Child language experience in a Tseltal Mayan village

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Abstract

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Keywords: keywords

Word count: X

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Introduction

How much linguistic experience do children need in order to learn their native language(s)? This question has been asked many times before, often interpreted as a challenge to establish what types of evidence (and how much evidence) is necessary to support first language acquisition. Developmental language scholars have brought a variety of methods and perspectives to bear in addressing this question. Although early claims about children's language environments characterized linguistic 'input' as complex and error-prone, with no negative evidence (REFS), decades of work has overturned this view entirely: the speech that children hear and use in their interactions with others is rich with multimodal information that children can leverage to infer linguistic knowledge. An equally important branch of this work has emphasized that, in fact, children's own speech productions closely mirror the stochastic patterns of their input (REFS). This usage-based view of language development has also been able to convincingly account for the kinds of errors children do and don't make in spontaneous speech (REFS), arguing that their early representations are closely tied to the speech patterns the surrounding language environment (see also REFS).

- Children require linguistic input to become full-fledged speakers of their language(s)
- As developmentalists, our ultimate goal is to be able to model the diverse mechanisms that allow children to convert the linguistic information in their environment to internalized linguistic knowledge, e.g., (statistical learning, motor development, etc.; see slides)
- We have (rightfully) spent an enormous amount of time analyzing what information exists in children's input—such information is an important jumping off point for inspiring and constraining theories about learning mechanisms
- We have developed many techniques for tracking input, most recently daylong recordings

- Extoll the virtues of daylong recordings
- Indeed, studies along these lines, linking children's language experience to their language outcomes, finds a strong impact of experience, especiall with respect to CDS
  - List some findings on input effects
  - Why is CDS special? Briefly list findings
- However, there are two major caveats to this work, all interrelated with each other:
- 1: While evidence linking input and vocab is super strong, evidence linking input to grammar is more scant; aspects of the system may be differentially sensitive to experience (Dan's paper)
- 2: Literacy-centric view of language development; what is the "target"?
- 3: Focused on WEIRD kids
- A key avenue for addressing these issues is to promote further study of lg development in non-WEIRD contexts.
- Linguistic anthropologists have been doing this for a long time
- Now it's time for us to follow-up using our own methods so that we can more feasibly compare
  - Though that comes with its own problems (cite...)
- Especially in less-literate/semi-literate communities, it lets us more easily think about language acquisition apart from literacy
- In this paper we examine the linguistic experiences of 10 Tseltal Mayan children. Why Mayan?
- Non-WEIRD
- Rich area of research: Little CDS from report—potentially a great case for looking at a functioning acquisition system with minimal environmental input
- Many linguistically and culturally similar communities for comparison (see Shneidman, Pye, etc.)

- See slides for more
- A major contribution of this work is to use daylong recordings, which allow us to estimate... (TLM paper on short vs. longer recs).
  - At the same time, there is potentially great value in knowing about what happens during interactional bursts when they happen, so we track ... tt and va as well
- Our aim is to develop a child language environment profile for Tseltal Mayan, one that gives an impression of the speech children hear around them and the type of speech that is addressed to them directly.
- Results:
- How much speech do children hear overall and what proportion of that is directed to them? How does that compare to other communities we've studied?
  - *measures*: XDS and TDS minutes per hour and proportion (from random selections only)
- How do ADS and TDS differ?
  - *measures*: utt length, repetitiveness, F0 peaks and ranges, questions, imperatives (?)
- How much speech do children hear during bouts/bursts of interaction? How often do these bursts occur?
  - *measures*: deltas for m/h TDS, #utts TDS, # TT transitions between random, tt, and va: are they actually different?
  - *measures*: XDS and TDS minutes per hour and proportion (from tt and va selections: do they show similar age effects?)
  - *measures*: sliding window in random to match mean TDS rate/TT transition rates
- Does interaction influence linguistic practice?
  - *measures*: m/h CHI vocs, # CHI vocs, & voc mat between random, tt, and va

- Discussion
- Summary of findings
- When thinking about quantity: Do we care about the avg over the day or do bursts matter more?
  - Benefits of naps between bursts? Natural input cycle? How many "good" minutes are enough to spur learning on?
- How should we think about CDS? What is universal about its format?
- So what is the impact of input in this community? What do we predict?
  - One point often raised: do these kids show a delay? Problematize this.
  - More interesting: language experience itself shapes use of mechanisms for learning, e.g., learning fro overhearing (Shneidman)
- Big issue we have to face as work continues in this vein: what are these kids learning? We can't continue to pretend that we are capable of defining and encapsulating a phenomenon as emergent as language.
- Limitations
  - no video data
  - only 10 kids

