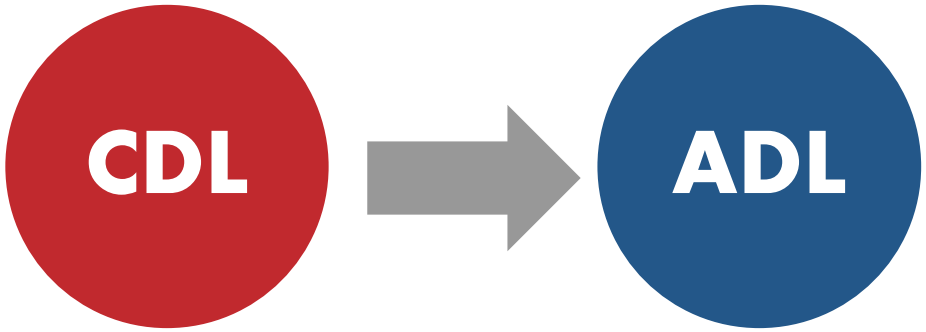
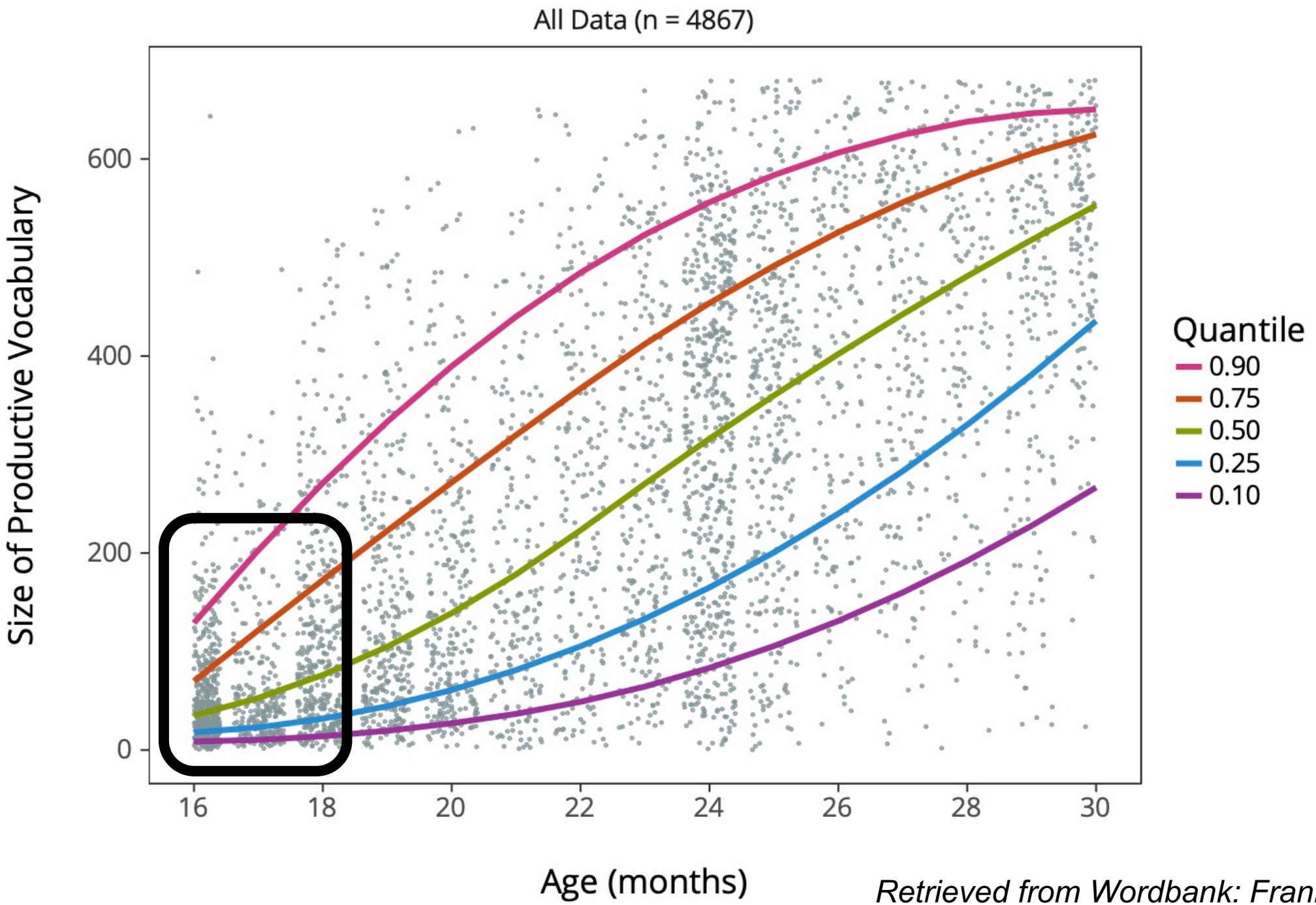
From *doggy* to *dog*: Developmental shifts in children's use of register-specific words

Kennedy Casey & Marisa Casillas

Comparative Human Development

University of Chicago





Retrieved from Wordbank: Frank et al., 2017

CDL-specific words in English

doggy

night-night tummy

Fenson et al., 1994; Frank et al., 2017, 2021

CDL-specific words in English

diminutive suffixes

blankie
doggy
duckie
piggy
choo-choo
tummy
vroom-vroom
owie
kitty
mommy
woof-woof
night-night
boo-boo
daddy
baa-baa
bunny

Ferguson, 1964; Kempe et al., 2005; Laing et al., 2016;
Ota & Skarabela, 2016, 2017; Ota et al., 2018; Skarabela et al., 2015

CDL-specific words in English

reduplication

blankie doggy duckie piggy choo-choo tummy vroom-vroom owie kitty mommy woof-woof night-night boo-boo daddy baa-baa bunny

Ferguson, 1964; Kempe et al., 2005; Laing et al., 2016;
Ota & Skarabela, 2016, 2017; Ota et al., 2018; Skarabela et al., 2015

CDL-specific words in English

onomatopoeia

blankie
doggy
duckie
piggy
choo-choo
tummy
vroom-vroom
owie
kitty
mommy
woof-woof
night-night
boo-boo
daddy
baa-baa
bunny

Ferguson, 1964; Kempe et al., 2005; Laing et al., 2016;
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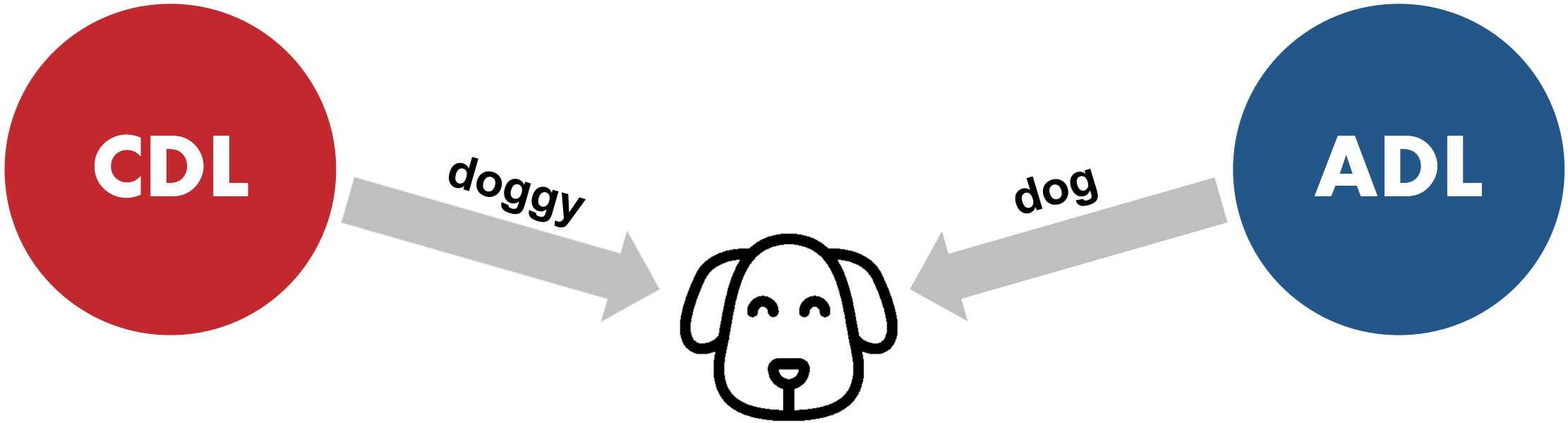
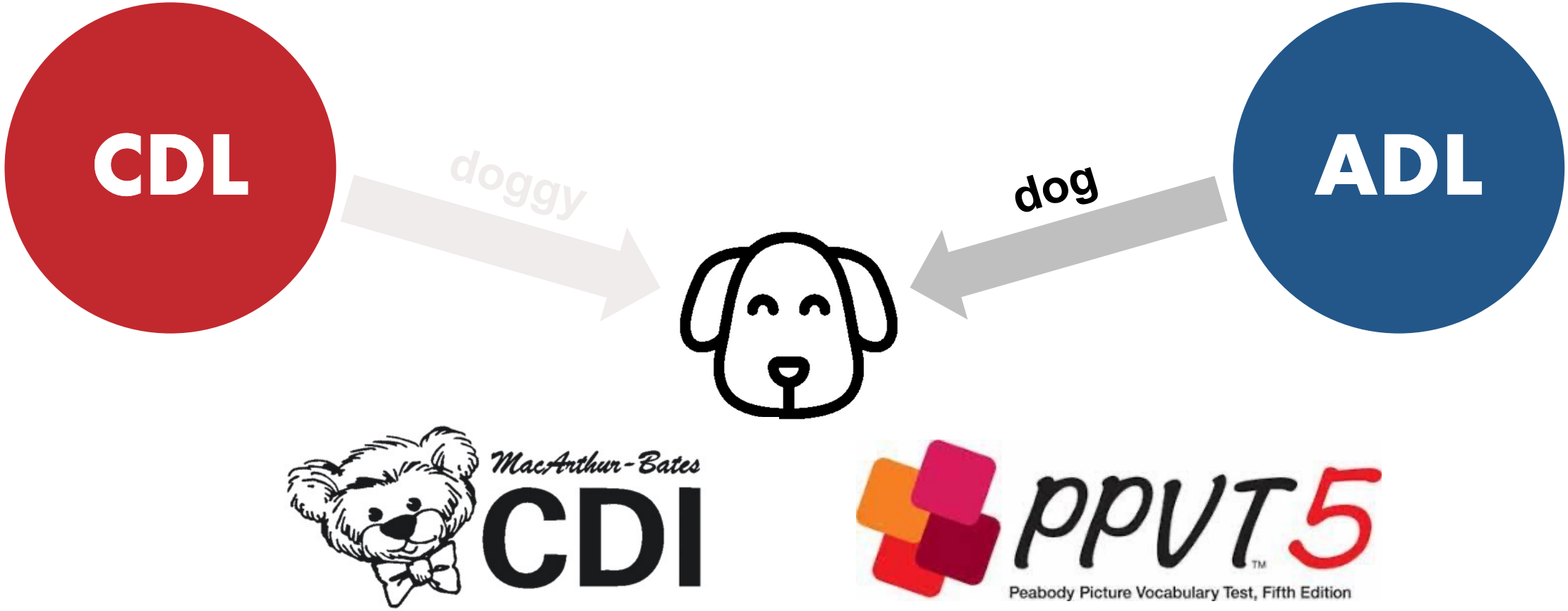
CDL-to-ADL vocabulary shift



CDL-to-ADL vocabulary shift



Dunn & Dunn, 1965; Fenson et al., 1994; Frank et al., 2017

Part 1: When?

60,000+ child-produced utterances

When do children make the shift from CDL to ADL vocabulary?

Part 2: How?

70,000+ other-produced utterances

What linguistic information in children's input supports their shift from CDL to ADL vocabulary?

