Characterizing North American child-directed speech by age, gender, and SES

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CDS is...
- Linguistically distinct from ADS [1,2]
- Preferred over ADS by infants [3–5]
- Related to faster lexical processing and larger vocabularies in the first few years of life [6,7]
- Variable given a range of demographic factors [8,9]

Current literature
- Difficult to compare across diverse studies/methods
- Short (semi-)structured sampling
  - Overestimates CDS [10]
  - Neglects non-maternal speech [11]

Daylong recordings
- Increase ecological validity
- Focus on *all* speech instead of CDS
  - Lack of automated tools

Our approach: Combined North American sample with multiple demographic variables
- Child and caregiver age
- Child and caregiver gender
- Maternal age and education

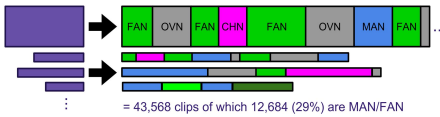
Methods

- Daylong audio from four N.A. corpora [12–16]
- 61 typically developing, Eng-speakers (29F)
- Age sampled as uniformly as possible 0–20 months

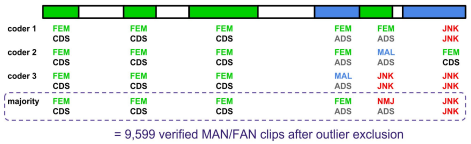
Sampled & annotated across labs with custom software [17]

Randomly select 20 LENA conversational blocks, requiring each to have 10+ utterances, at least two of which are classified as nearby adult speech (MAN or FAN).

Split each block into its component LENA speaker-tagged audio clips.



Three coders annotate each MAN/FAN clip for gender (male/female/junk) and addressee (child-directed/adult-directed/junk). We analyze the majority code from these annotations.



Data Analysis

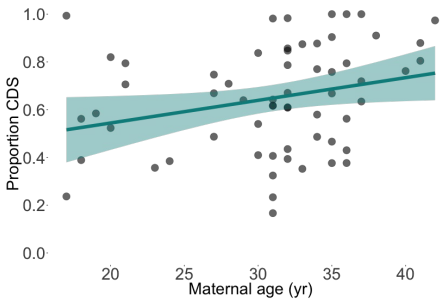
Three measures
- CDS quantity (minutes per hour)
- ADS quantity (minutes per hour)
- Proportion CDS ($\frac{CDS}{CDS+ADS}$)

Mixed-effects linear regressions with
(a) all speakers pooled together for each child
(b) male and female speakers separated for each child

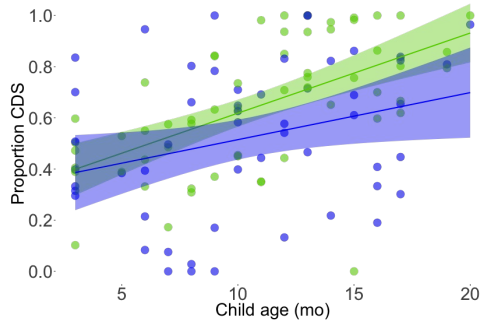
Exploratory; only include predictors that improve fit.
Child age (0–20 mo; M=10.8) and gender (M/F), maternal age (17–42 yr; M=30.9) and education (no-BA/BA/AD), and number of older siblings (0–4; M=0.79)

CDS proportion: M=.65(.22)

Pooled speakers:
Child age: each month +2.7% CDS (*SE*=.005, *t*=5.5)
Maternal age: each year +.9% CDS (*SE*=.004, *t*=2.5)

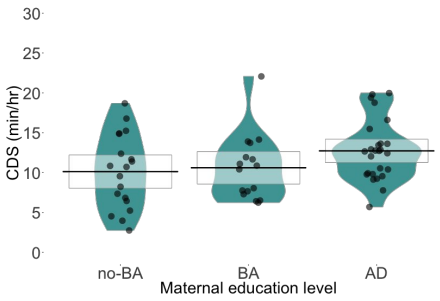


By speaker gender:
Speaker gender: women +10% CDS vs. men (*β*=-.1, *SE*=.04, *t*=-2.5)
Child age: each month +2.5% CDS (*SE*=.005, *t*=4.9)

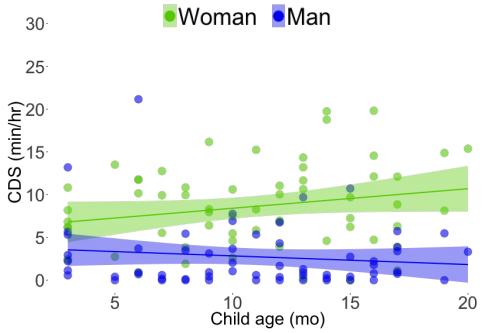


CDS Quantity: M=11.36(4.24) min/hr

Pooled speakers:
Maternal education: each level +1.3 min/hr CDS (*SE*=.6, *t*=2.2)

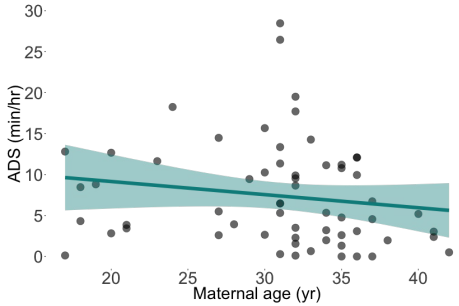


By speaker gender:
Speaker gender: women x3 CDS vs. men (*β*=-5.4, *SE*=.8, *t*=-6.6)

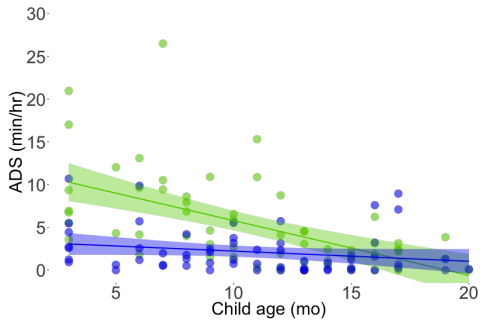


ADS Quantity: M=7.34(6.4) min/hr

Pooled speakers:
Child age: each month -.74 min/hr ADS (*SE*=.2, *t*=-4.7)
Maternal age: each year -.27 min/hr ADS (*SE*=.1, *t*=-1.9)



By speaker gender:
Speaker gender: women x2 ADS vs. men (*β*=-2.8, *SE*=.7, *t*= 4.1)
Child age: each month -.64 min/hr of ADS (*SE*=.1, *t*=-6.3)
Child age * speaker gender: age effect is smaller for male speakers (*β*=-.5, *SE*=.1, *t*=-3.7)



Conclusions

- **Children hear more speech from women,** now we quantify it! Speaker gender effects outpace all others >> implications for models of linguistic input
- **ADS decreases with age**. CDS estimates are similar to others' but ADS decrease is novel >> children's increasing independence on speech input?
- **SES effects are comparatively small** in these data but are otherwise in-line with previous work. We find no evidence of child gender effects

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(see handout for references)

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