Methods

How to define temporal contingency for turn taking

Many other studies of child-caregiver turn taking use an arbitrary cut-off for detecting contingency (5 seconds?? Look up references). We base ours on measures of turn taking in interactions with infants and young children. Hilbrink et al. (2015) looked at interaction in a longitudinal corpus from 3 to 18 months and found that infants' responses to mothers began between -700ms and 1200ms relative to the end of the mothers' turns. Complementarily, mothers' responses to infant vocalizations began between -350ms and 650ms relative to the

end of the infants' turns. Casillas et al. (2016) investigated the timing of question-answer responses from caregiver to child and from child to caregiver with children between 20 and 35 months. In their study, children's responses typically started between -500ms and 650ms relative to the end of their caregivers' turns. Caregivers' responses typically started between -1000ms and 400ms relative to the end of their children's turns. Because both studies focused on fairly intensive bouts of interaction, and both within WEIRD parental contexts, we defined contingent responses in the current data with slightly generous allowances for overlap and gap: contingent responses must begin with no more than 1000ms of overlap and 2000ms of gap relative to the offset of the first speaker's turn. We used this same criteria for finding child-to-other turn transitions and other-to-child turn transitions. Transitions were only counted if the other speaker's turn was coded as addressed to "T" (the target child).

Participants

Material

Procedure

Data analysis

Results

Still to graph

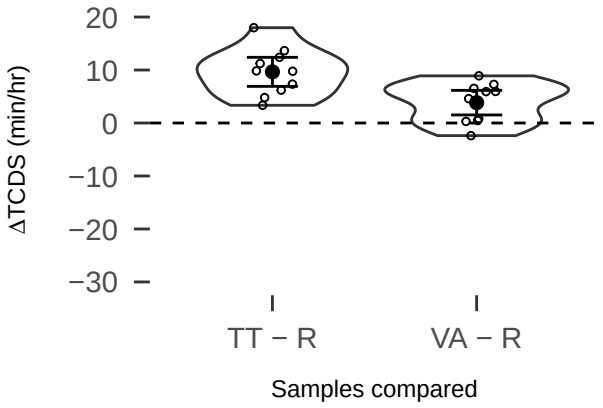
3: sliding window in random to match mean TDS rate/TT transition rates 4: utt length, repetitiveness, F0 peaks and ranges

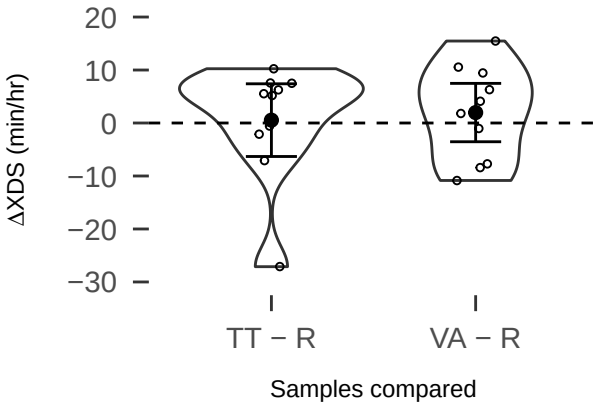
SHOULD I ADD DATAPOINTS ON THE UPH FIGS TO SHOW SHNEIDMAN'S DATA?

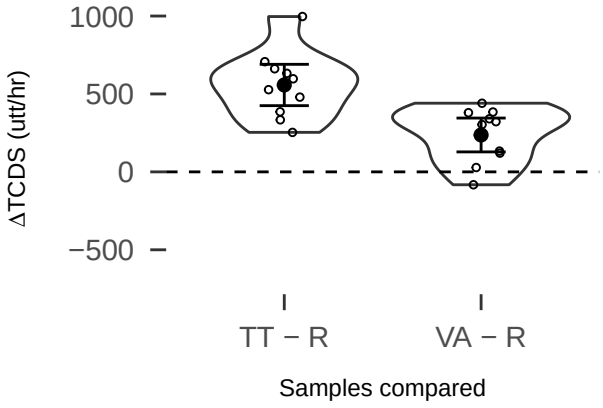
Age 1: - US: CDS 616 (SD=231); ADS/OCDS 278 (SD=247) – 79% XDS from MOT (~60% XDS MOT is CDS); 8% XDS from children (mostly ADS/OCDS) - Mayan: CDS 86 (SD=59); ADS/OCDS 342 (SD=201) – 31% XDS from MOT (~4% XDS MOT is CDS); 60%

