The Role of Family in Early Literacy Development

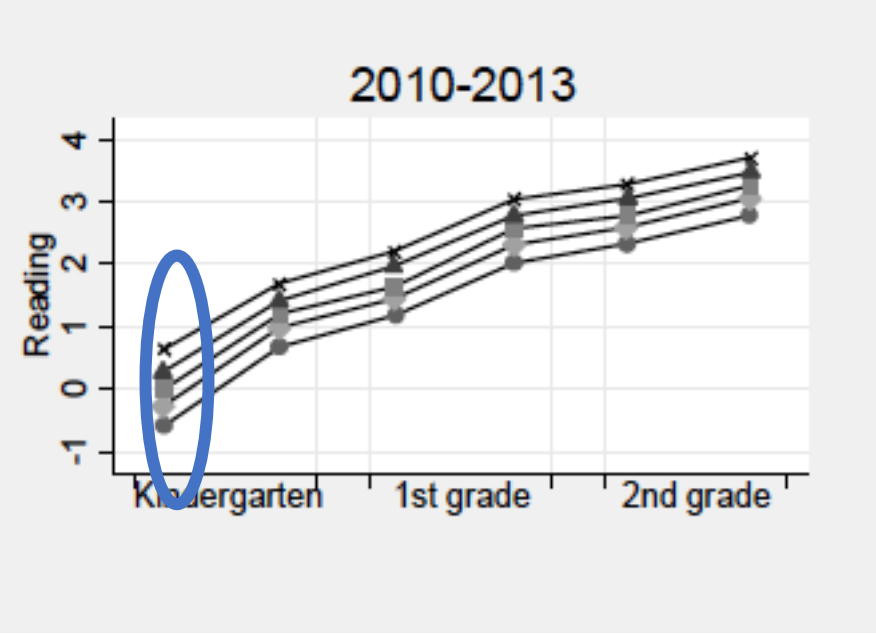
Meredith Rowe

ProLEER

Oct 4th 2023

Why is *early* language development so important?

Income Achievement Gap in Reading



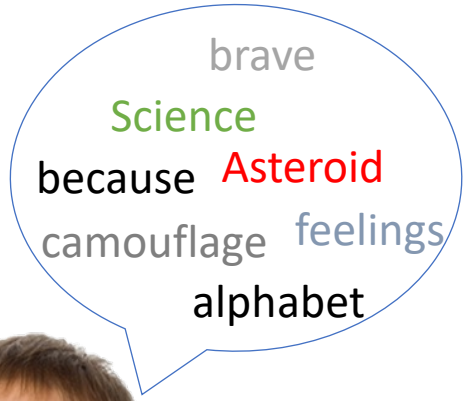
Mean scores by SES quintile

(Von Hippel, Workman & Downey, 2017)

The income achievement gap in reading grows most during first five years, then remains large.

Why is *early* language development so important?

Kindergarten Vocabulary



3rd-4th Grade Reading Comprehension

(e.g., Dickinson & Tabors, 2001; Durham et al., 2007; Scarborough, 2001; Snow, Burns & Griffin, 1998; Snow, 1999; Stanovich, 1986; Storch & Whitehurst, 2001; Walker, Greenwood, Hart & Carta, 1994)

Why do we focus on the role of *family*?

Income achievement gap in reading traced back to language exposure in early years

"features" of parent input/ home language environment

Kindergarten Vocabulary

brave
Science
because Asteroid
camouflage feelings
alphabet

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Lockdowns hurt child speech and language skills - report

By Branwen Jeffreys
Education Editor

9 hours ago

Coronavirus pandemic

Pandemic babies are behind after years of stress, isolation affected brain development

Kids born in the COVID-19 era lag in certain skills and are more prone to challenging behaviors. Experts say their parents need more support.

Alia Wong USA TODAY

EducationWeek®

EARLY CHILDHOOD WHAT THE RESEARCH SAYS

Babies Are Saying Less Since the Pandemic: Why That's Concerning

By Sarah D. Sparks — April 07, 2022 5 min read

The New York Times

The Pandemic Erased Two Decades of Progress in Math and Reading

The results of a national test showed just how devastating the last two years have been for 9-year-old schoolchildren, especially the most vulnerable.


SES
Features of parent Input
Child Vocabulary

Goals

Research/Empirical Goals

- What *proximal* factors contribute to parent input?
- What features of parent input best predict vocabulary development between child ages 0-5?
  →Help understand *mechanisms* involved

Practical Goal

- Design parent-focused interventions to improve children's early vocabulary development

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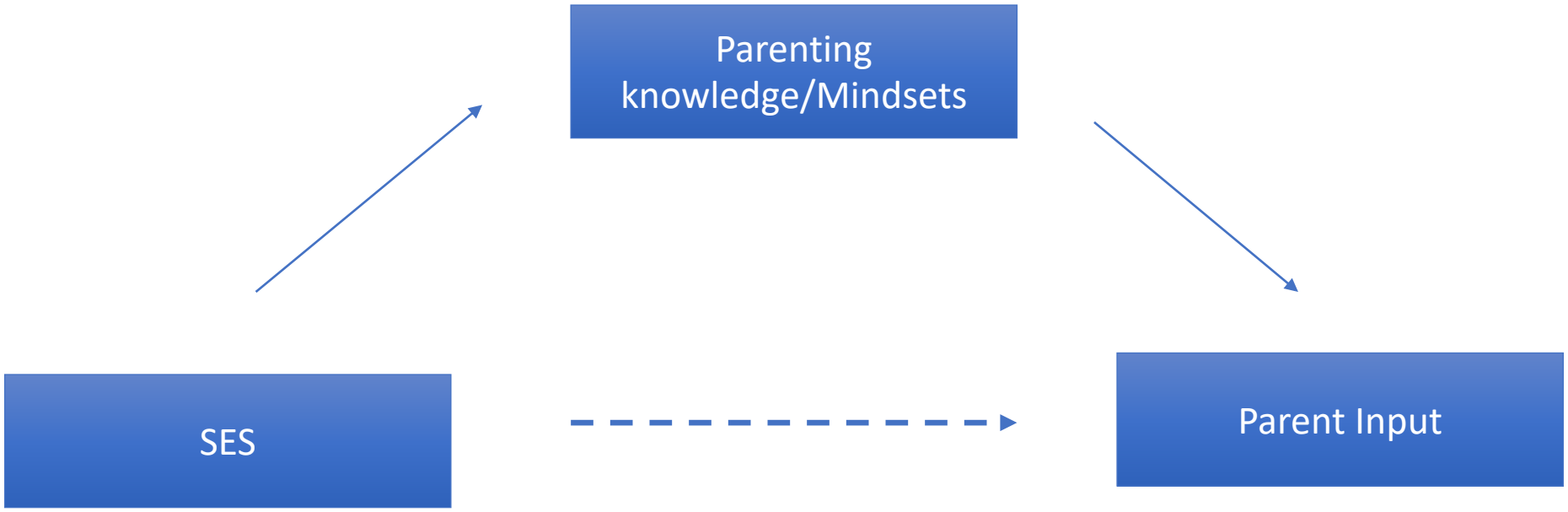
What proximal factors contribute to parent Input?