15 CDL / ADL word pairs

birdie / bird

blankie / blanket

bunny / rabbit

daddy / dad

doggy / dog

dolly / doll

duckie / duck

froggy / frog

horsey / horse

kitty / cat

mommy / mom

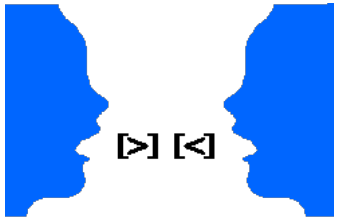
night-night / goodnight

piggy / pig

potty / bathroom

tummy / stomach

Corpus information – CHILDES & LDP



52 CHILDES corpora (North American English)

- 980 children
- 1 to 84 months (primarily cross-sectional)
- 8,251 transcripts

MacWhinney, 2000

Language Development Project (LDP) corpus

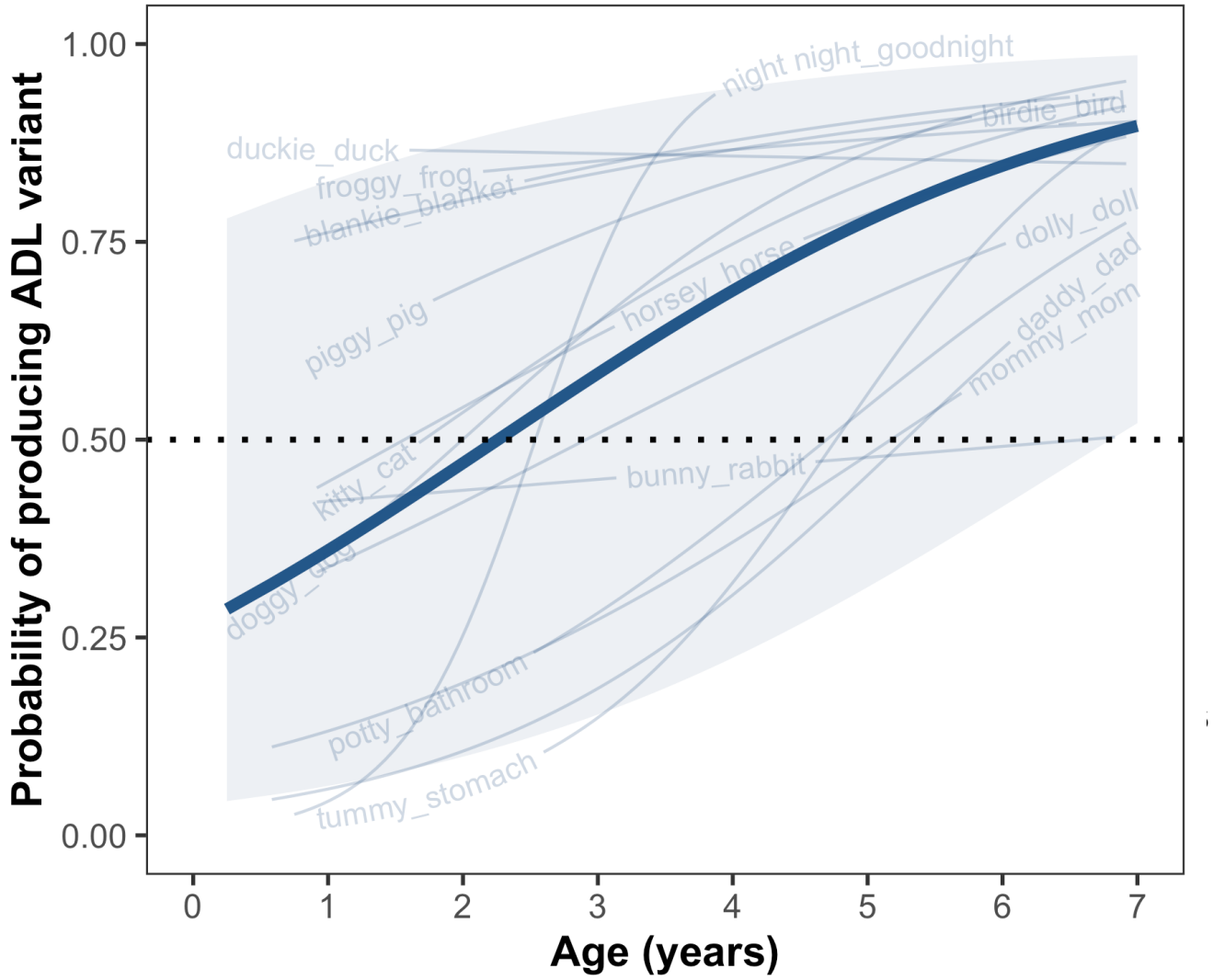
- 59 children
- 14 to 58 months (longitudinal)
- 622 transcripts

e.g., Huttenlocher et al., 2010; Rowe, 2008

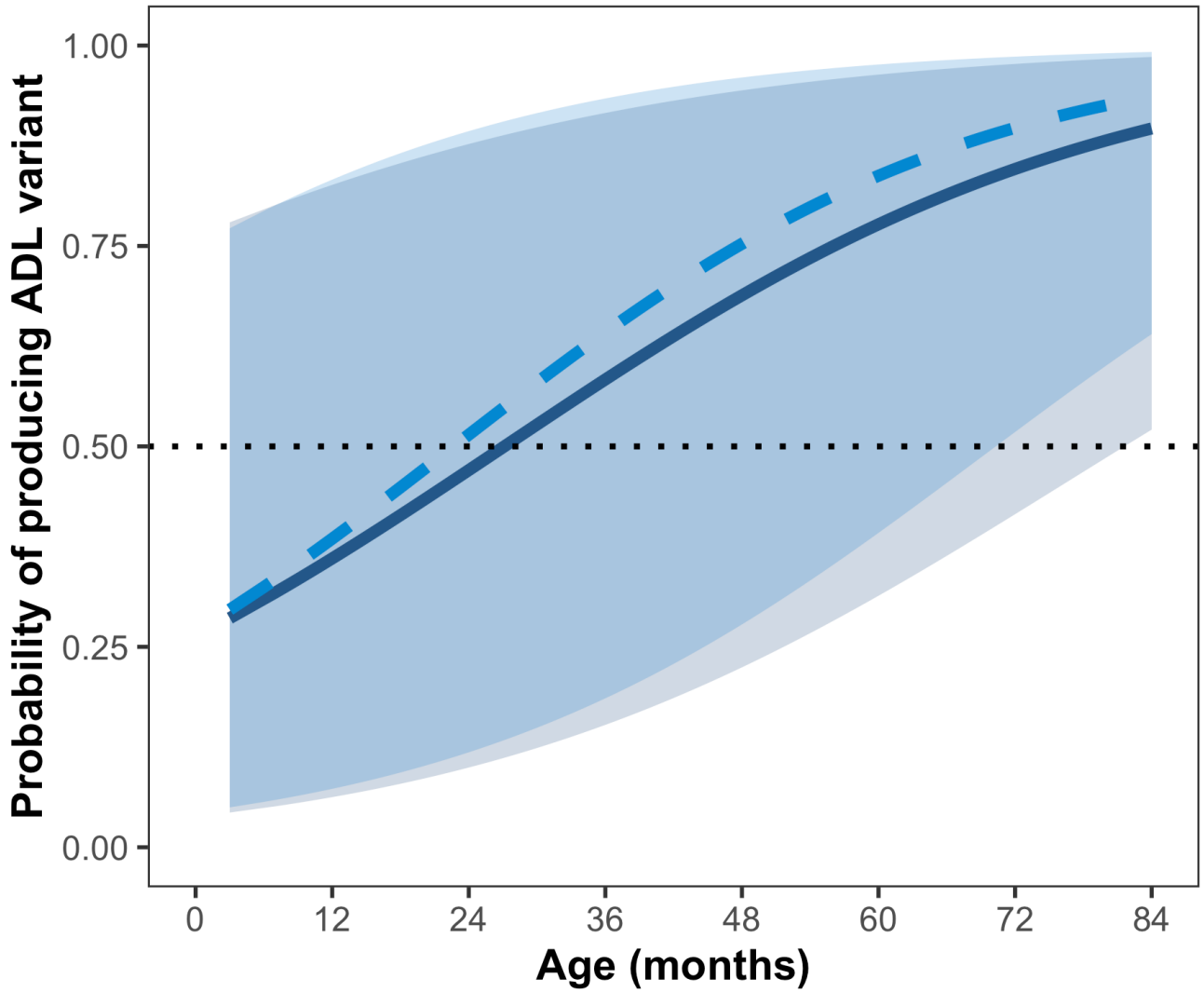
When do children shift from CDL to ADL vocabulary?

ADL

CDL



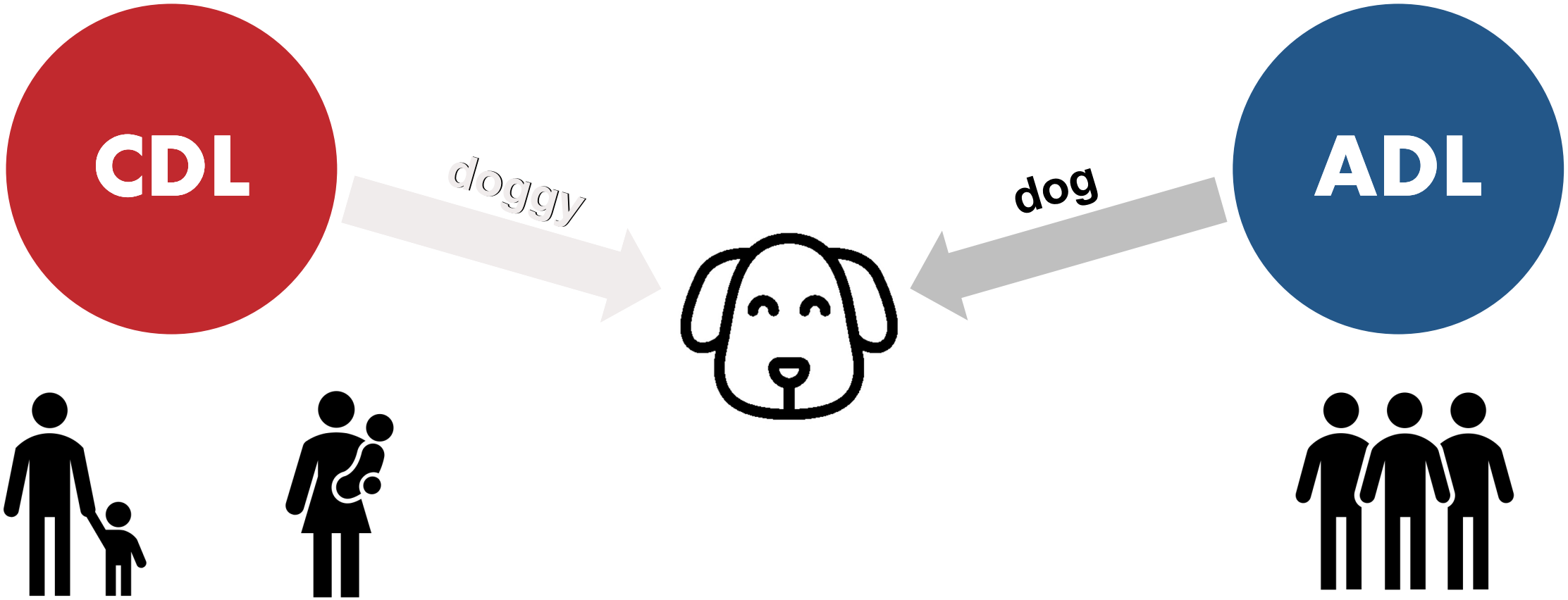
Part 1: Evidence for a CDL-to-ADL shift (average transition point at 2.5 years)



children

others

Associations between words and registers



e.g., Clark, 1997, 2018

Part 1: When?

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When do children make the shift from CDL to ADL vocabulary?

Part 2: How?

70,000+ other-produced utterances

What linguistic information in children's input supports their shift from CDL to ADL vocabulary?

Linguistic features

CDL REGISTER

vs.

ADL REGISTER

Higher pitch
Exaggerated prosody
More repetition
Shorter utterances
More isolated words
More pauses
Slower speech rate
More questions
Lexically simpler

Distinct timbre
Simpler structures
Less lexical diversity
Fewer verbs
Hyperarticulation
Louder
Greater pitch variability
More even rhythm
Longer vowels
Higher emotionality

Brent & Siskind, 2001; Cooper & Aslin, 1990; Ferguson, 1964; Fernald, 1985; Payne et al., 2015; Phillips, 1973; Piazza et al., 2017; Soderstrom, 2007; Weisleder & Fernald, 2013; Werker et al., 2007; You et al., 2021; many others

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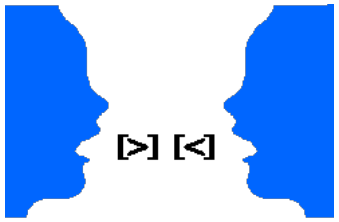
Corpus information – CHILDES



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Huttenlocher et al., 2010; Rowe, 2008

*Other-produced utterances

Other-produced utterances in CHILDES

CDL REGISTER

>83% from primary caregivers,
Majority addressed to target child

ADL REGISTER

Higher pitch
Exaggerated prosody
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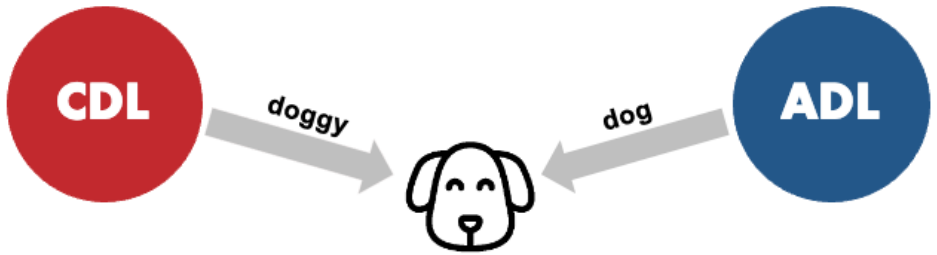


Predictions

Utterances with ADL variants will have…

PROSODIC

- Lower mean pitch
- Narrower pitch range
- Faster speech rate

LEXICAL

- More late-AoA words
- More rare words

SYNTACTIC

- More words overall
- More verb phrases

Boersma & Weenick, 2016; Braginsky et al., 2021; Foushee et al., 2016; Honnibal et al., 2020; Kuperman et al., 2012; MacWhinney, 2000