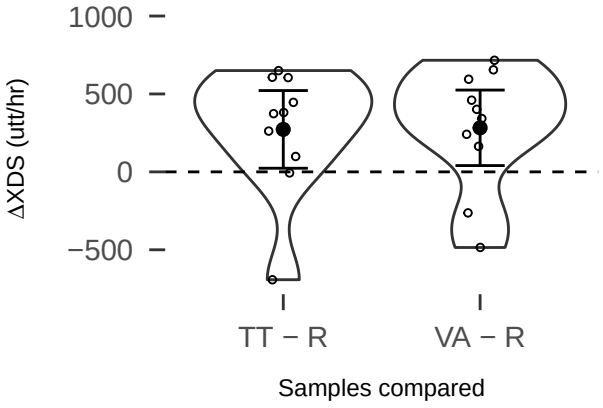
XDS from children (~50% XDS other kids was ADS/OCDS) Age18mo?: Age 2: - US: CDS M=815, SD=376; ADS/OCDS M=411, SD=318 – M=65%, SD=28% from MOT (directed: M=800, SD=381; overheard: M=211, SD =55); – M=7%, SD=10% from kids (directed: M=15, SD=22; overheard: M=86, SD=141) - Mayan: CDS M=274, SD=166; ADS/OCDS M=271, SD=136 – M=19%, SD=17% from MOT (directed:M=104, SD=100; overheard:M=82 SD=52); – M=61%, SD=27% from kids (directed:M=104, SD=100; overheard:M=82 SD=52) Age35mo?

Observation only data. 13 months Directed speech 140 (55); Overheard speech 377 (176) 18 months Directed speech 211 (70); Overheard speech 240 (96) 24 months Directed speech 315 (69); Overheard speech 360 (73) (I think these data weren't coded for adult vs. child speaker)