Potential malleable mechanism?

- Knowledge of child development (Rowe, 2008, Rowe et al., 2016)
- Parenting mindsets (Muenks, Miele, Ramani, Stapleton & Rowe, 2015; Mueller, Rowe & Zuckerman, 2016)



e.g., Rowe, 2008

Proximal factors: Implications for intervention

1. Provide caregivers with information/knowledge about why parent input matters for child development
2. Help caregivers understand how much of a difference they can make; help promote growth mindset towards parenting

Rowe, 2018, *Child Development Perspectives*

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Features of input that promote vocabulary

3 Dimensions of Language Environment

1. **Interactional**
2. **Linguistic**
3. **Conceptual**

(Rowe & Snow, 2020)

Features of input that promote vocabulary

0 1 2 3 4 5

Child Age

Features of input that promote vocabulary

Responsiveness, contingent talk, fluent and connected communication →
(e.g., Tamis-LeMonda et al., 2014; McGillion et al., 2017; Hirsh-Pasek et al., 2015)

↓

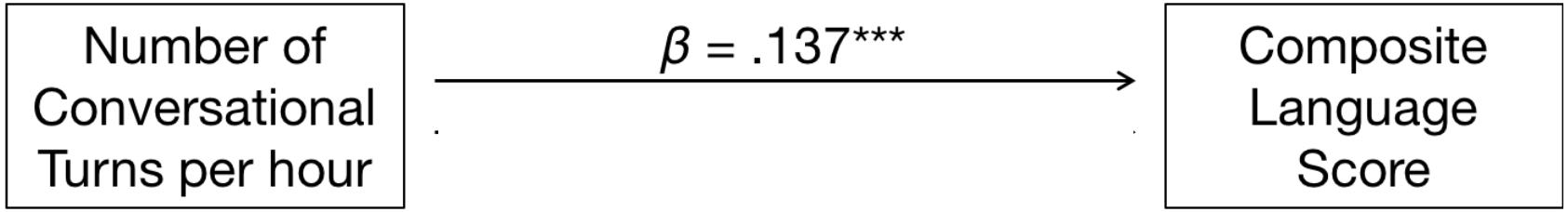
0 1 2 3 4 5

Child Age

INTERACTIONALLY SUPPORTIVE

The Power of CONVERSATIONS:

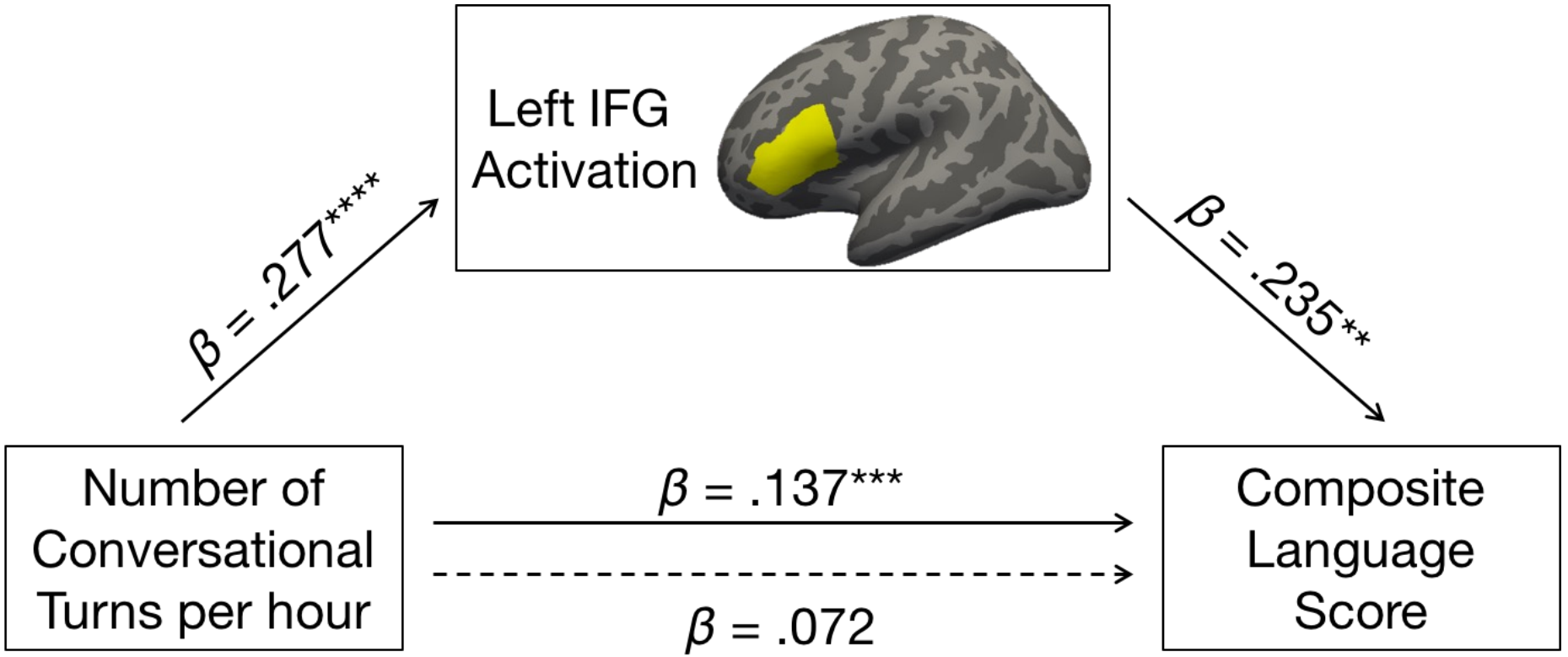
4 – 7 year olds who engage in more conversations (*not more talk*) with adults showed greater language skills