General analysis template

Mixed-effects binomial logistic regression

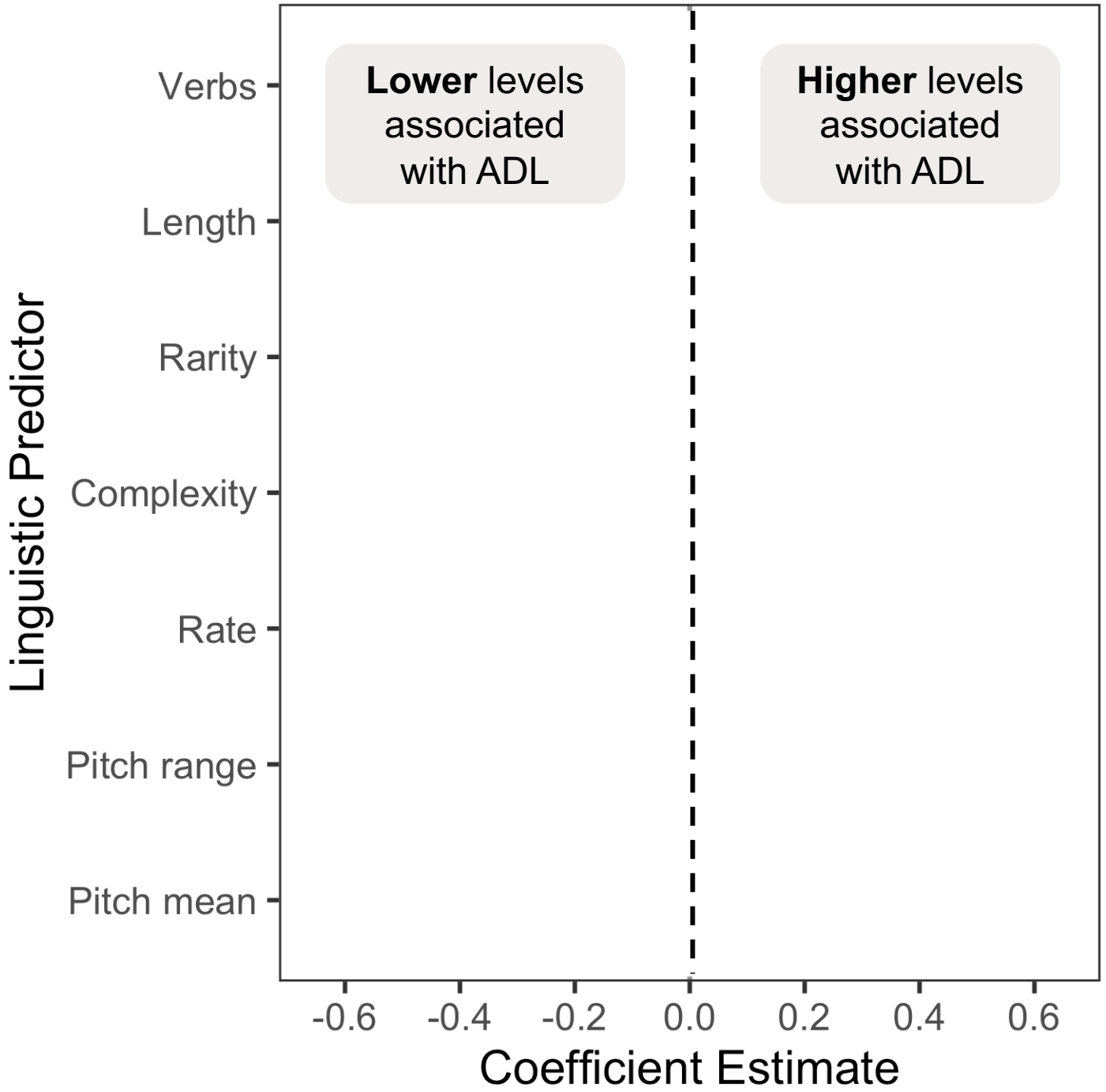
variant ~ linguistic feature * age + (1 | pair) + (1 | speaker)

PROSODIC

LEXICAL

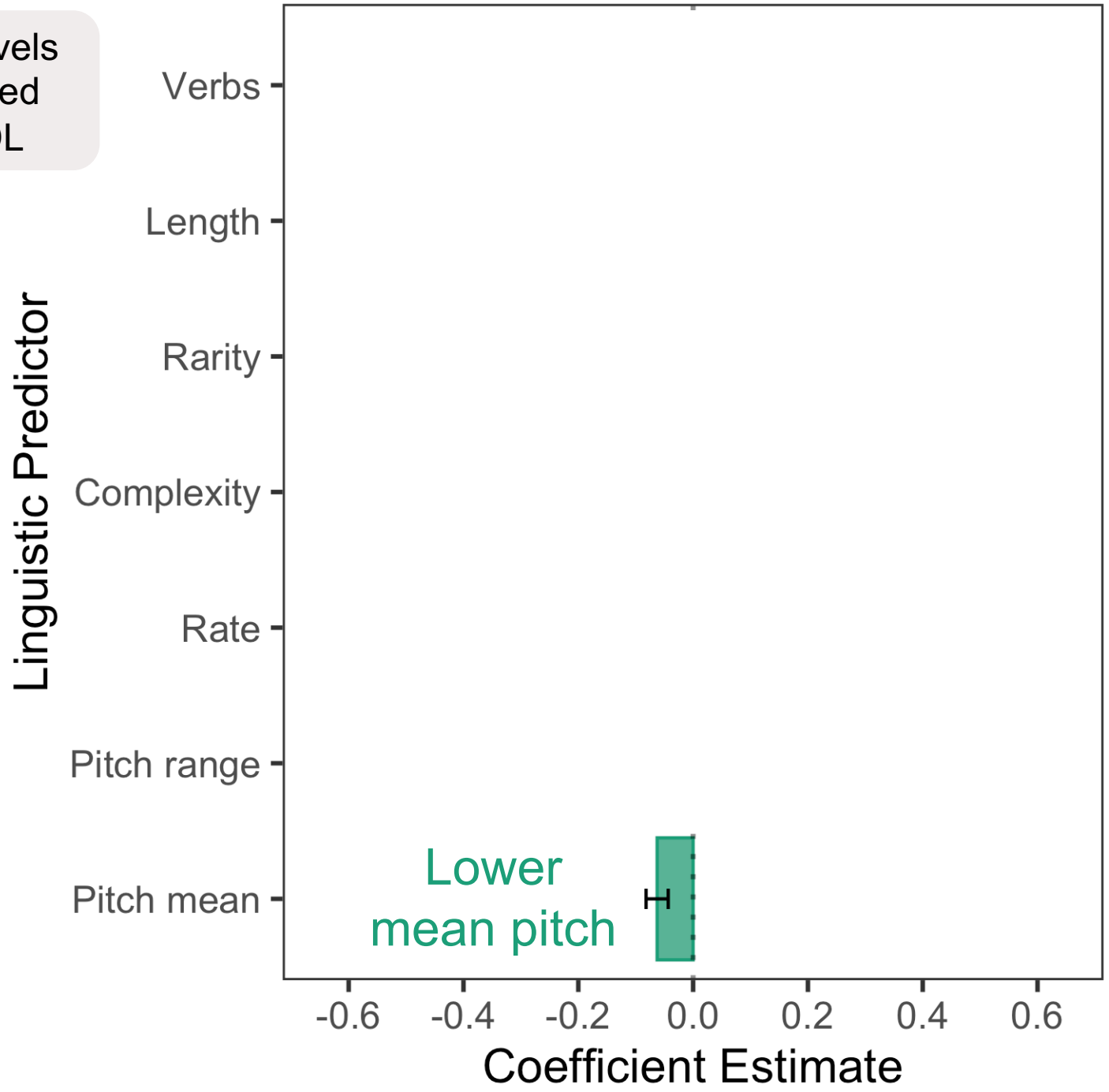
SYNTACTIC

Bates et al., 2015


Lower levels associated with ADL
Higher levels associated with ADL
Linguistic Predictor
Verbs
Length
Rarity
Complexity
Rate
Pitch range
Pitch mean
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
Coefficient Estimate

