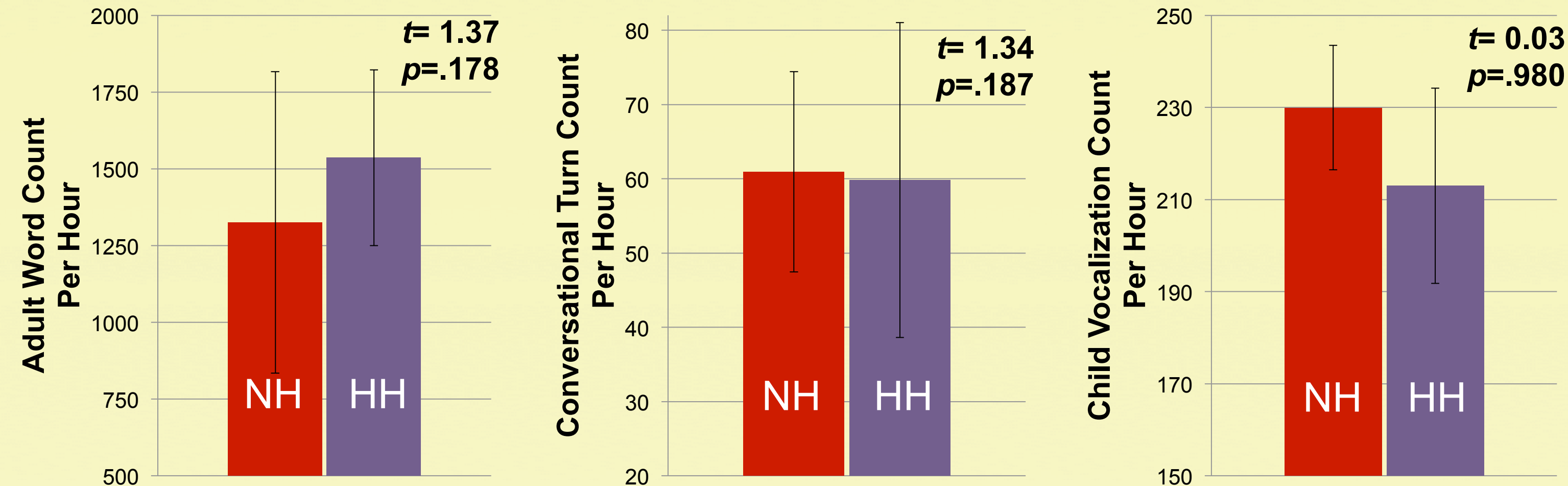
### Procedures:

- LENA recordings were collected at consecutive 1-month intervals. Key variables were calculated per hour for each recording and averaged across recordings for each child to control for day to day variability.
- Receptive and expressive language scores were collected via the Mullen Scales of Early Learning (MSEL) near children's 1<sup>st</sup> or 2<sup>nd</sup> birthdays as part of the Outcomes of Children with Hearing Loss study.