(Romeo et al., 2018 *Psychological Science*)

The Power of CONVERSATIONS:

Conversations help children process language efficiently



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IDS; Repetition of words
(e.g., Newman et al., 2015)

Ask challenging *wh*-questions
(e.g., Rowe et al., 2016)

Diversity, Sophistication of vocabulary (Weizman & Snow, 2001)

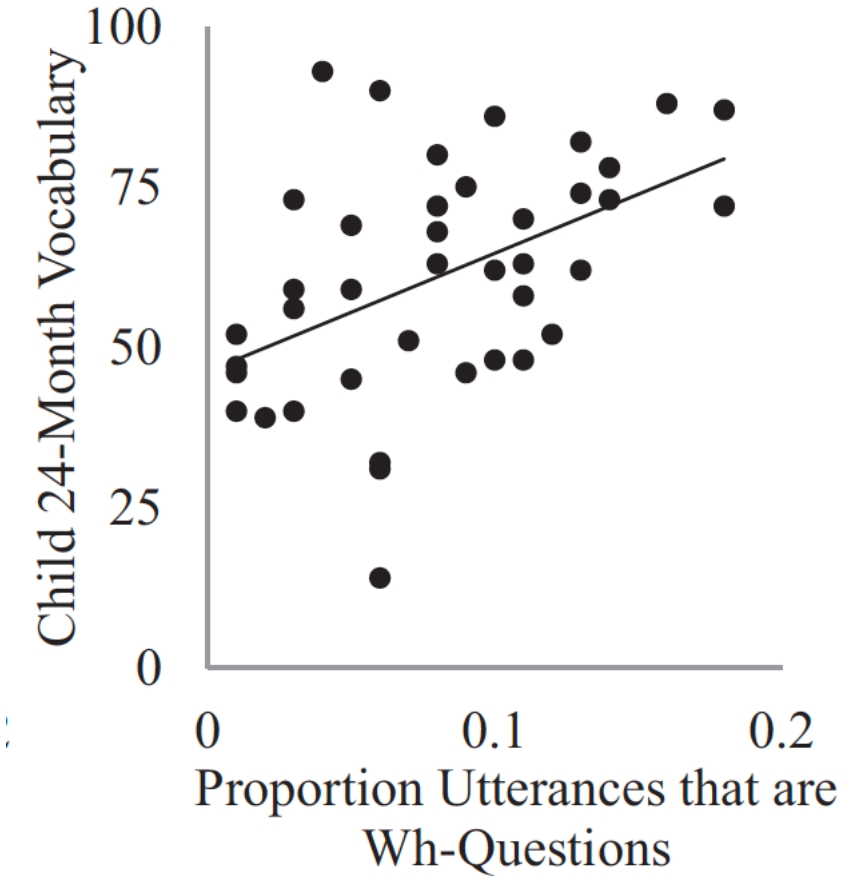
Syntactic complexity
(Huttenlocher et al., 2010; Hoff, 2003)

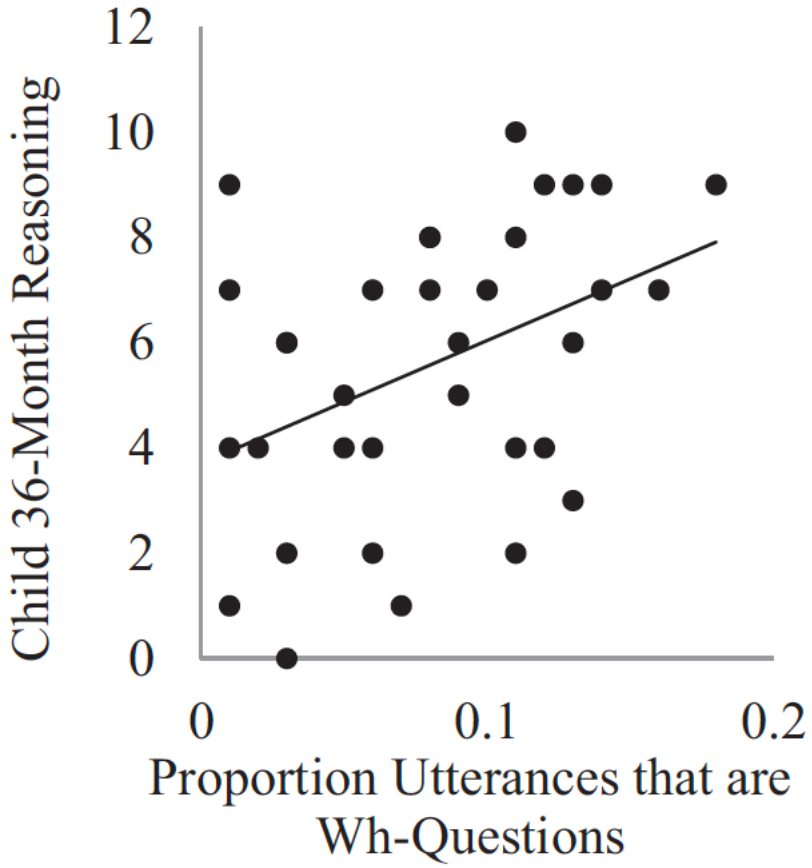
0 1 2 3 4 5

Child Age

LINGUISTICALLY ADAPTIVE

Fathers' use of wh-questions with toddlers relates to vocabulary and predicts verbal reasoning





(Rowe, Leech & Cabrera, 2017)

