

Comparing Speech Characteristics in the Everyday Language Environments of Deaf Children with CIs and Hearing Children

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Big Question: How does speech input to Deaf and Hard of Hearing children with CIs compare to that of hearing children?

Background

- Speech input is tied to linguistic outcomes for typically hearing children^{[1][2][3]}
- Cochlear implants (CIs) provide sound perception to some Deaf and Hard of Hearing (DHH) individuals, but these are implanted at ≥9mos of age
- Past work finds little difference in input language characteristics,^{[4][5]} but few use hand-annotation, as wide a breadth of metrics, or Hearing Age (HA) matches to control for duration of language exposure



Methods

N=48 infants, age M=16.2 mos., 1x daylong (M=14.37 hours) LENA naturalistic recording each

n	Group	Age Range	Age Mean
16	DHH	14-32	20.7
16	Chronological Age (CA) Match	14-32	21.1
16	Hearing Age (HA) Match	6-9	6.9



Results

word prop:

Sensory modality

Quantity of speech does not seem to differ significantly by hearing status.

Semantic Measures



DHH children hear more words about listening and hearing,^[6] but proportions of utterances talking about the "here and now" are similar.



Children who hear more adult-directed speech (younger children) hear longer utterances as a result. Lexical diversity is similar across groups.

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CDS-only

Examining Child-Directed Speech



Interaction Measures

Count

Turn

onversatior

Older children hear more conversational turns

and CDS. Interaction mostly varies by age, not

hearing status or listening experience.

The features of child-directed speech do not differ significantly as a factor of child hearing status.



= machine-annotation metric (full recording analyzed)

= significant result (p < 0.025)

Discussion

- DHH children hear more highly auditory words (possibly due to language interventions)
- HA matches have lower CTCs and hear longer utterances; may be age-dependent
- Caregivers modify their speech more as a function of age than hearing status, and input to DHH children is similar to that of age-matched hearing children

Future Work

- Why does broadly similar language input yield diverging outcomes between hearing and DHH children?^{[1][2][3]}
- May be due to CI providing incomplete access to language input

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A LENA recorder used in the study

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