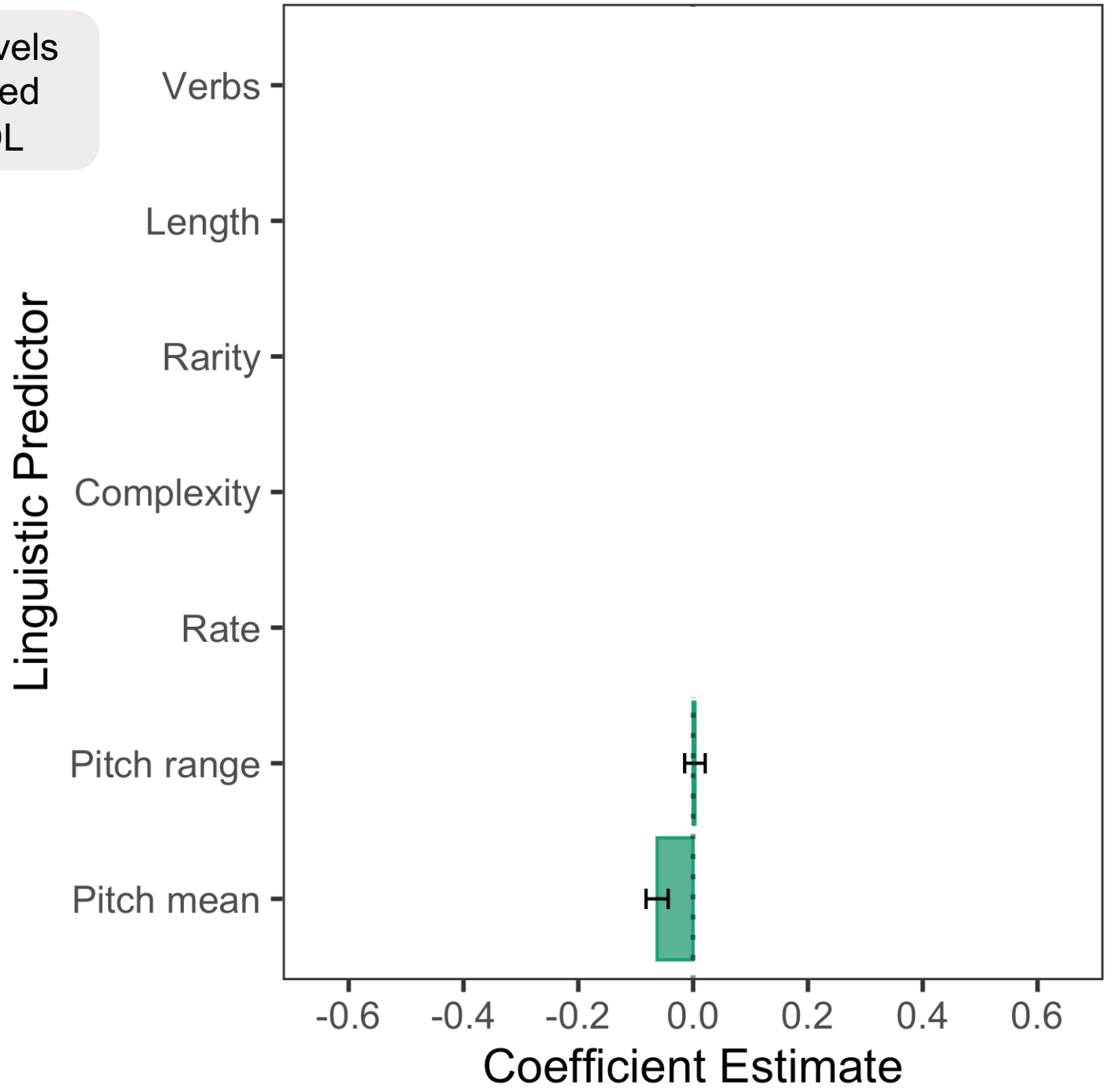
Lower levels associated with ADL

Higher levels associated with ADL



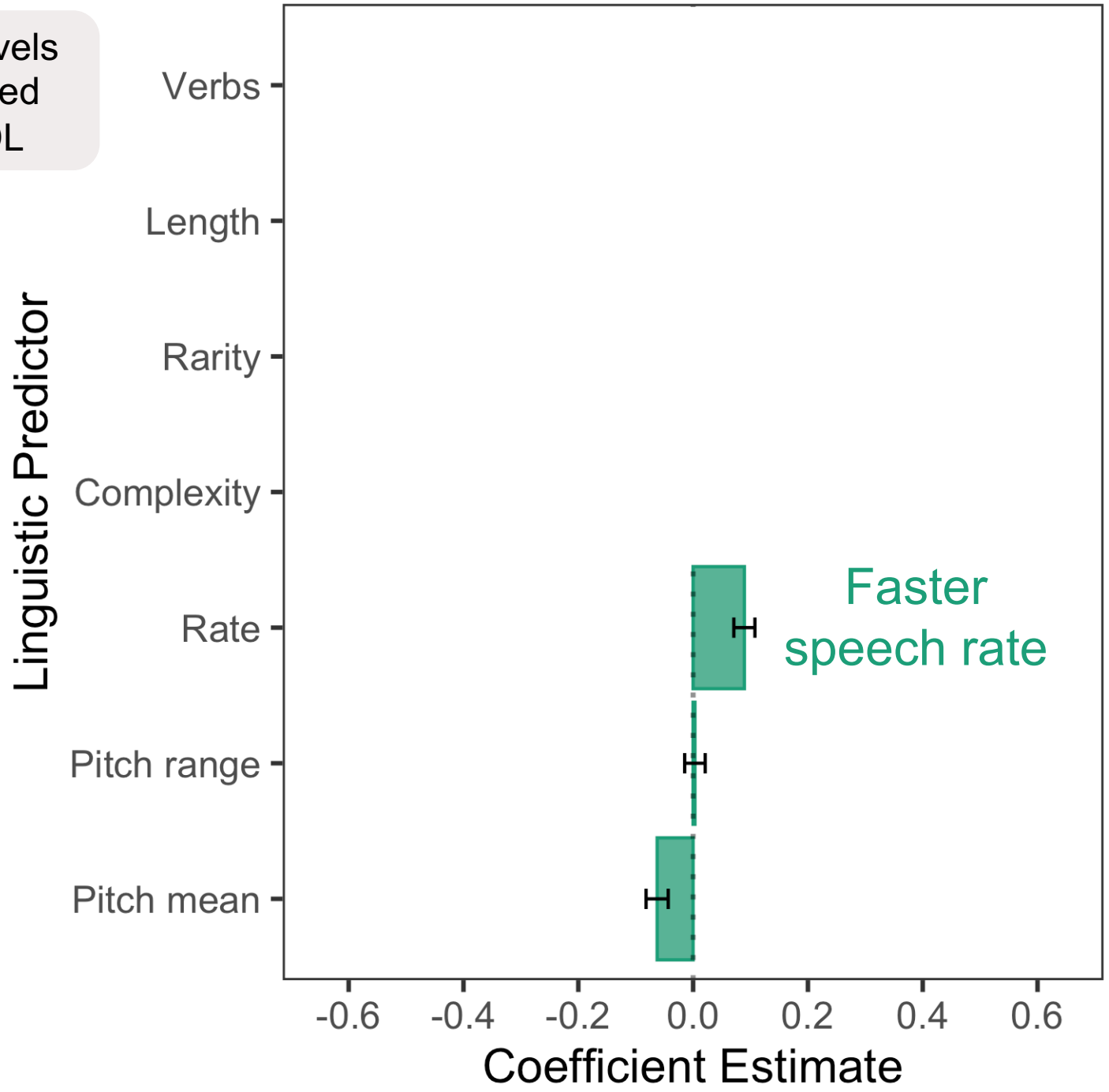
Lower levels associated with ADL

Higher levels associated with ADL



Lower levels associated with ADL

Higher levels associated with ADL



Lower levels associated with ADL

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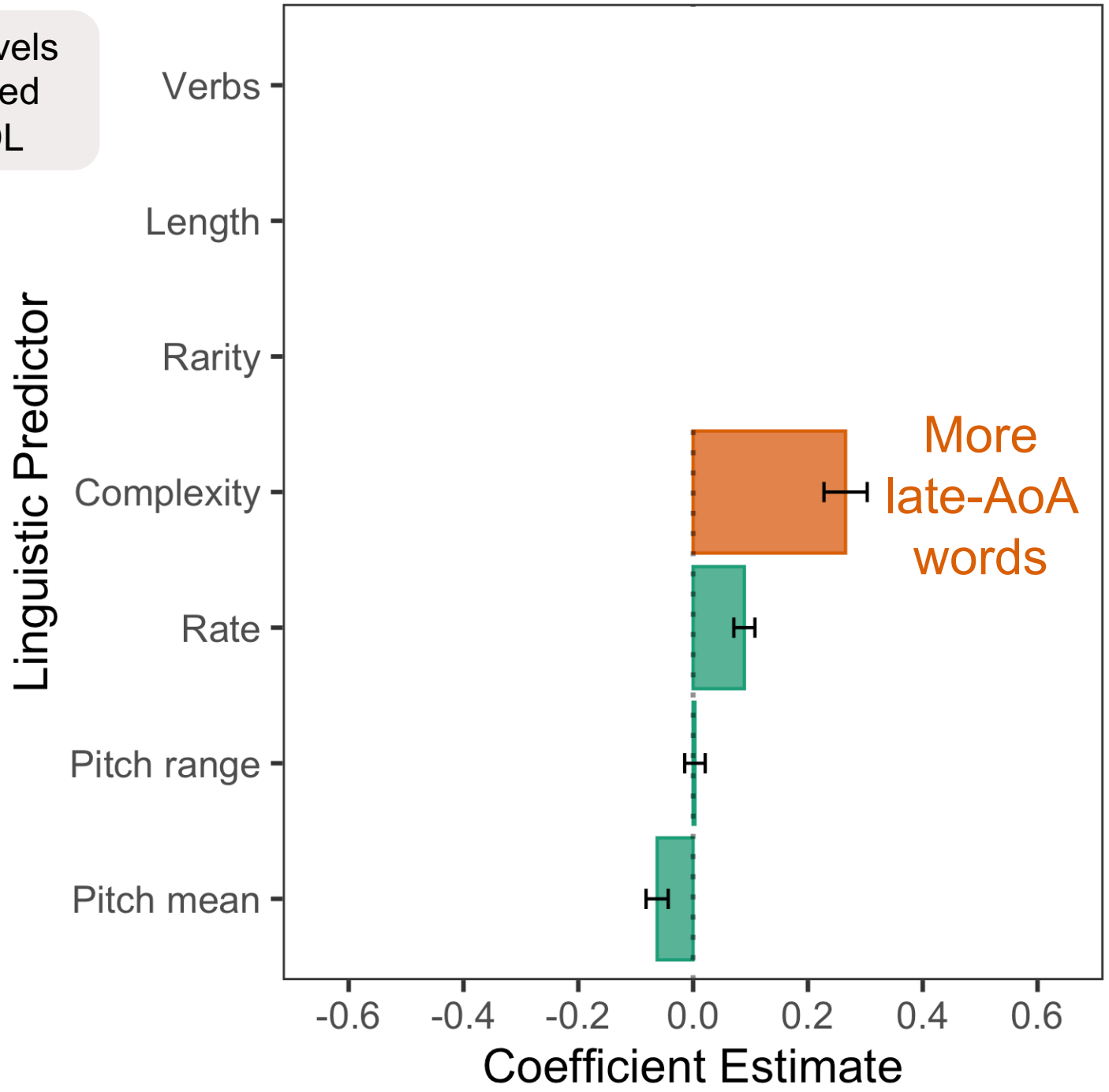

Lower levels associated with ADL

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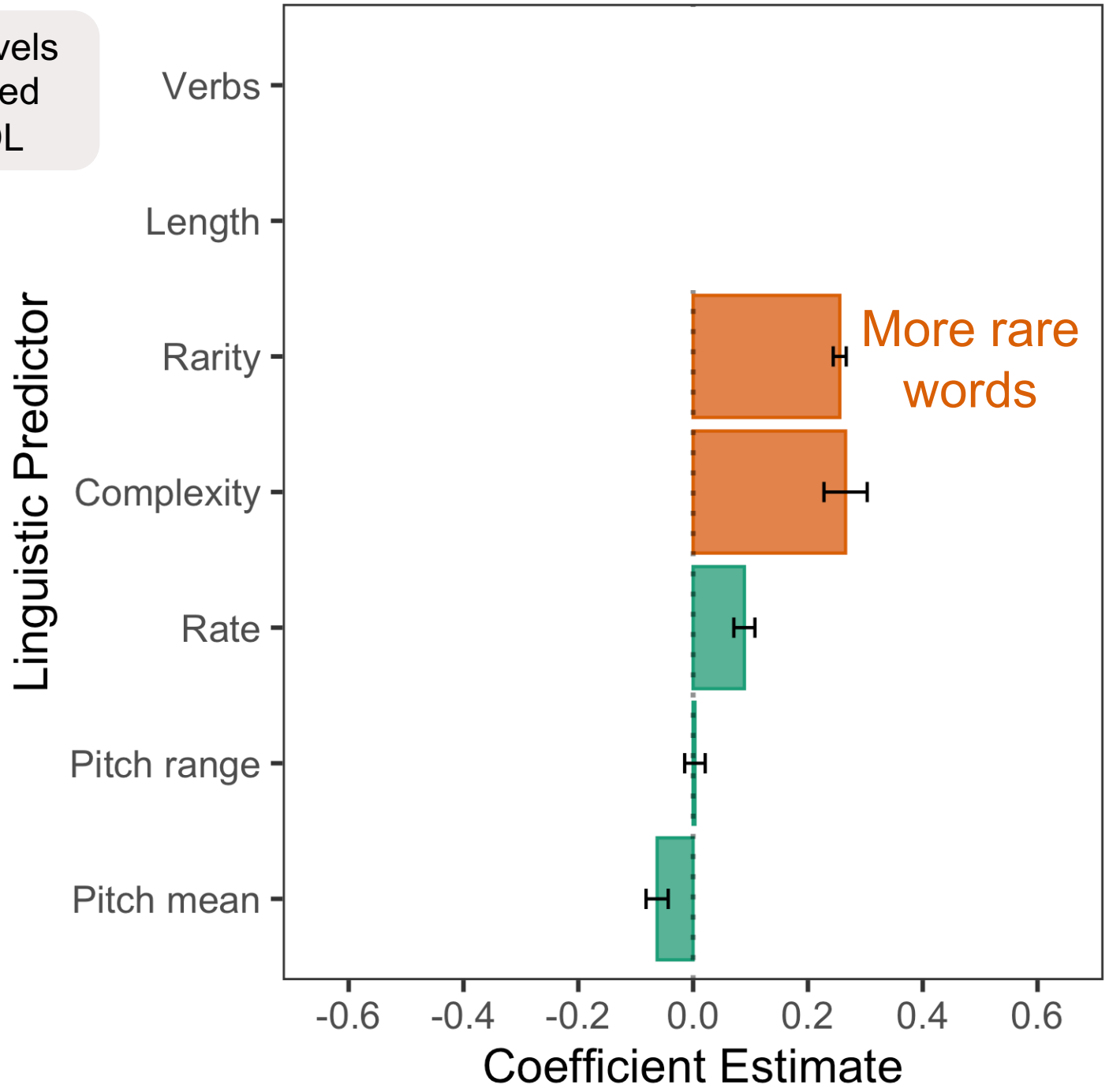
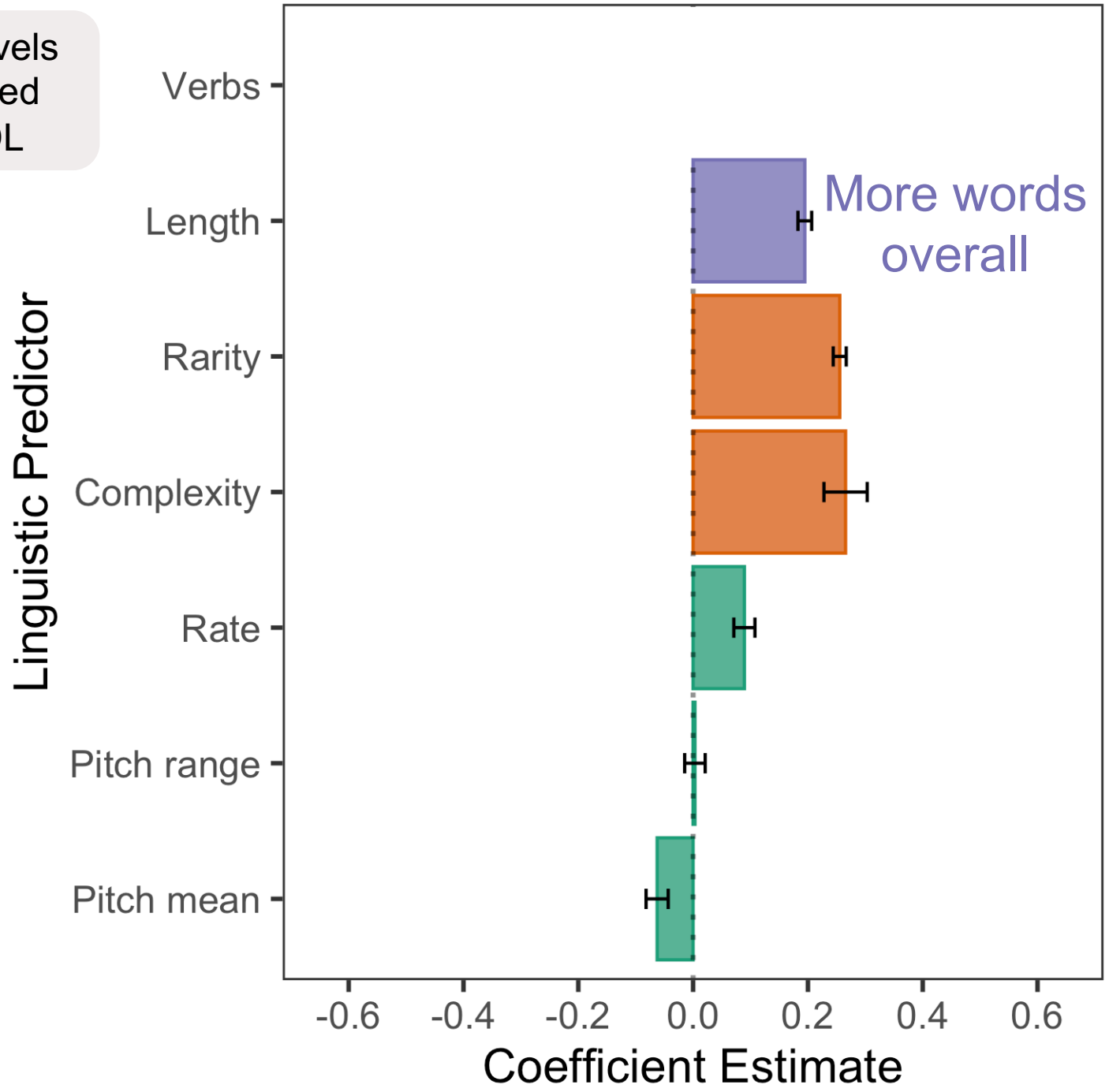
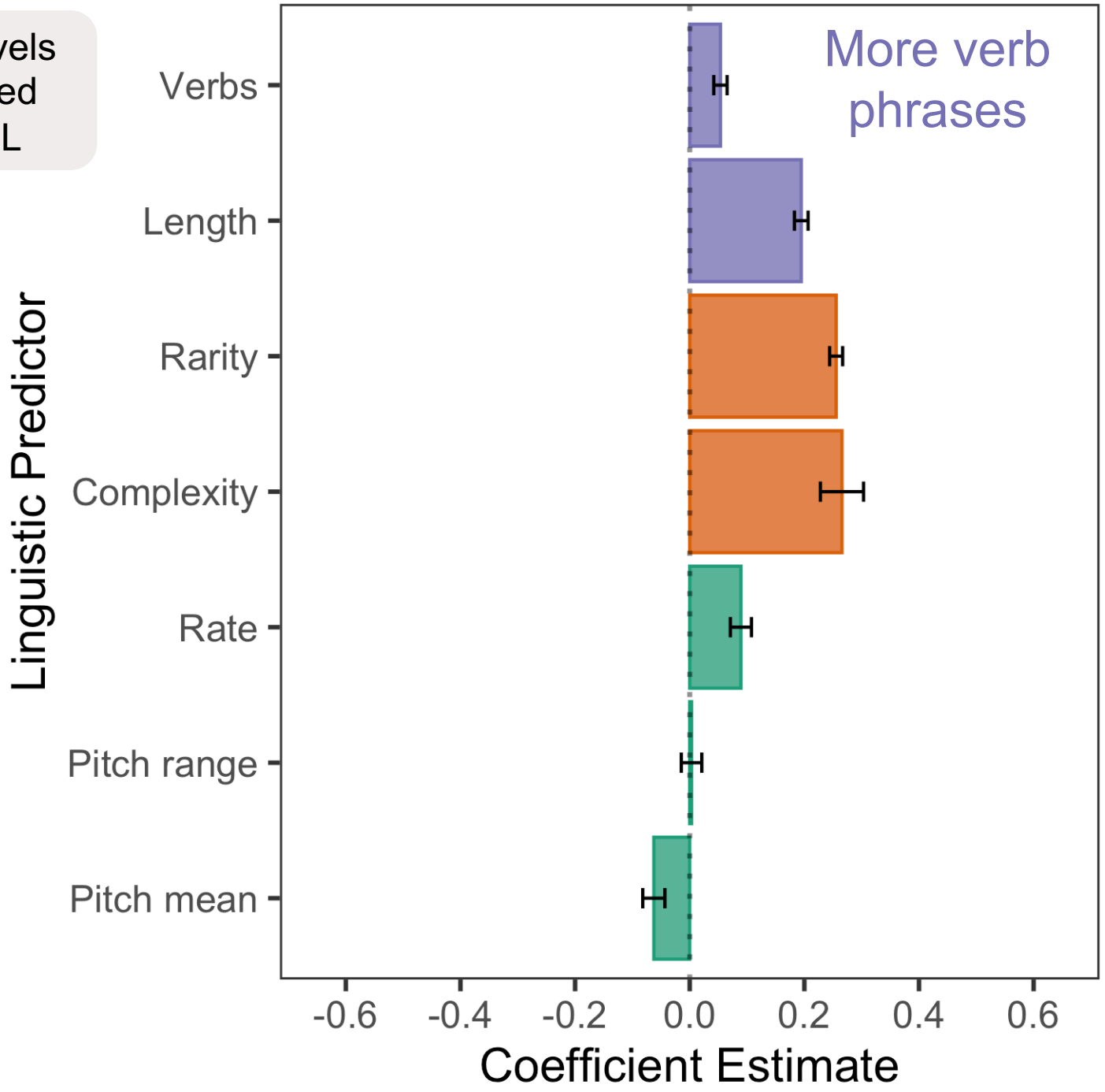