Teacher use of complex syntax in preschool classrooms

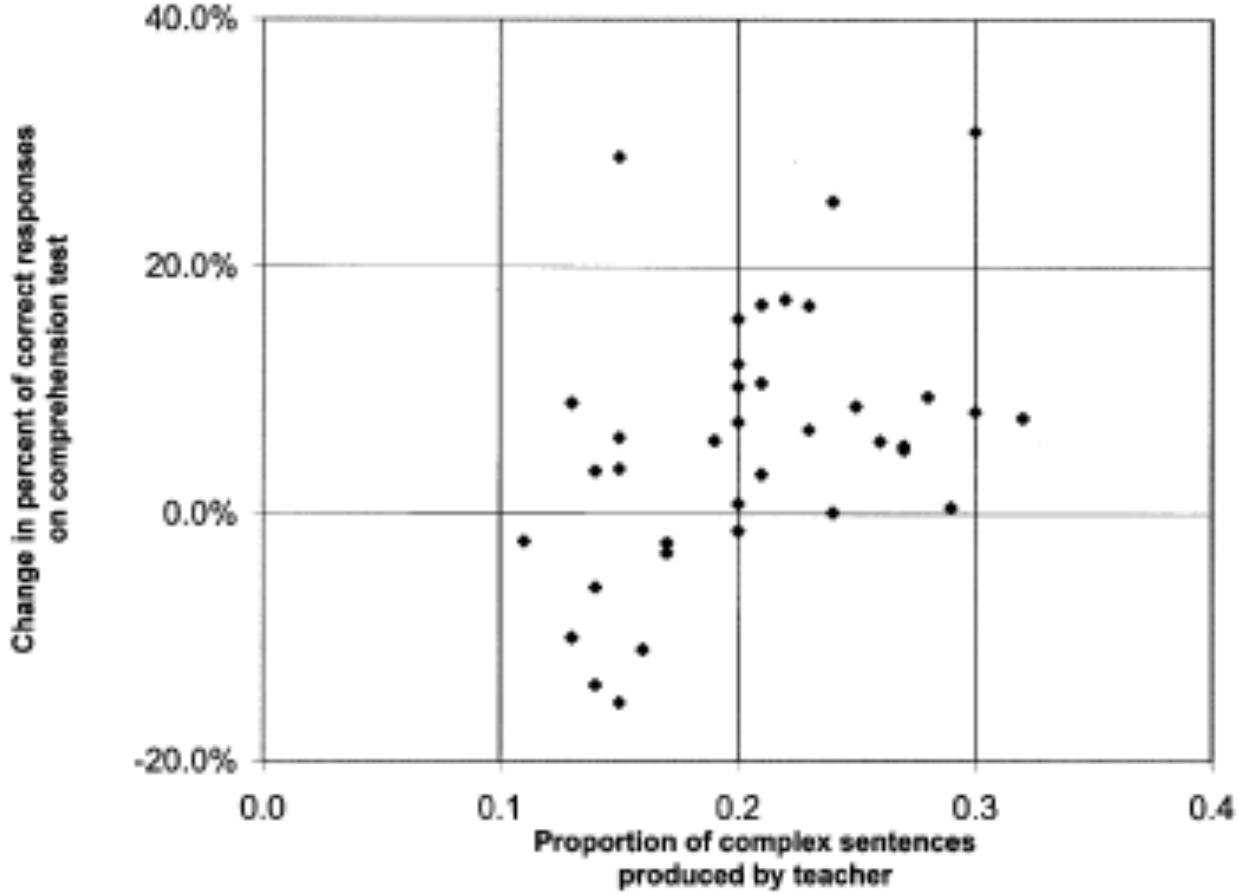


Fig. 8. The relation of the proportion of complex sentences in teacher speech to comprehension scores, Study 2.

Teachers who use more complex sentences have preschoolers who make greater gains in grammar over the course of the year

Huttenlocher et al., 2002

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Gesture; Here & Now
(e.g., Rowe & Goldin-Meadow, 2009)

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CONCEPTUALLY CHALLENGING

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Child Age

CONCEPTUALLY CHALLENGING

Infants' first gestures:

Deictic

- Indicate reference to objects, people, locations; showing, giving, pointing

SHOW & GIVE

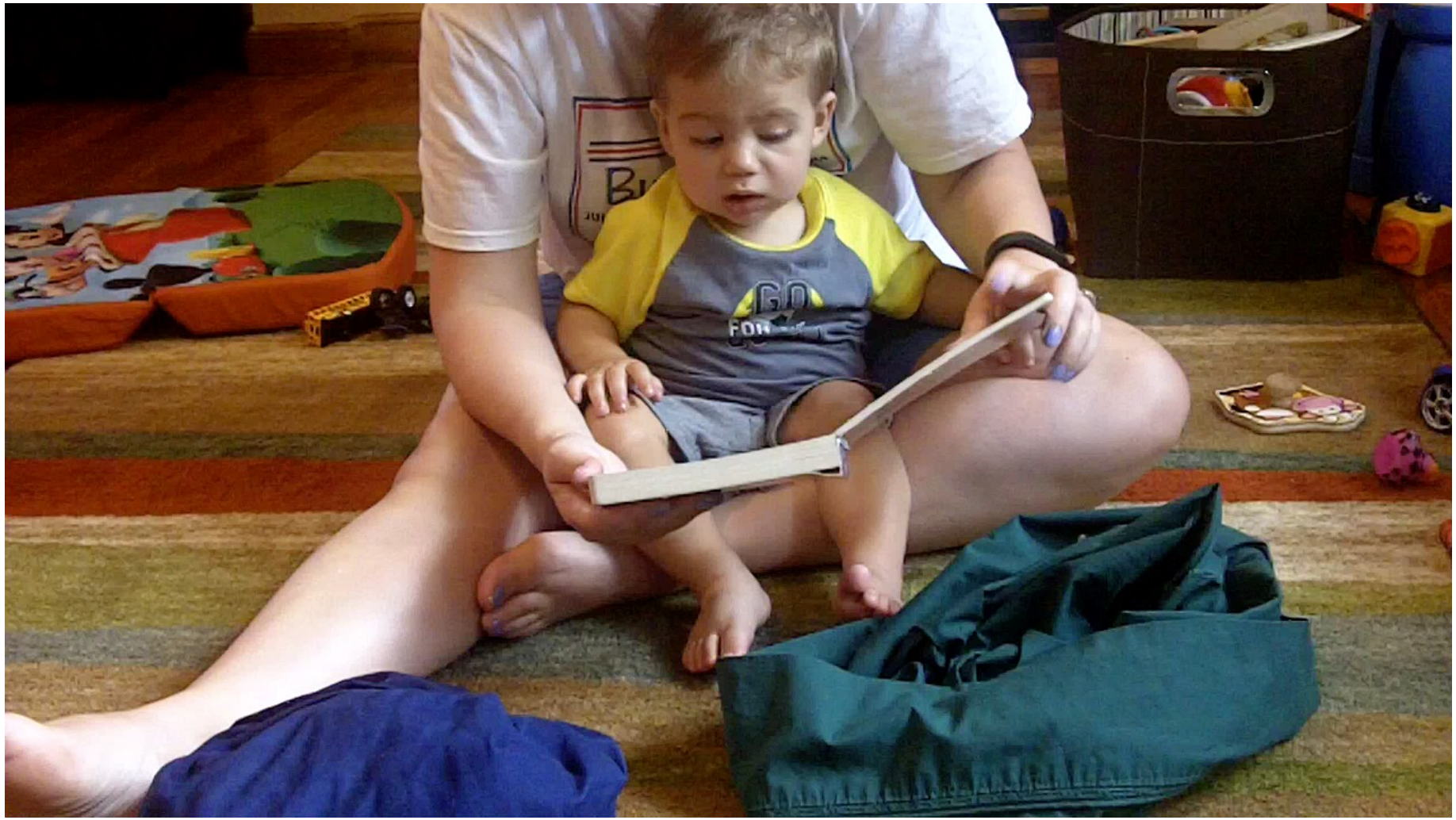
POINT

Conventional

- Nodding, waving, etc

(e.g., Bates, Camaioni, and Volterra, 1975)

Features of Input:
Gesture

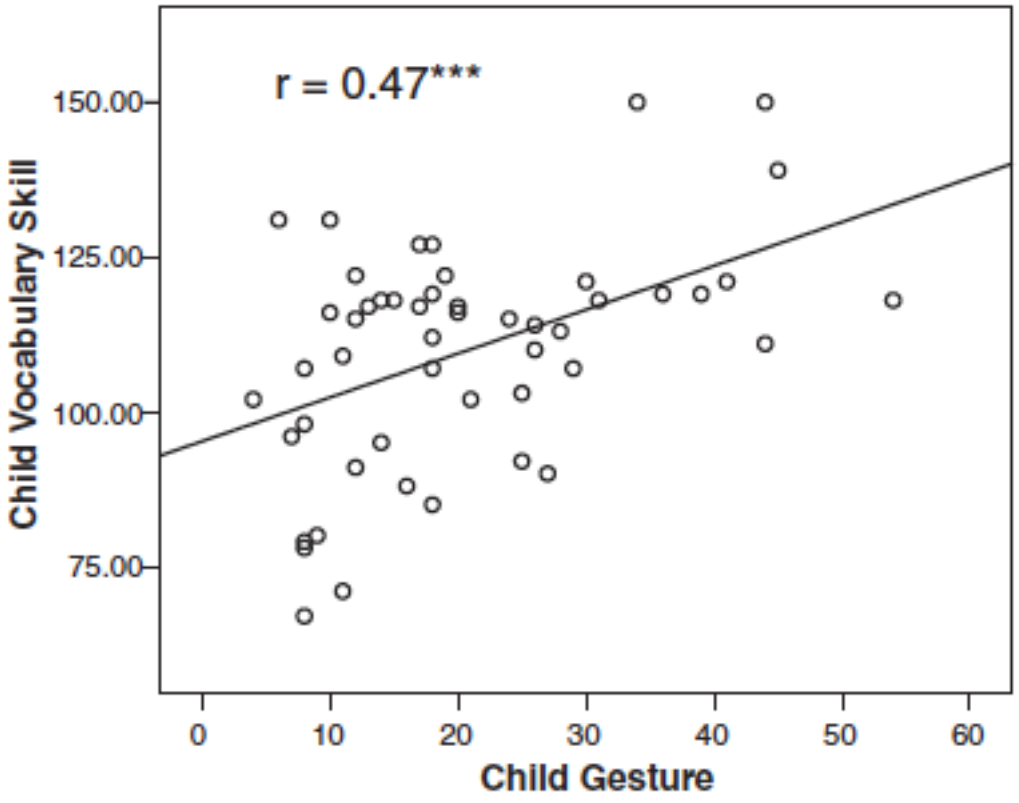


Gesture: Methodological approach

*MOT: what's a lion say?
%gpx: points to picture of lion in book
%gcd: $D:FPoint#p_lion|RE
*CHI: rawr@o.
*MOT: yeah.
*MOT: rawr@o.
*CHI: 0@b.
%gpx: points to picture of gorilla
%gcd: $D:FPoint#p_gorilla|GV
*MOT: yeah that's the gorilla.
*MOT: he's letting the lion out of the cage.
%act: turns page
*MOT: +" good_night hyena.
*MOT: +" good_night giraffe.
*CHI: 0@b.
%gpx: points to the hyena
%gcd: $D:FPoint#p_hyena|GV
*MOT: yeah is that like a doggy?
*MOT: it's like a doggy.
*MOT: you love doggies.