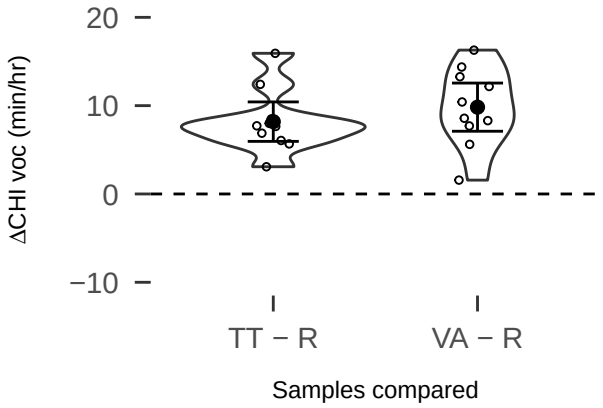

ΔTCDS (min/hr)
20
10
0
−10
−20
−30
TT − R
VA − R
Samples compared

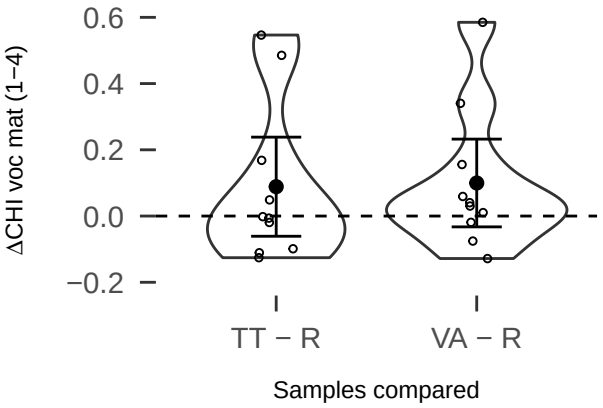

ΔXDS (min/hr)
20
10
0
−10
−20
−30
TT − R
VA − R
Samples compared

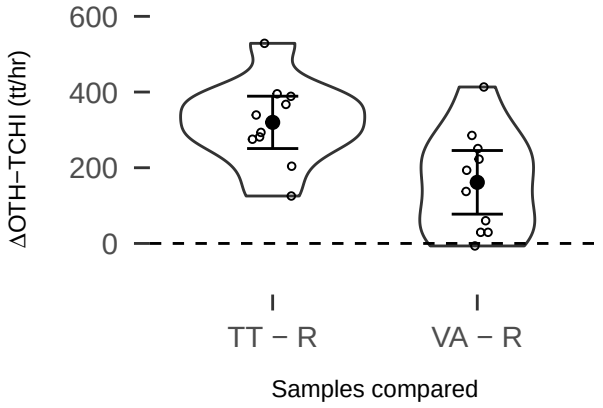

ΔTCDS (utt/hr)
1000
500
0
−500
TT − R
VA − R
Samples compared

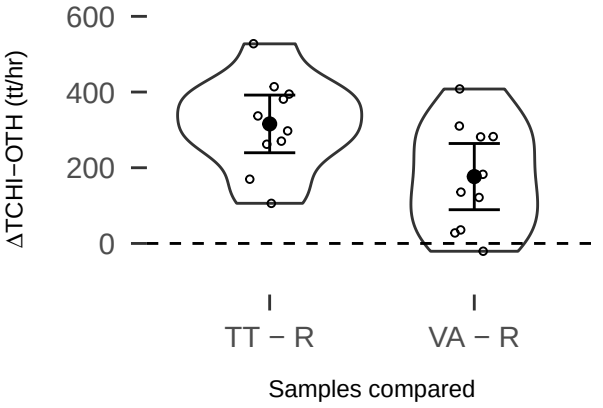

ΔXDS (utt/hr)
1000
500
0
−500
TT − R
VA − R
Samples compared

148