Lower levels associated with ADL

Higher levels associated with ADL



Lower levels associated with ADL



Higher levels associated with ADL

Part 2: Distinct linguistic contexts for CDL vs. ADL variants even in CDL register

Utterances with ADL variants have…

PROSODIC

- Lower mean pitch
- Narrower pitch range
- Faster speech rate

LEXICAL

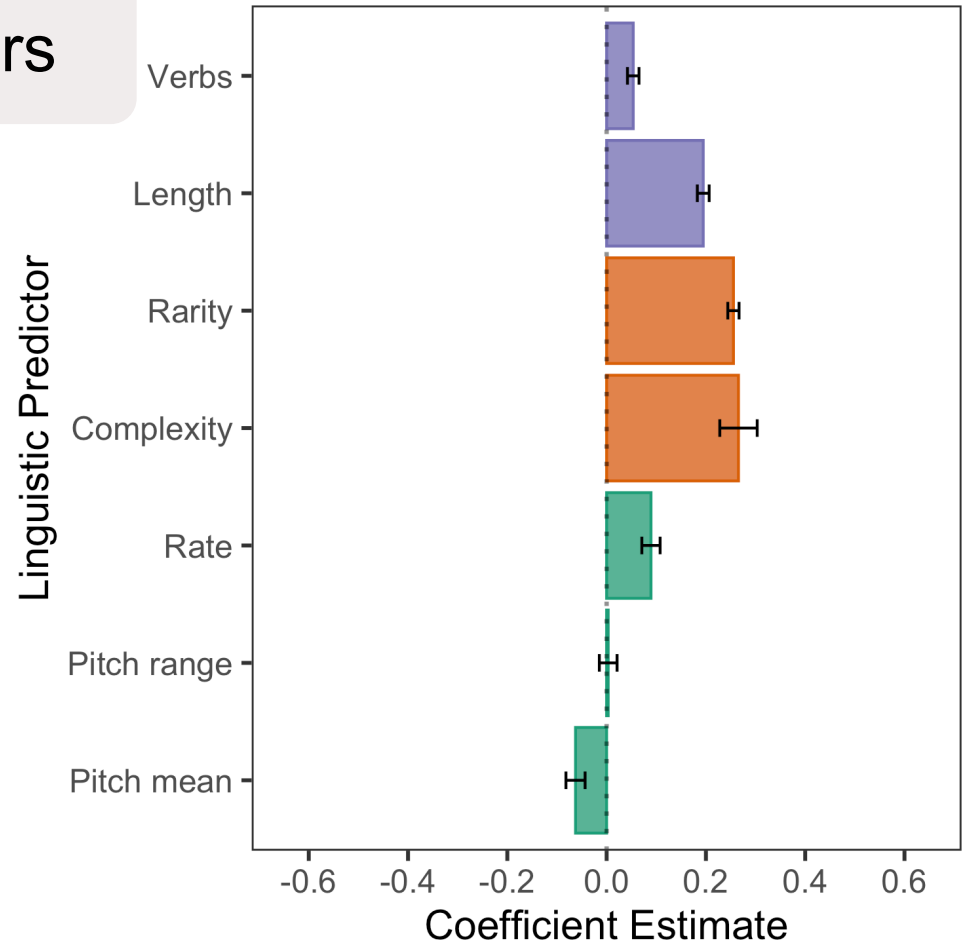
- More late-AoA words
- More rare words

SYNTACTIC

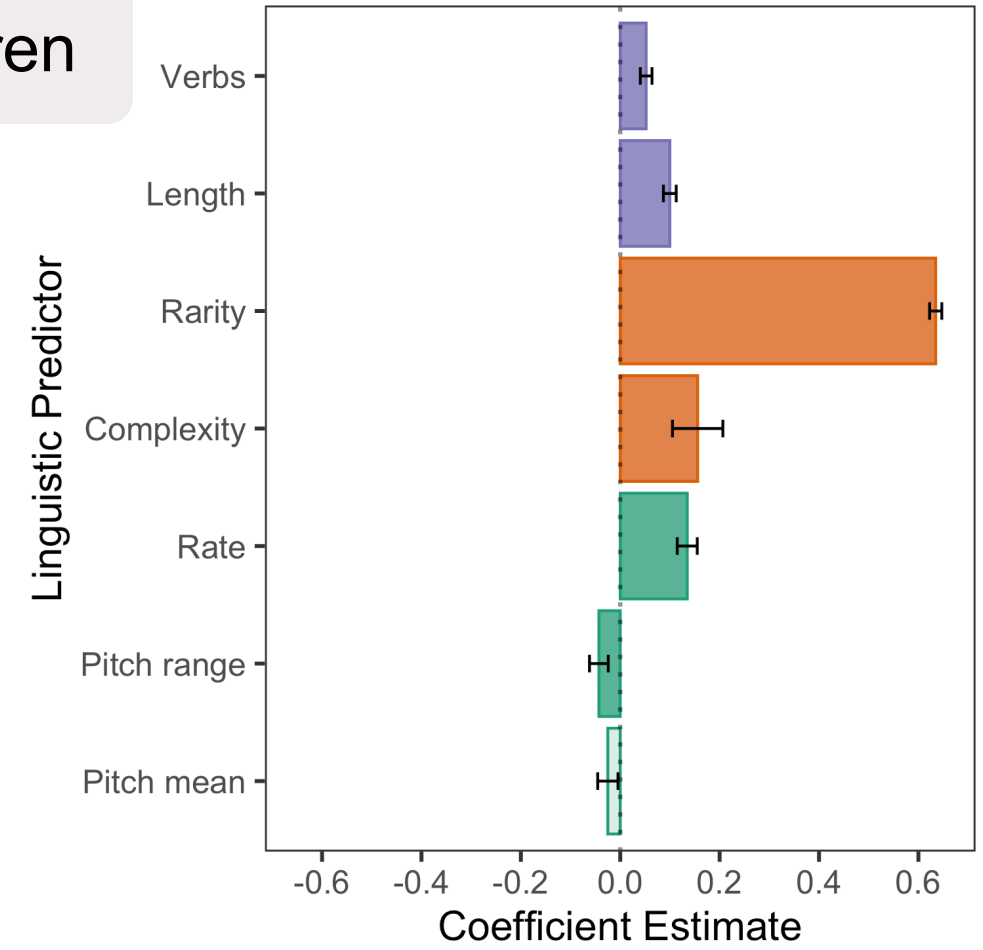
- More words overall
- More verb phrases

Part 2: Distinct linguistic contexts for CDL vs. ADL variants even in CDL register

others



children



CDL / ADL utterance classifier

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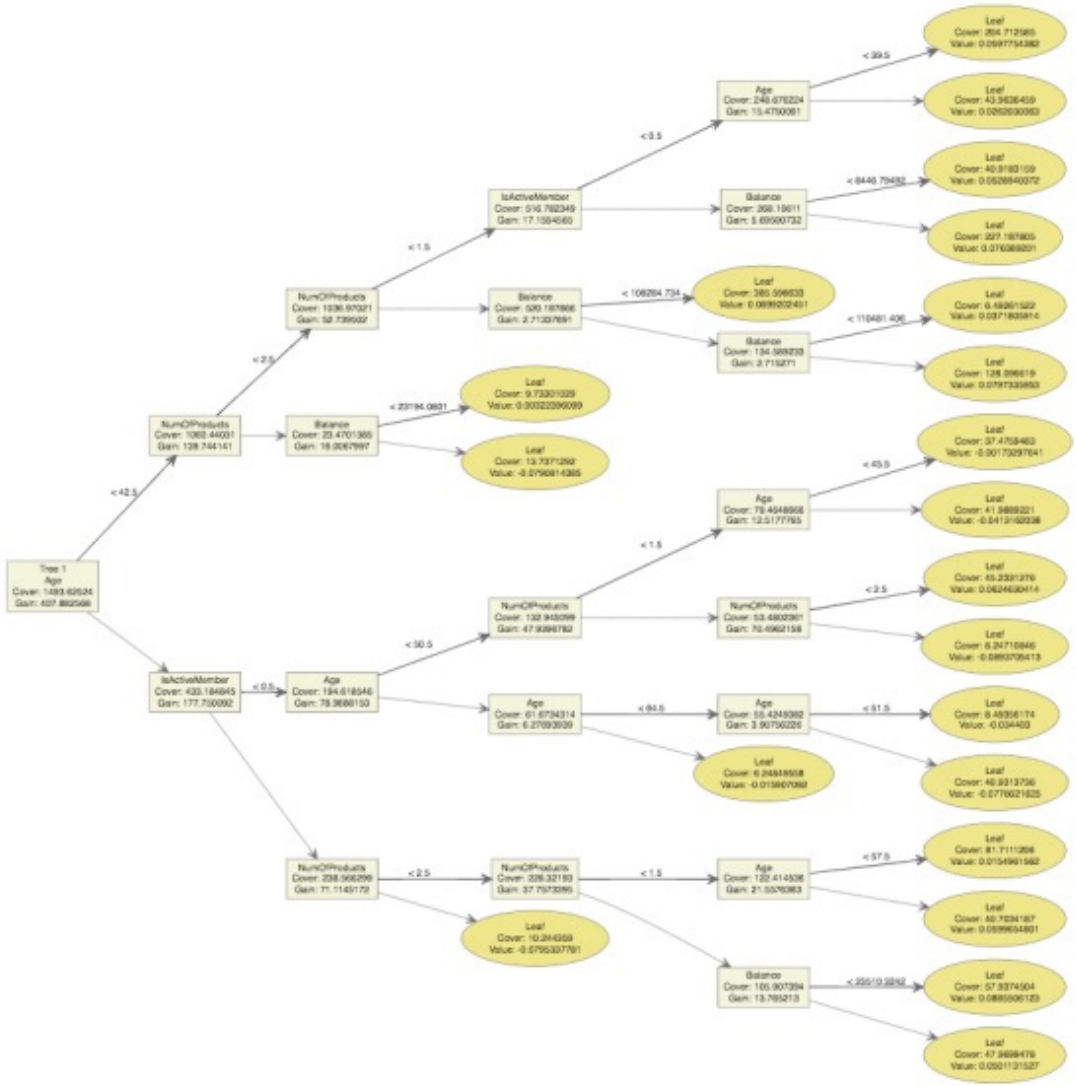
CDL / ADL utterance classifier