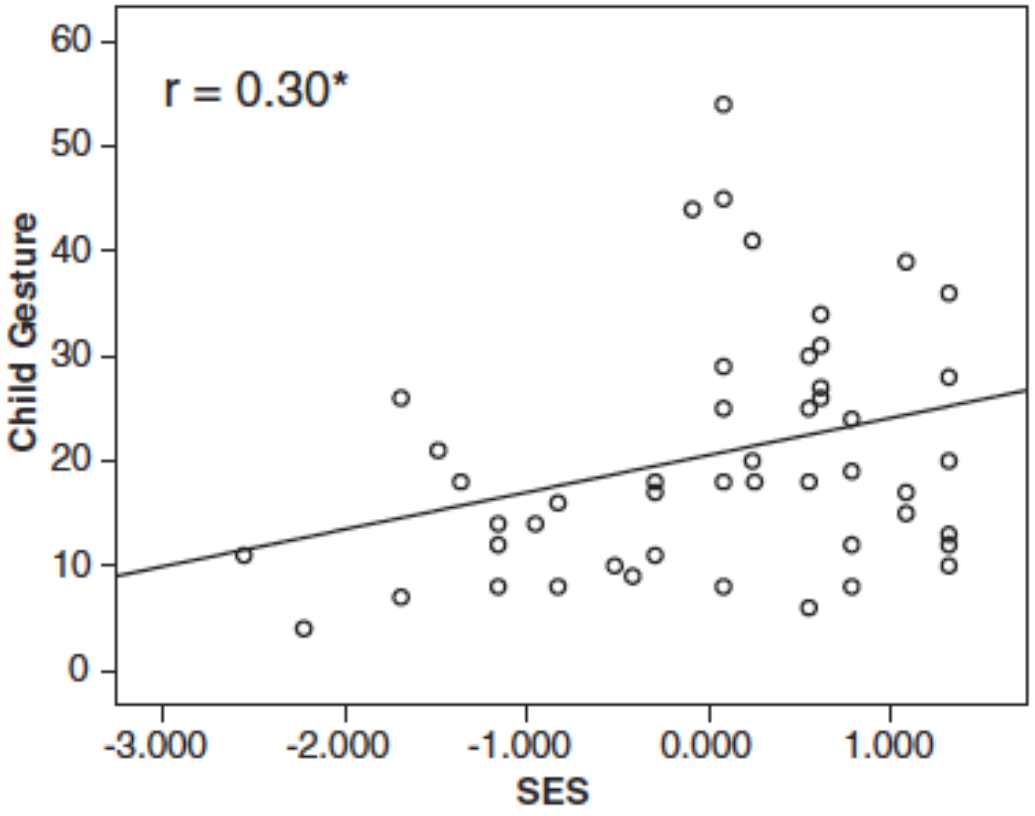
Gesture: Skills build upon skills

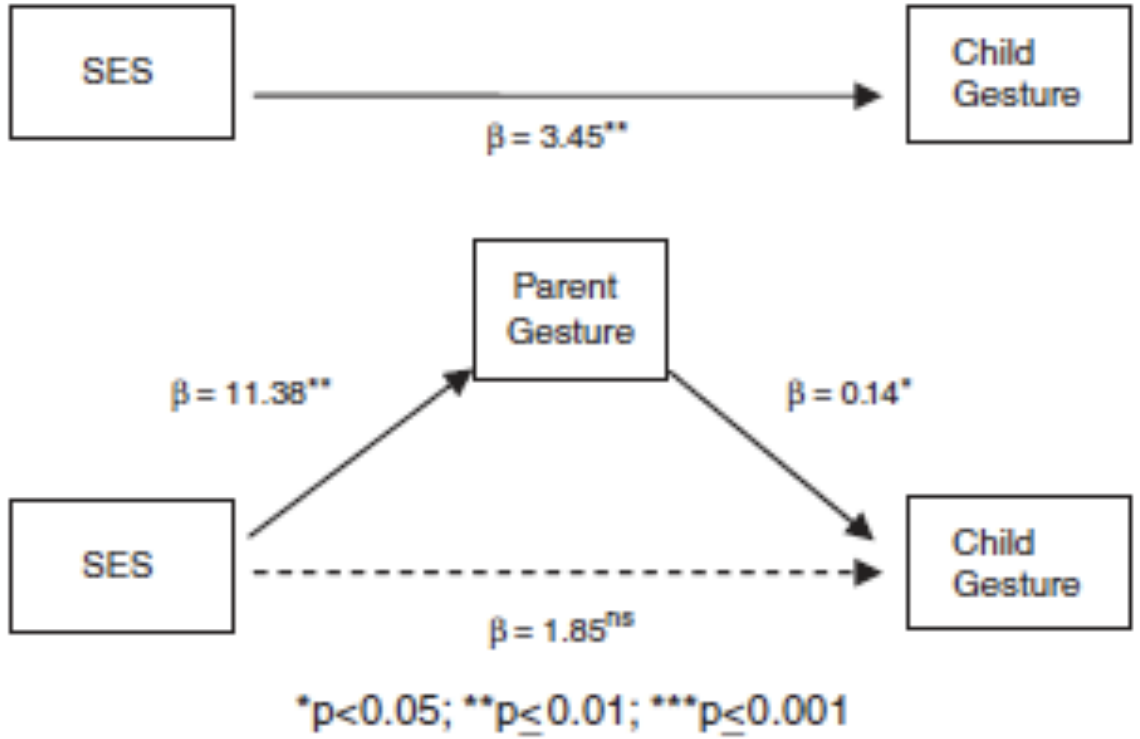
Variability in early gesture use predicts variability in later vocabulary skill (PPVT age 5)



N=50
Rowe & Goldin-Meadow, 2009

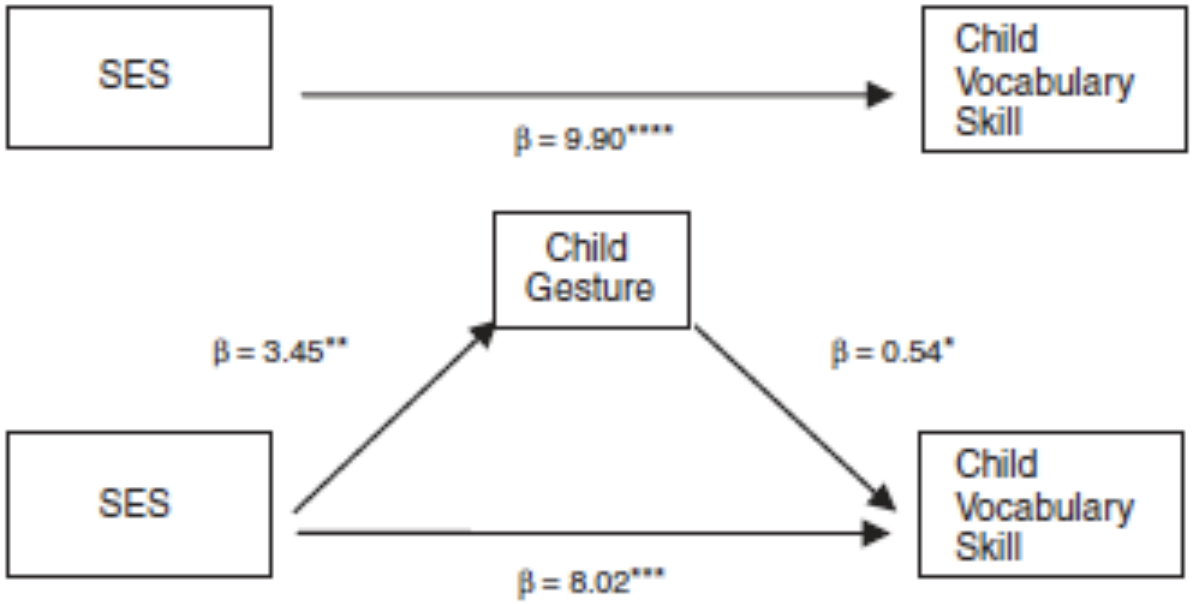
Gesture: Parent Gesture Predicts Child Gesture