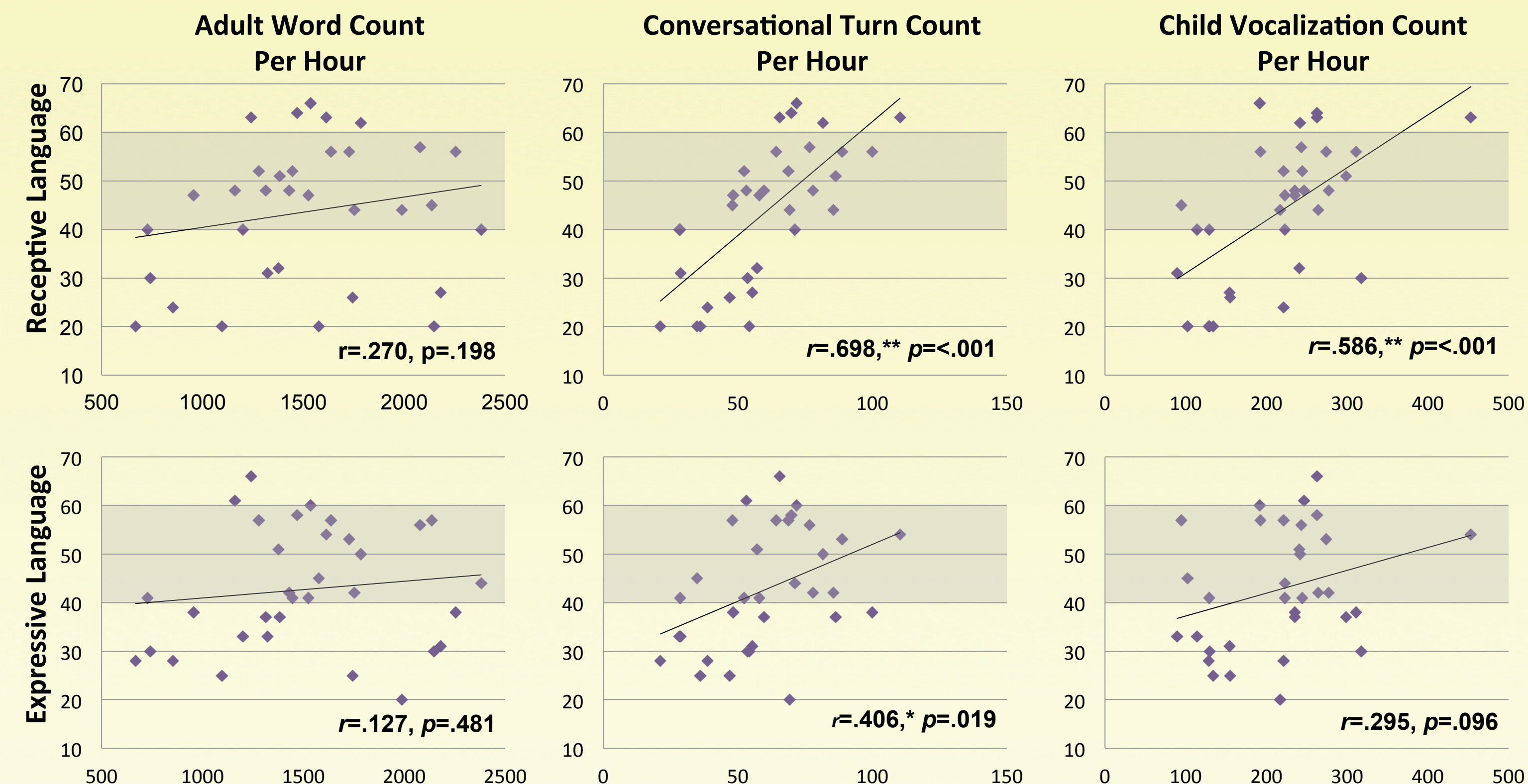
### Subjects:

- NH group: 11 children with normal hearing
  - Age at 1<sup>st</sup> recording:  $M=27.4$  mo,  $SD=6.3$
  - Age at MSEL administration:  $M=25.6$  mo,  $SD=5.1$
- HH group: 33 children with mild to severe hearing loss (BEPTA:  $M=50.4$  db HL,  $SD=12.4$ )
  - Age at 1<sup>st</sup> recording:  $M=23.6$  mo,  $SD=4.8$
  - Age at MSEL administration:  $M=23.1$  mo,  $SD=4.8$

## Results: Between Groups



## Results: HH Group



The shaded areas indicate 1SD above and below the normative mean on the language measures. The HH group's mean T-score was 43.6 for receptive language and 42.7 for expressive language. These scores were significantly below the normative mean of 50 ( $p=.001$  and  $p=.016$ , respectively).

## Results: HH Group

- Conversational turns account for significant variance in receptive language outcomes after controlling for child vocalizations ( $\Delta R^2=.146$ ,  $p=.006$ ).
- However, child vocalizations do not contribute any unique variance beyond that accounted for by conversational turns ( $\Delta R^2=.001$ ,  $p=.776$ ).

## Conclusions

- Children who are HH and NH are exposed to about the same amount of talk from their caregivers/parents, and input isn't strongly related to outcomes.
- Despite weaker receptive and expressive language skills, children who are HH do not participate in less conversational turns or vocalize less than their NH peers.
- For the HH group, an increased number of child vocalizations and participation in conversational turns was correlated with stronger language abilities.
- The relationship between conversational turns and language outcomes is not simply a matter of children with stronger language skills being more vocal and thus more likely to engage in conversations.

## Future Directions

- Examine whether adult females, adult males, or other children engage differently with children who are HH vs. NH and if those interactions contribute differently to children's language outcomes.
- Examine how LENA variables, and the relationships between LENA variables and outcome measures, change over time for children who are HH and NH.

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