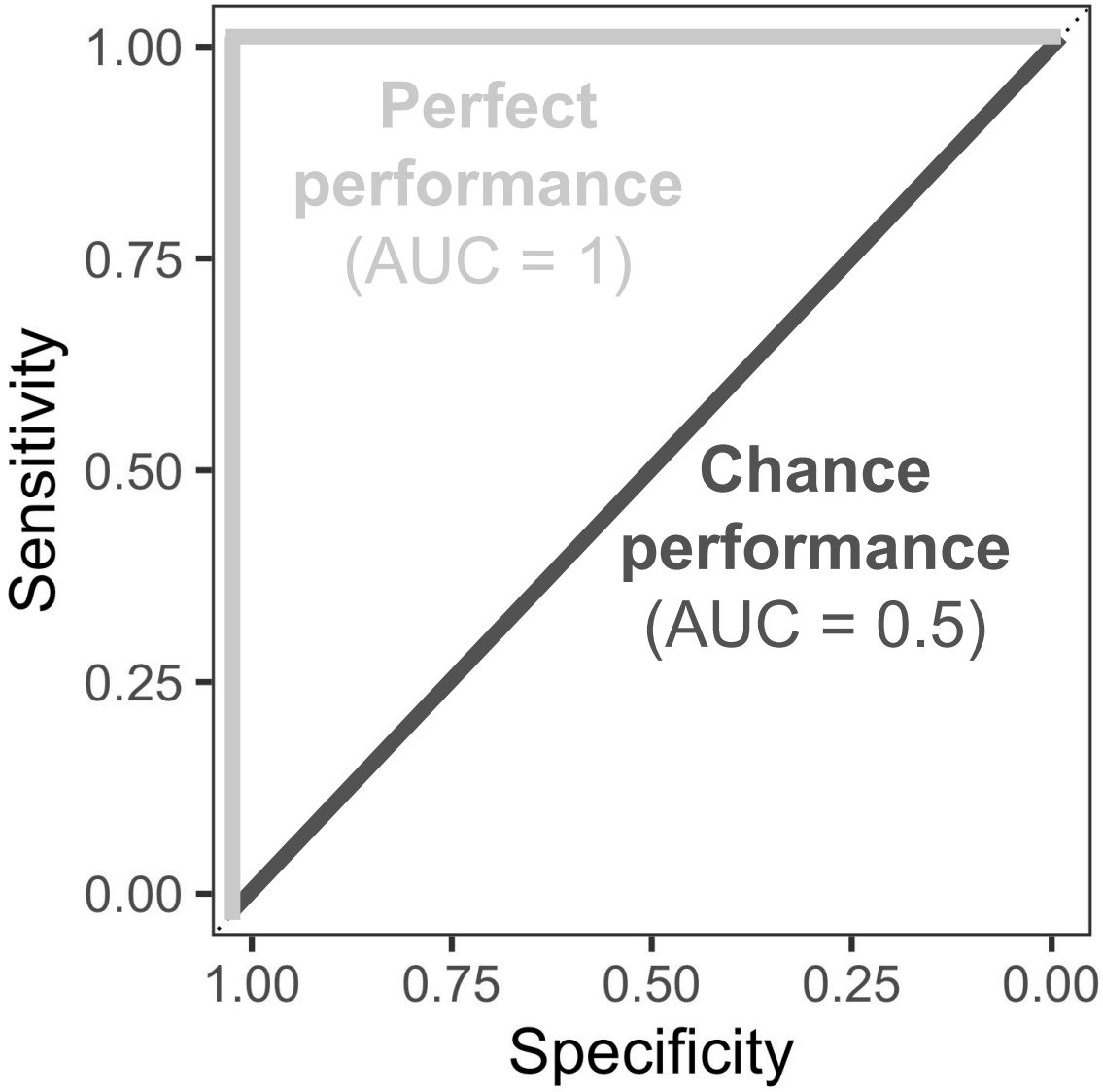


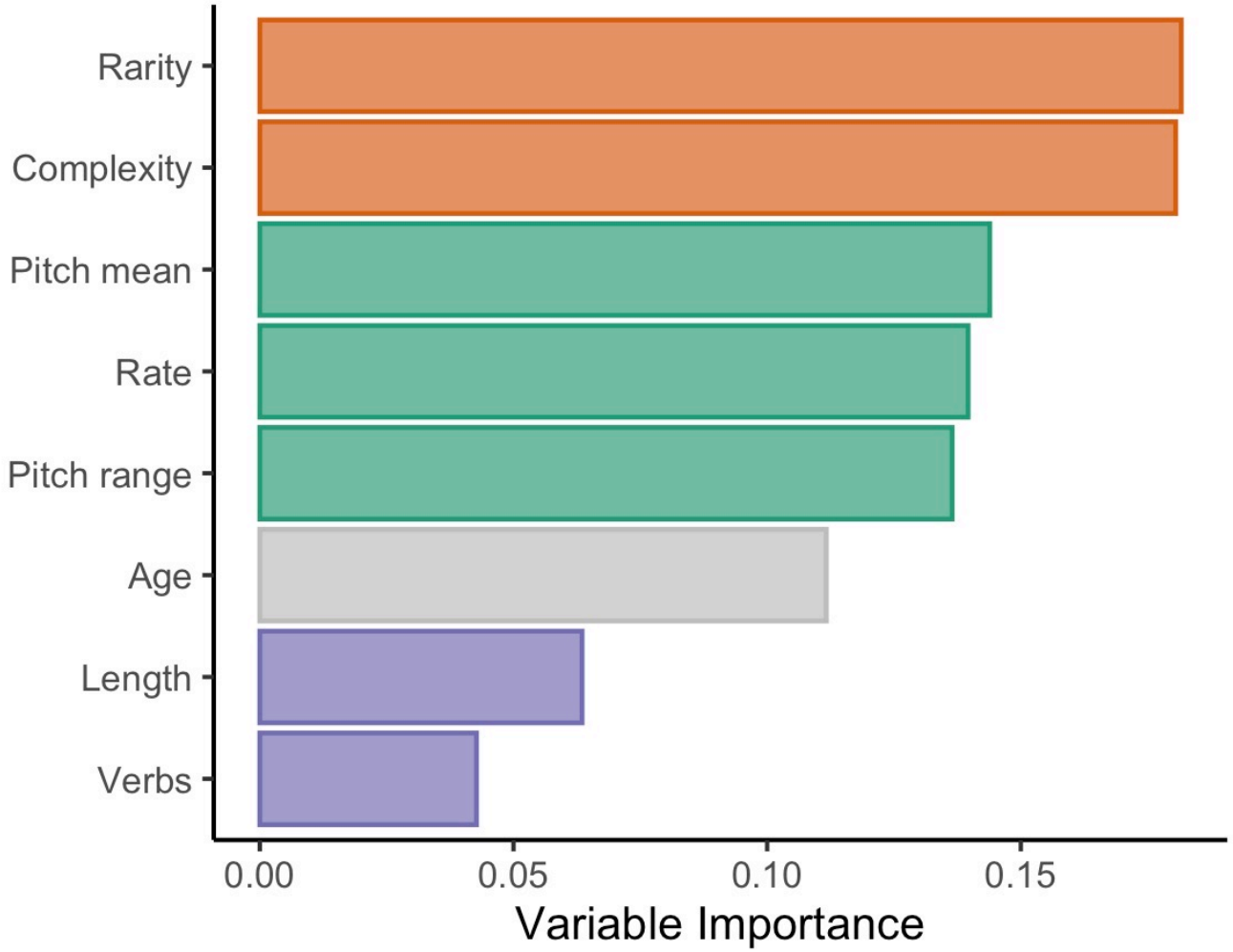
Extreme gradient boosting machine (XGBoost)

- Other-produced utterances
- Train 90%
- Test 10%

Following Bang et al., in prep: LENA CDL vs. ADL

CDL / ADL utterance classifier





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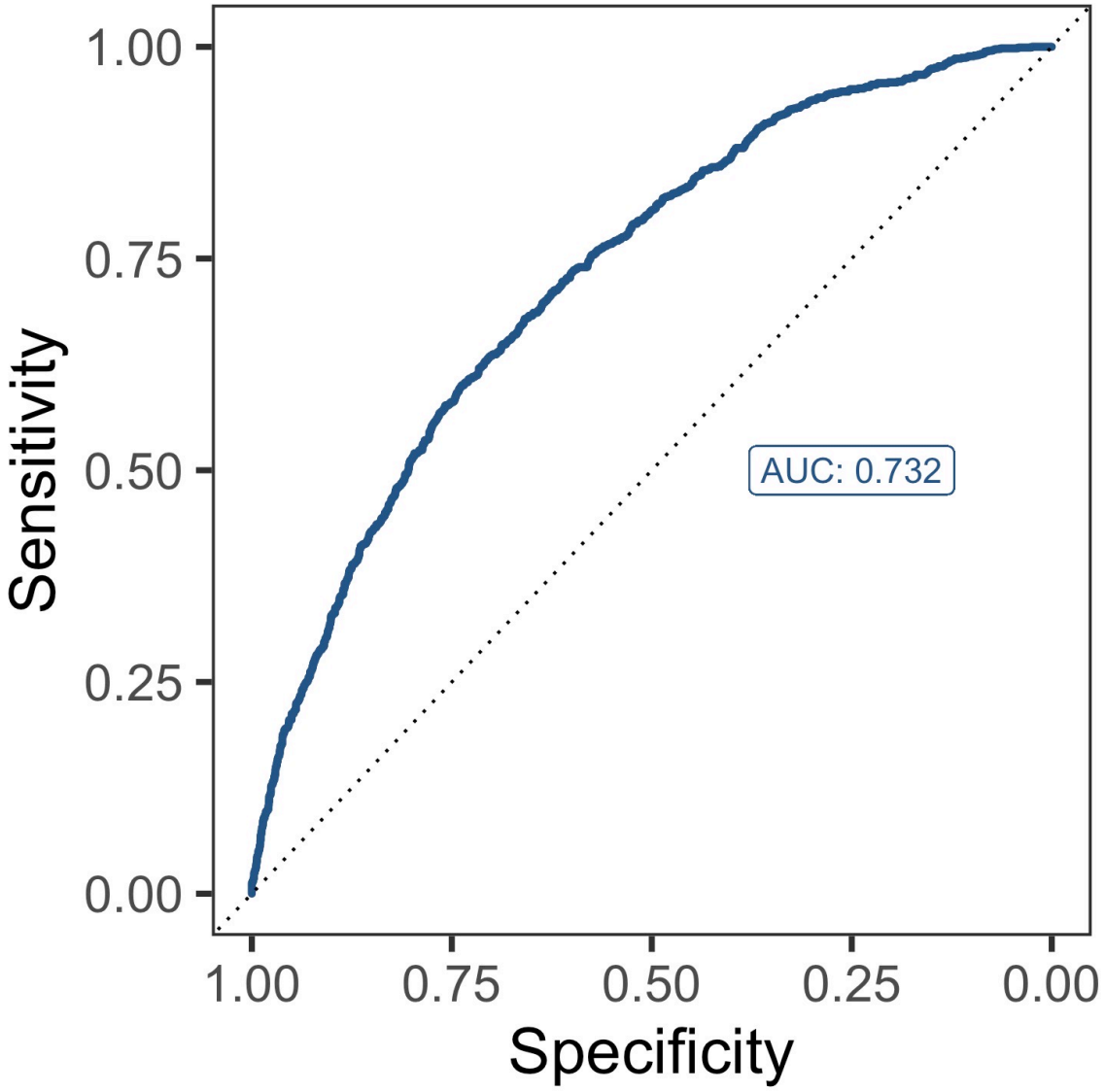
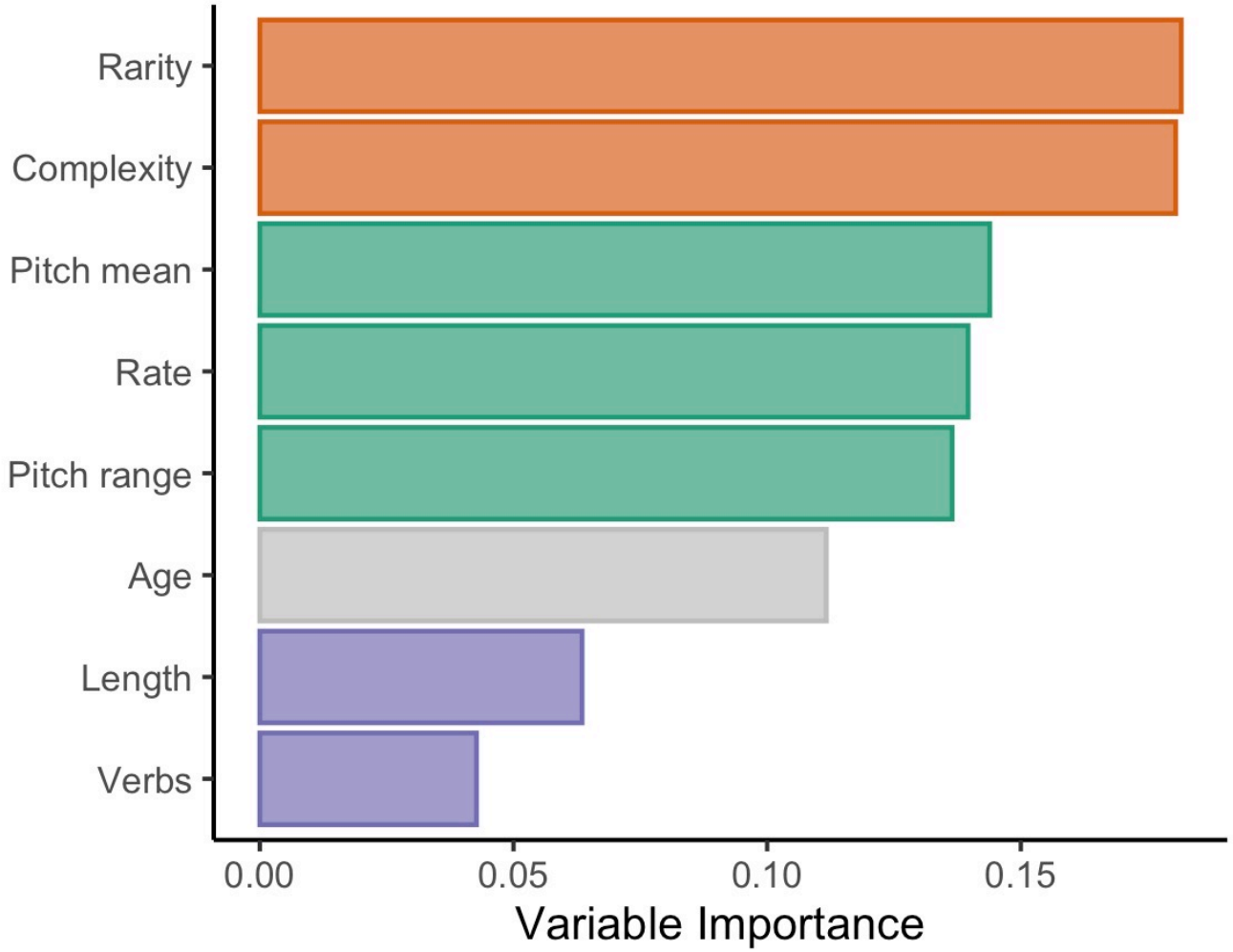
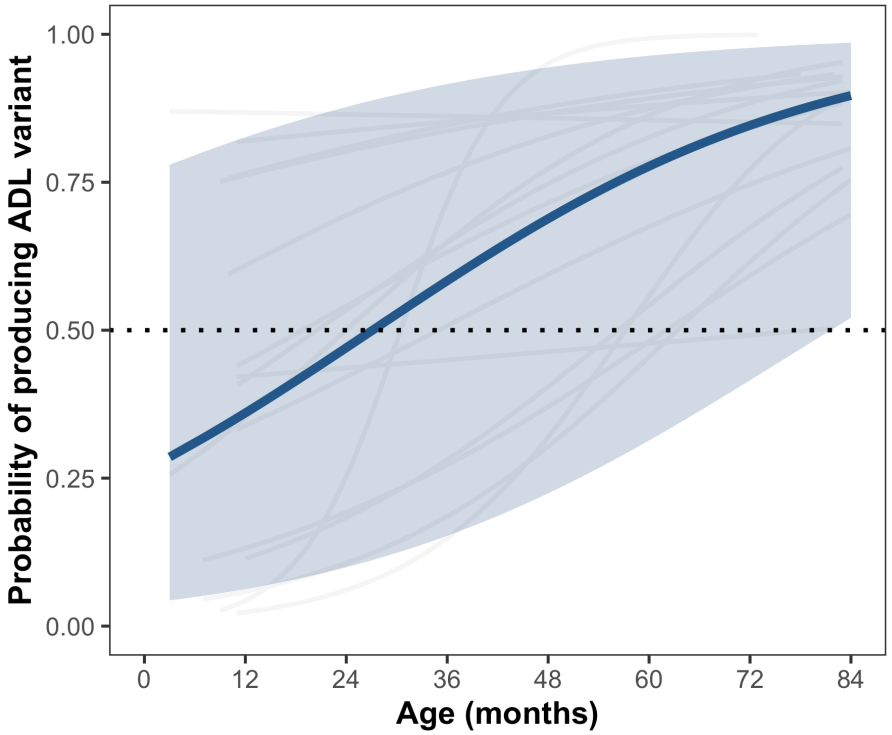