Rowe & Goldin-Meadow, 2009

Gesture: SES differences predict later vocabulary

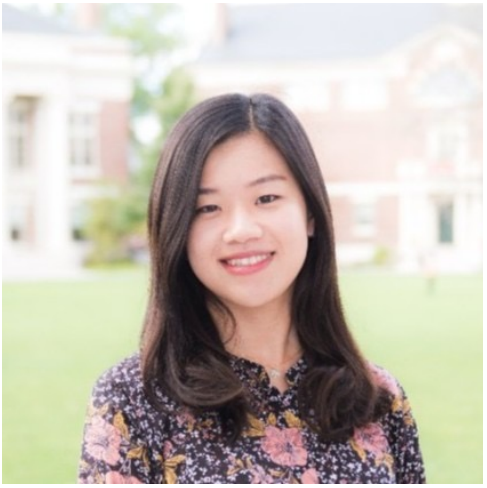


Rowe & Goldin-Meadow, 2009

Gesture predicts vocabulary across cultures

Case of South Korea:

- 31 infants (14-months); mother-child interaction coded for gestures.
- 36-months language assessments (receptive and expressive)



(Shin, Rowe & Lee, In press)

Table 4.
A Series of Multiple Regression Models Predicting Children's Receptive Vocabulary Scores at 36 Months from Mothers and Children's Gesture Types, Demographic Variables, Children's Baseline Vocabulary Scores, Mothers' Linguistic Measures at 14 Months.

	Receptive Vocabulary Score at 36 Months				
14-month Measures	Model 1	Model 2	Model 3	Model 4	Model 5
Female	6.131	5.592	2.055	1.464	1.037
Age	-2.160	-2.405	-3.565*	-4.134*	-3.723*
Baseline Receptive Vocab.	0.276	0.251	0.157	0.158	0.163
Maternal Gesture Type		0.417	0.063	-0.147	-0.067
Child Gesture Type			1.207*	1.226*	1.235*
Maternal Utterance				0.057	
Maternal MLU					3.147
Intercept	44.28	42.68	61.37*	61.45*	54.88*
R^2	0.233	0.266	0.424	0. 464	0.441
df	27	26	25	24	24
F	2.737	2.355	3.679	3.458	3.158

Gesture predicts vocabulary for children at higher likelihood for Autism

- N=89 infants total, 55 Infant siblings of children with ASD
- Gesture use at 12-months during parent-child interaction
- Language assessment (MSSEL) at 24-months: Receptive Vocabulary

	Model 1	Model 2	Model 3	Model 4
Intercept	53.47*** (1.80)	53.73*** (1.79)	56.61*** (2.10)	35.88** (12.04)
Gestures at 12 months	0.30* (0.14)	0.39* (0.15)	0.39* (0.15)	0.29* (0.14)
Word types at 12 months		−1.44 (0.91)	−1.36 (0.88)	−1.17 (0.84)
Risk status			−5.12* (2.13)	−4.30~ (2.31)
Nonverbal cognition				0.15 (0.09)
Sex				−2.63 (2.24)
Caregiver education				0.76 (0.74)
N	65	65	65	58
R^2 statistic (%)	6.6%	10.2%	18.0%	24.8%

Note Nonverbal cognition was measured using Nonverbal Developmental Quotient from Mullen Scales of Early Learning (MSEL) at 12 months. Risk status was coded as LRC = 0, HRA = 1. Sex was coded as female = 1, male = 0. Data are reported as regression coefficients with standard errors in parentheses

~$p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

(Choi, Shah, Rowe, Nelson & Tager-Flusberg, 2019)

Gesture: Boosting early skills may reduce gaps

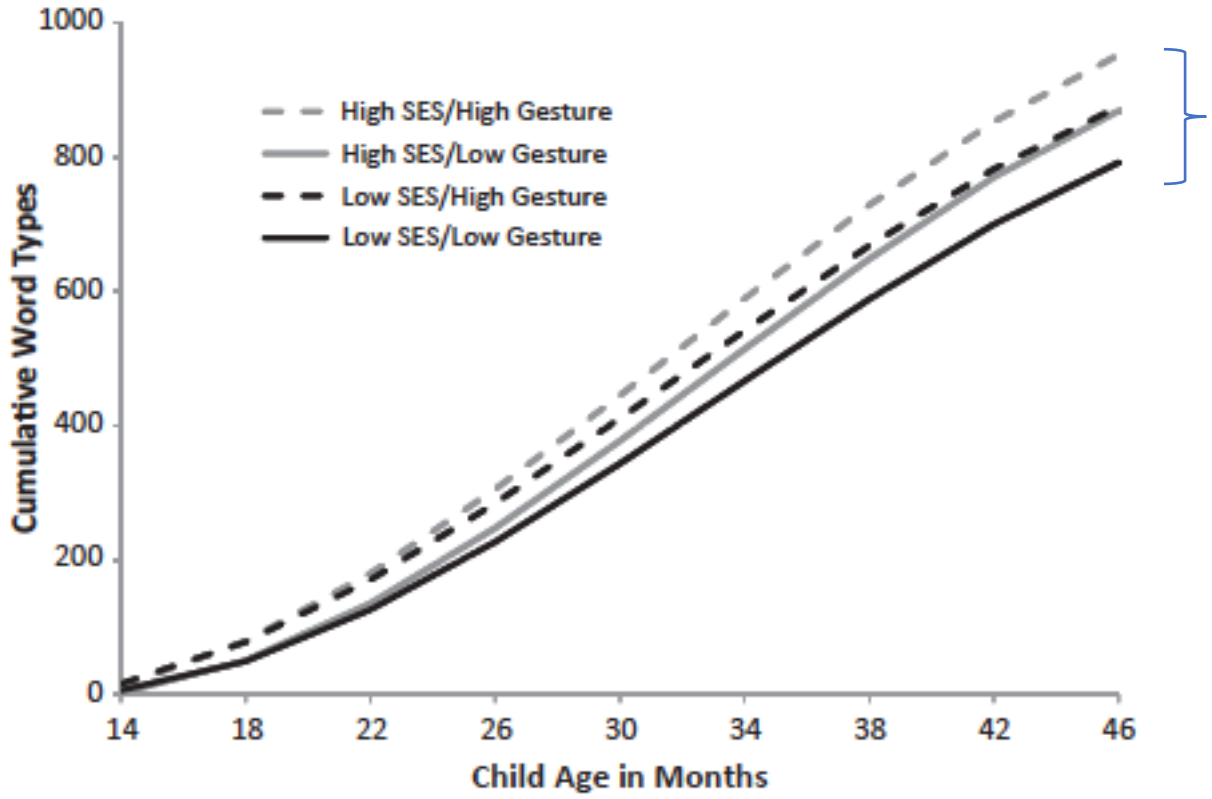


Figure 2. Effect of socioeconomic status (SES) and child gesture on cumulative vocabulary growth, holding parent input constant