ΔCHI voc (min/hr)
20
10
0
−10
TT − R
VA − R
Samples compared


ΔCHI voc mat (1−4)
0.6
0.4
0.2
0.0
−0.2
TT − R
VA − R
Samples compared


ΔOTH−TCHI (tt/hr)
600
400
200
0
TT − R
VA − R
Samples compared


ΔTCHI−OTH (tt/hr)
600
400
200
0
TT − R
VA − R
Samples compared

149

150 ## Discussion

151 ## References

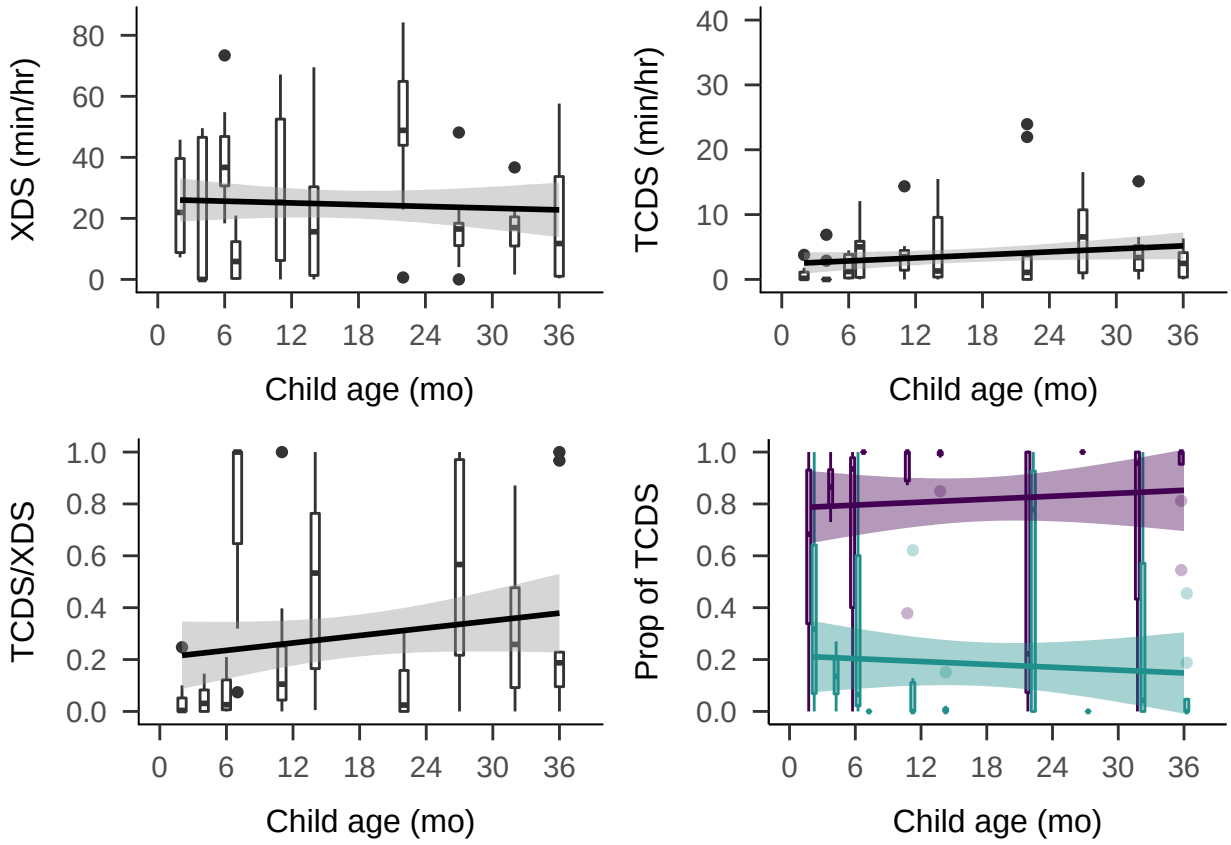

XDS (min/hr)
TCDS (min/hr)
TCDS/XDS
Prop of TCDS
Child age (mo)
0
6
12
18
24
30
36