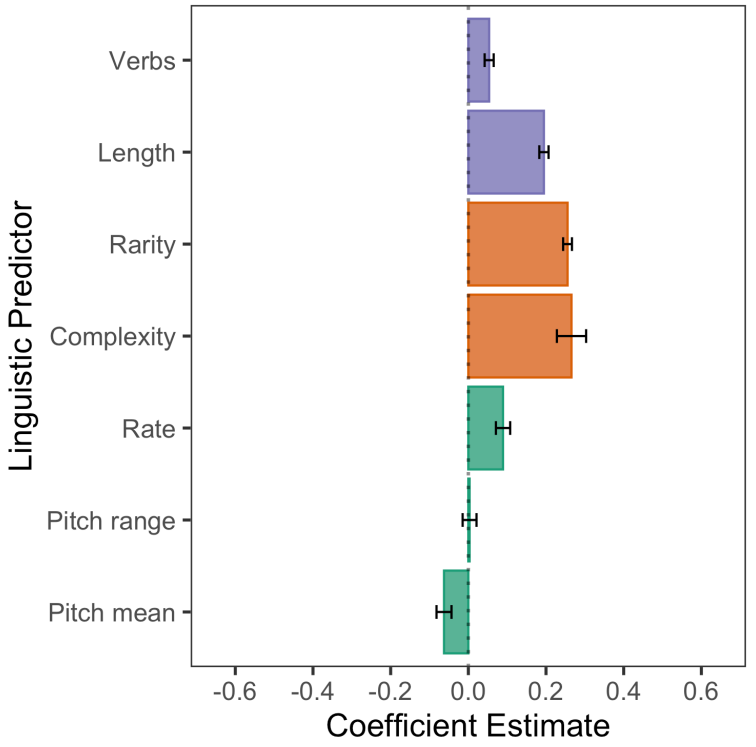


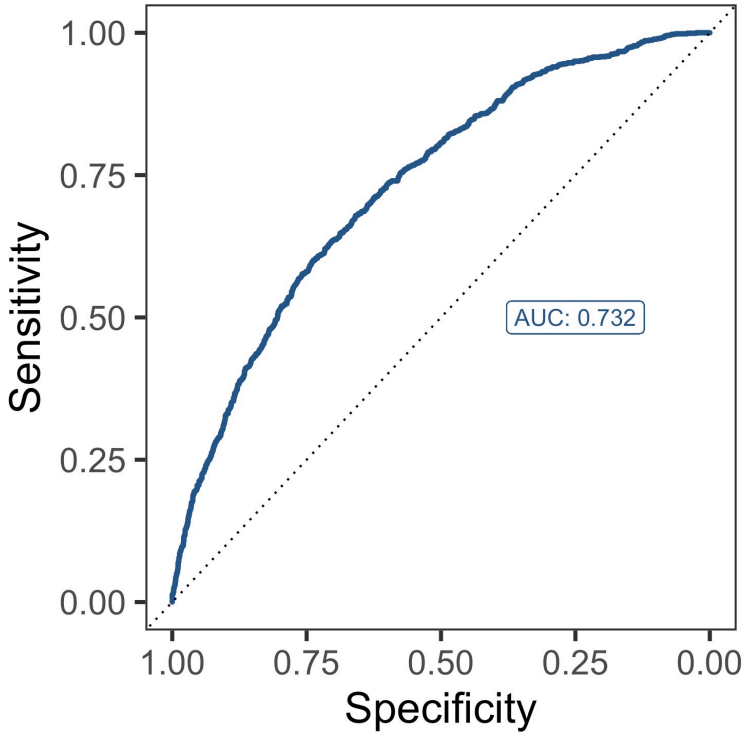
CDL-to-ADL vocabulary shift

Part 1: When?



Part 2: How?





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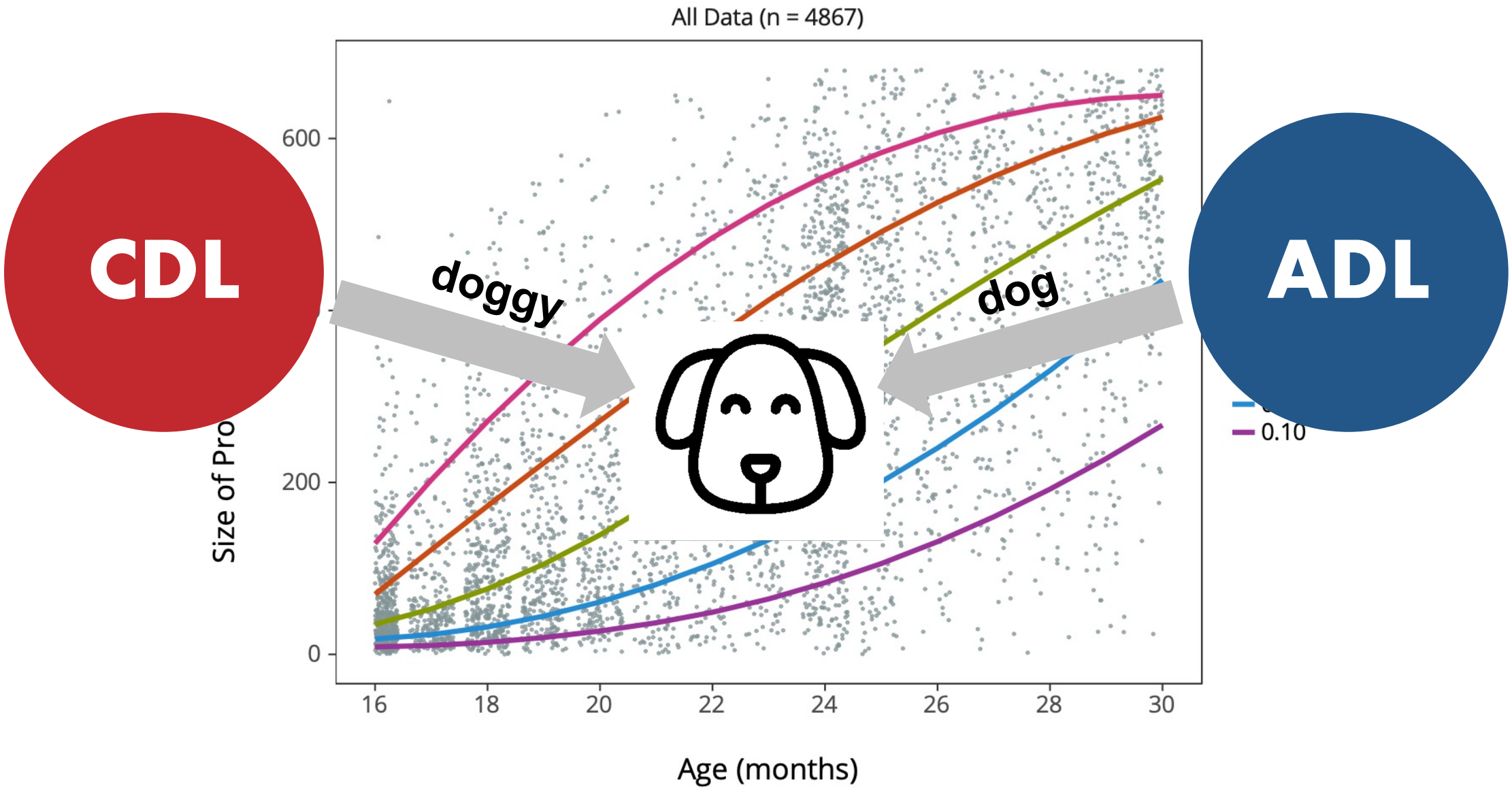
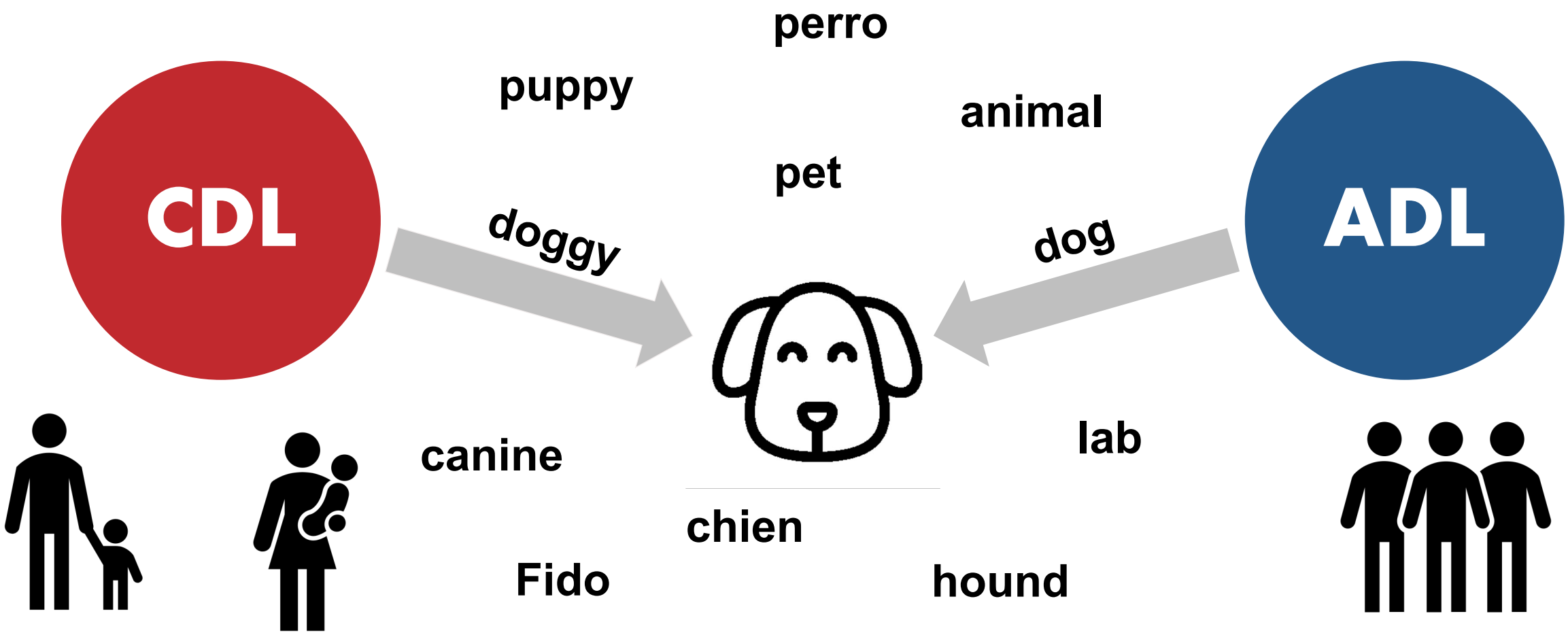


Prevalence of lexical variation



Kalashikova et al., 2016, 2019; Kandhadai et al., 2016; Nicoladis & Laurent, 2020; Potter & Lew-Williams, under review; Zinszer et al., 2017

Thank you!

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chatter lab

THE UNIVERSITY OF CHICAGO LDP LANGUAGE DEVELOPMENT PROJECT

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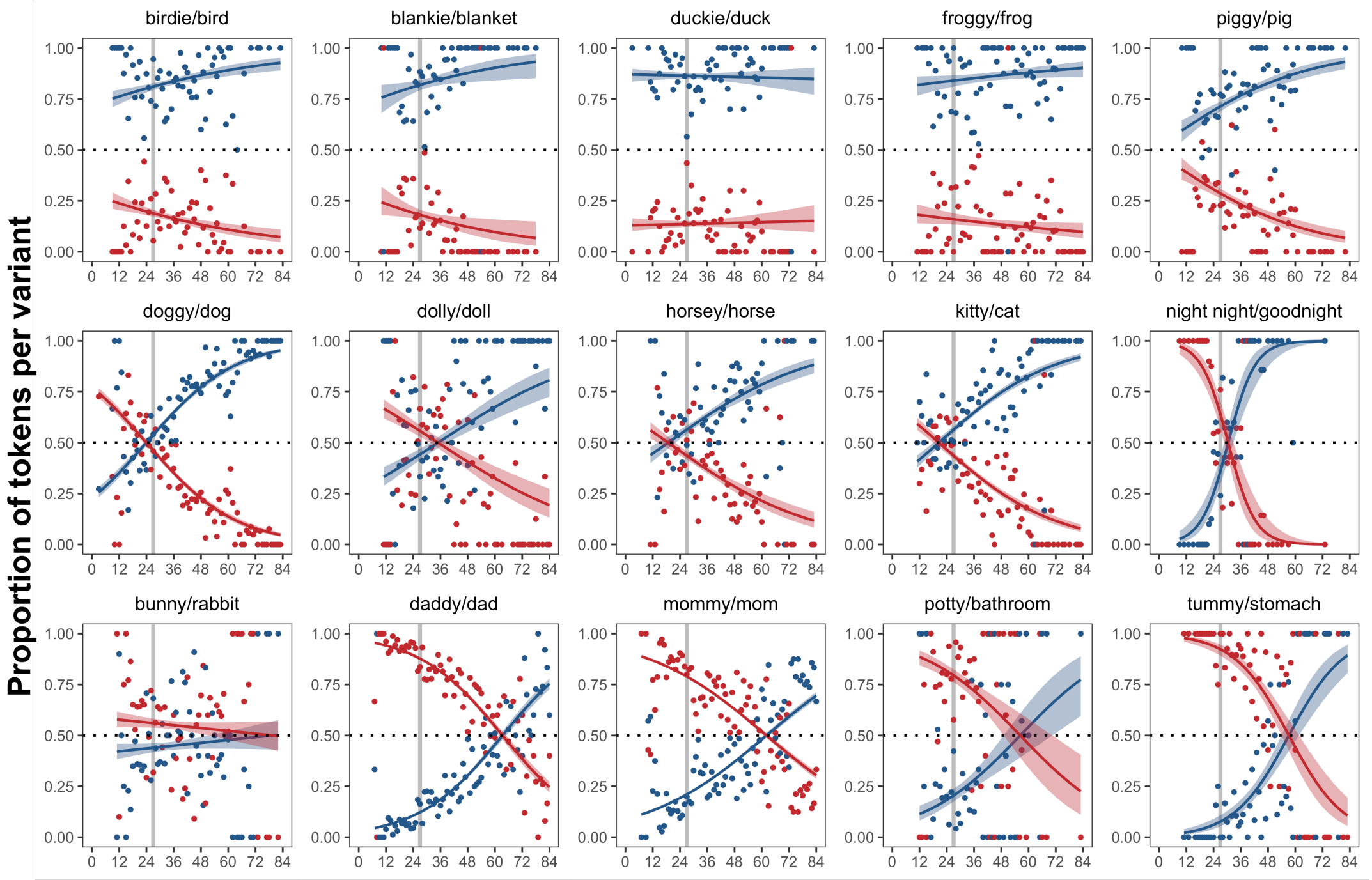
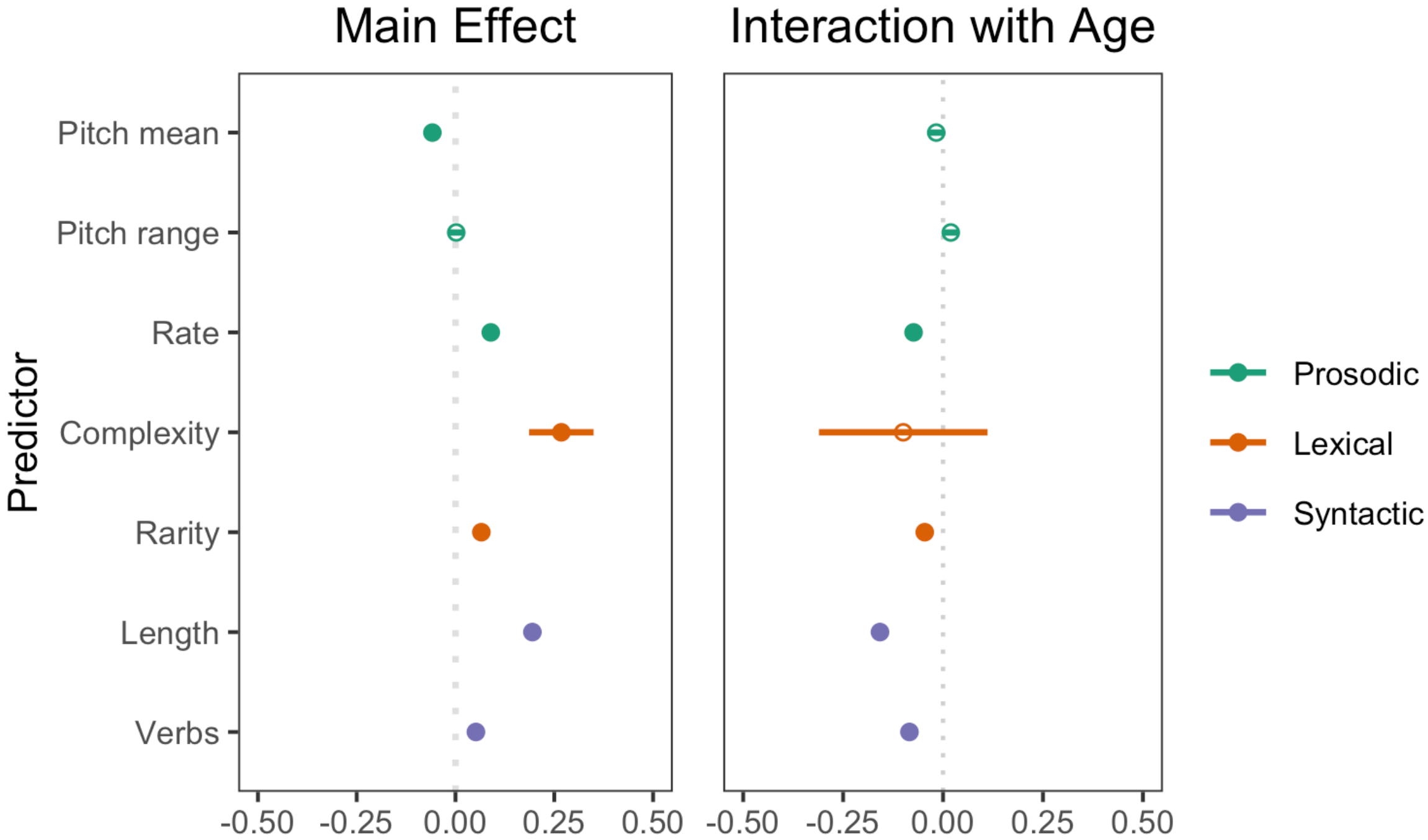
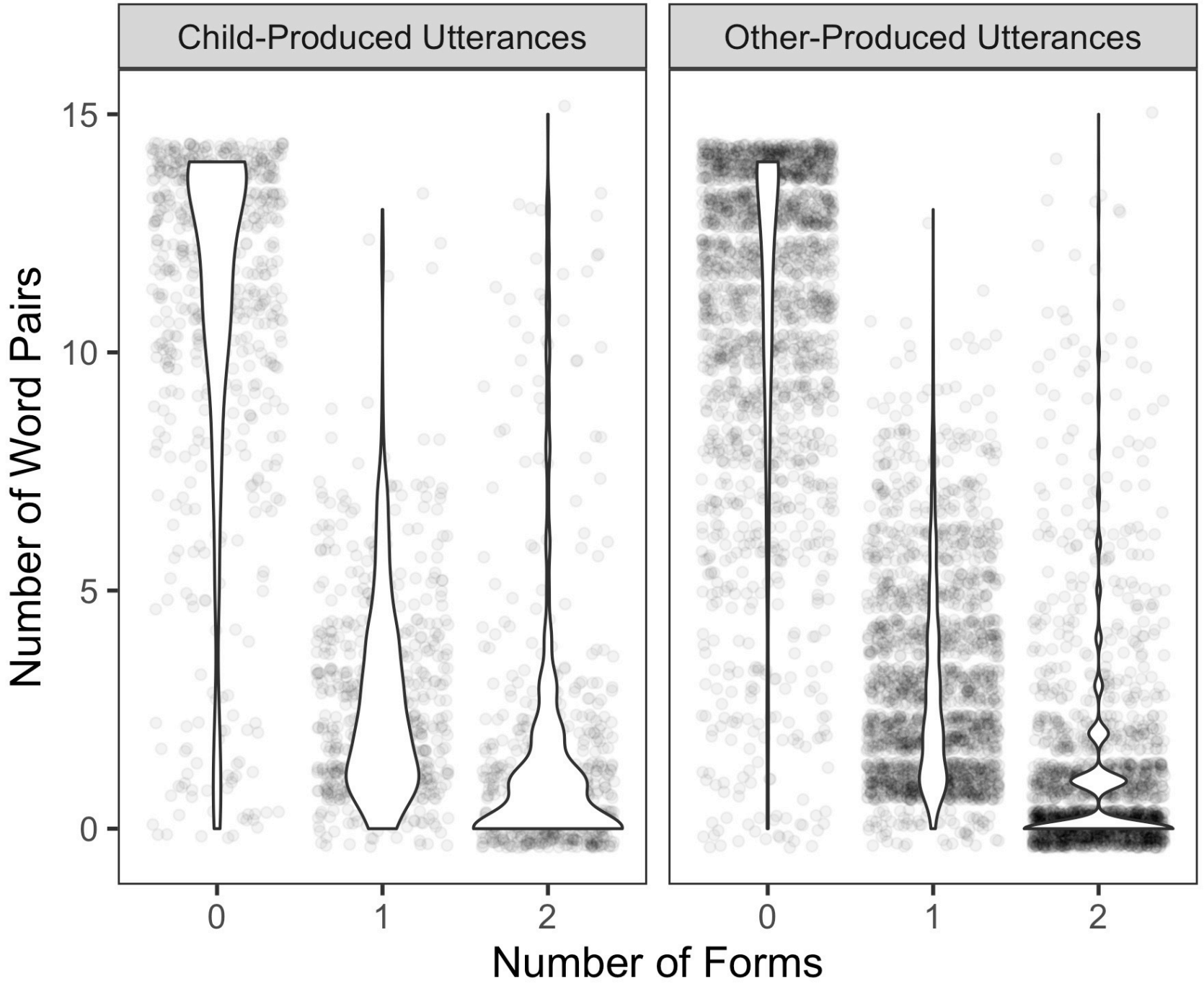
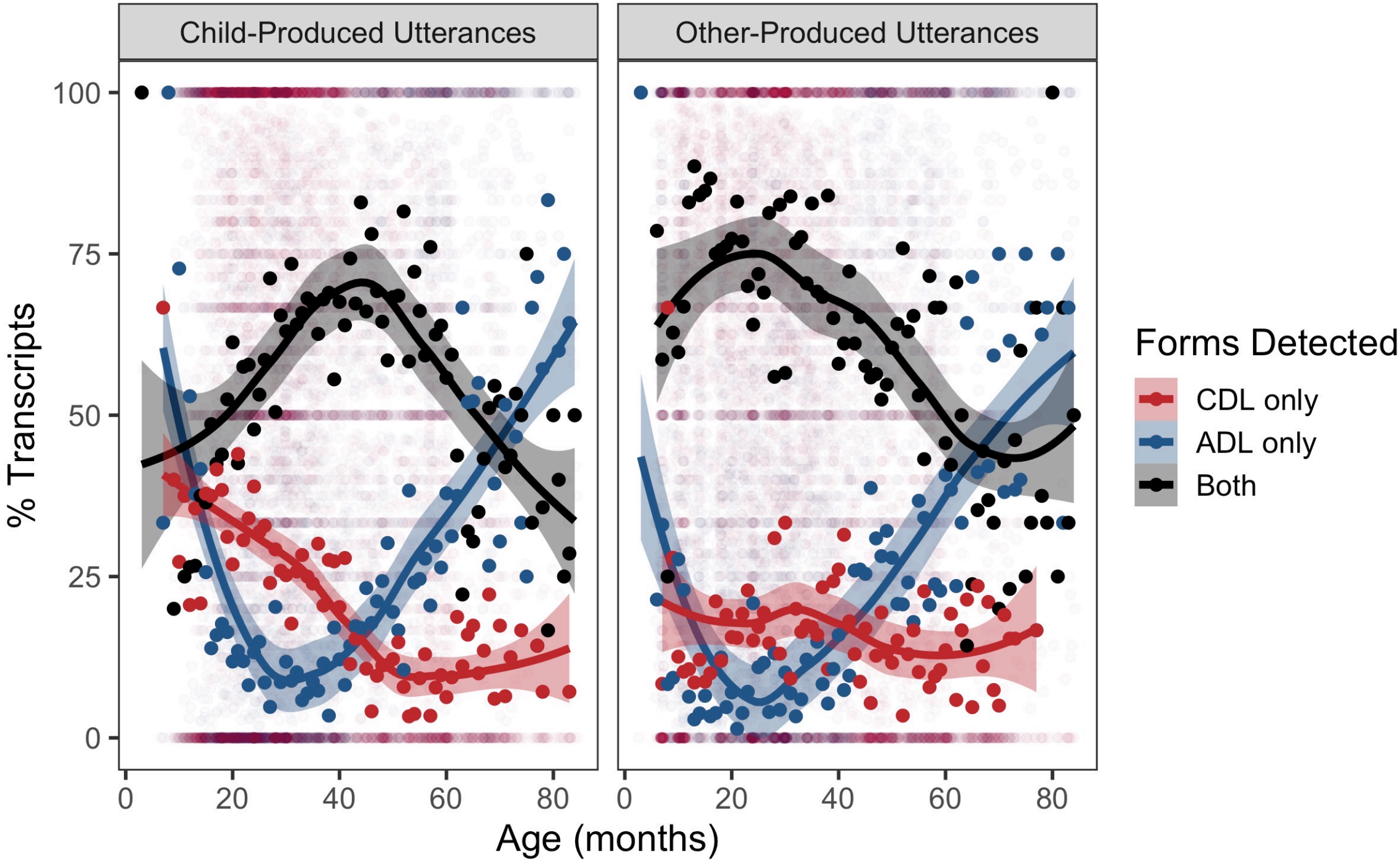

birdie/bird
blankie/blanket
duckie/duck
froggy/frog
piggy/pig
doggy/dog
dolly/doll
horsey/horse
kitty/cat
night night/goodnight
bunny/rabbit
daddy/dad
mommy/mom
potty/bathroom
tummy/stomach
Proportion of tokens per variant
Age (months)
0.00
0.25
0.50
0.75
1.00
0
12
24
36
48
60
72
84


Main Effect
Interaction with Age
Predictor
Pitch mean
Pitch range
Rate
Complexity
Rarity
Length
Verbs
-0.50
-0.25
0.00
0.25
0.50
Prosodic
Lexical
Syntactic


Child-Produced Utterances
Other-Produced Utterances
Number of Word Pairs
15
10
5
0
0
1
2
0
1
2
Number of Forms


Child-Produced Utterances
Other-Produced Utterances
% Transcripts
100
75
50
25
0
0
20
40
60
80
Age (months)
Forms Detected
CDL only
ADL only
Both