Figure 1

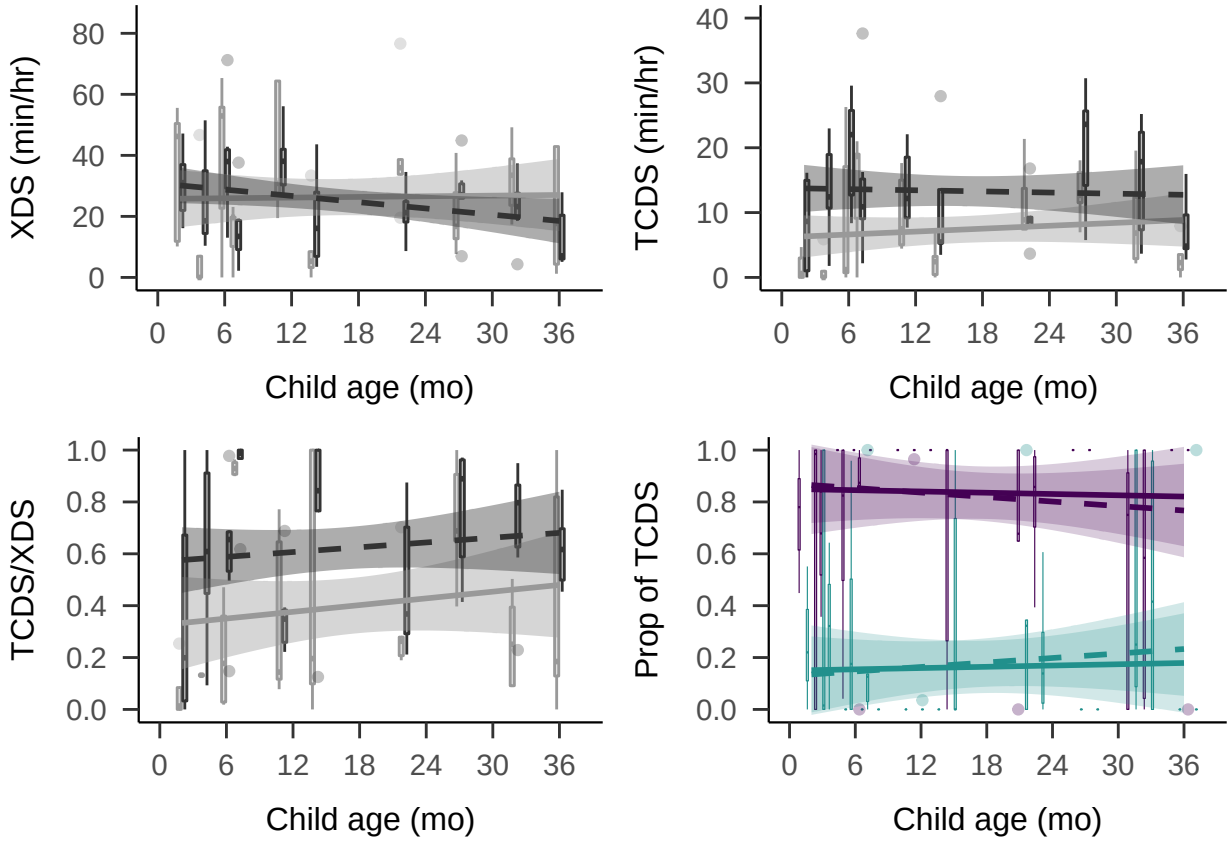

XDS (min/hr)
TCDS (min/hr)
TCDS/XDS
Prop of TCDS
Child age (mo)
0
6
12
18
24
30
36

Figure 2

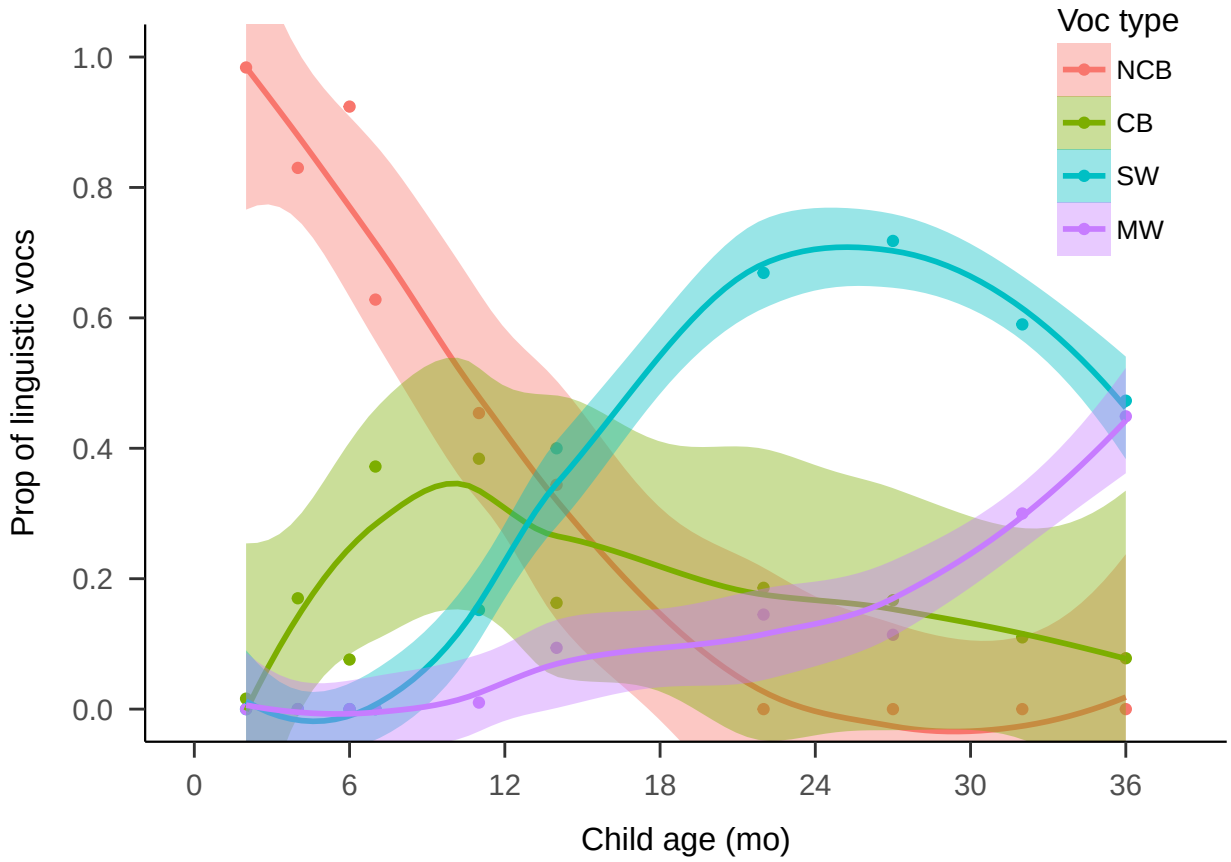

Voc type
NCB
CB
SW
MW
Prop of linguistic vocs
1.0
0.8
0.6
0.4
0.2
0.0
0
6
12
18
24
30
36
Child age (mo)

Figure 3