SES gap is reduced if child from low-SES family is High gesturer

Rowe, Raudenbush & Goldin Meadow, 2012

Gesture: Mechanisms

Children learn to talk through social interactions with others (e.g., Bruner, 1981, Kuhl, 2007, Snow, 1999, Vygotsky, 1978)

→emergence and use of pointing may also be *socially mediated*

→Children see parents point and do so themselves

Parents also "translate" their children's gestures into words (e.g., Goldin-Meadow et al., 2007)

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Practical Goal

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SES → Features of parent Input → Child Vocabulary

Gesture: Parent Intervention

Pointing to Success Training

POINTING to SUCCESS©

Parenting knowledge/Mindsets

Parent gesture → Child gesture → Child vocabulary Growth

NICHD: R21HD078771

Gesture: Parent Intervention

50 families recruited to our study on “Play and Development”

Initial Home Visit (10-months)

- Baseline parent and child interaction (15 mins)
- Parent questionnaires (Child Vocabulary, Parent Knowledge, Mindset)
- Random Assignment - Intervention/Training implementation
  - **5 minute video = *Pointing to Success***
  - **Focus on providing parents with knowledge and supporting growth mindset**
- Give families toys to play with – txt families in intervention group once week

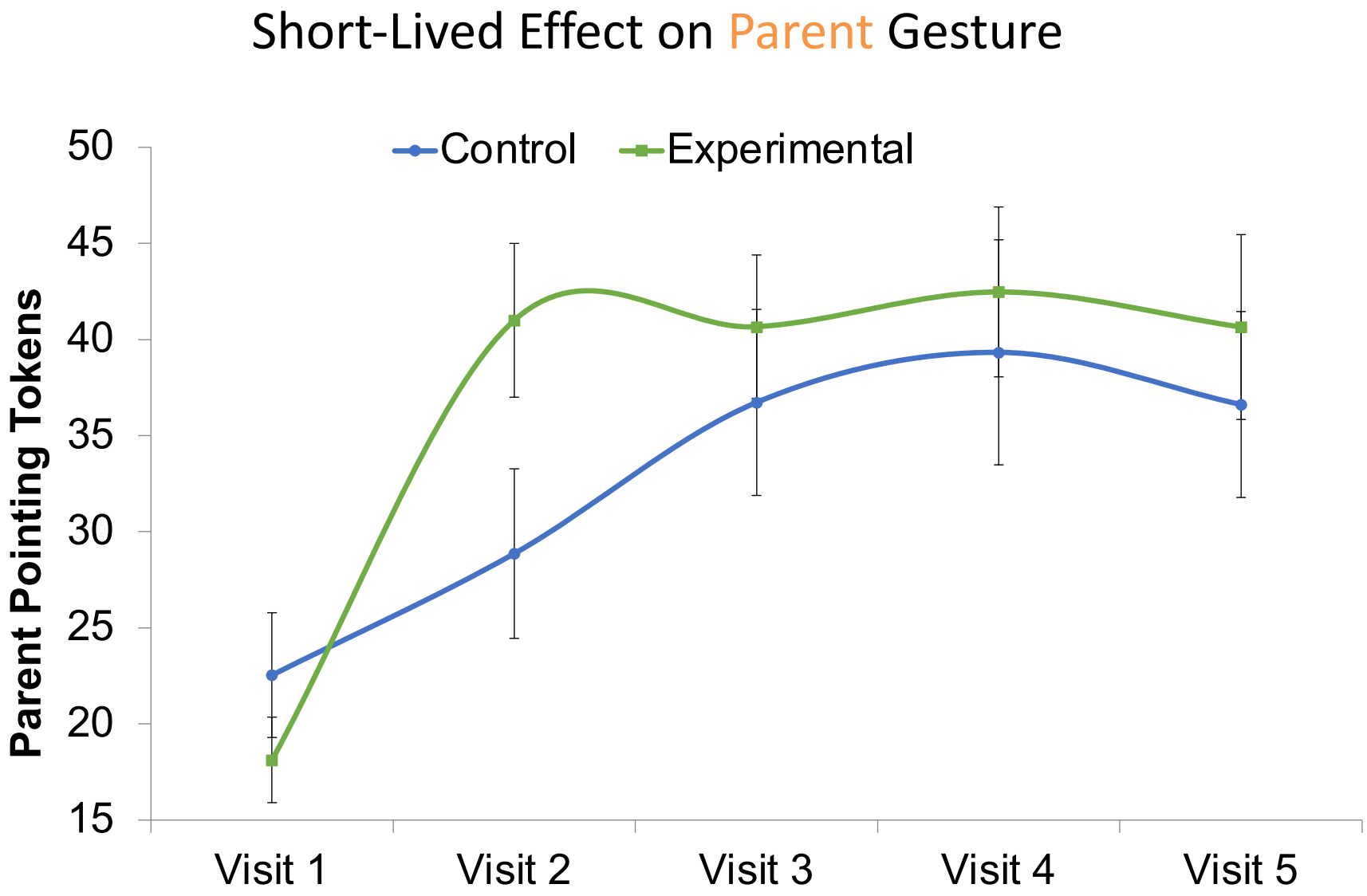
- Additional home visits (child ages 12, 14, 16, 18 months)
  - Recorded parent-child interactions 15 mins
  - Vocabulary

SES → Features of parent Input → Child Vocabulary

Gesture: Parent Intervention

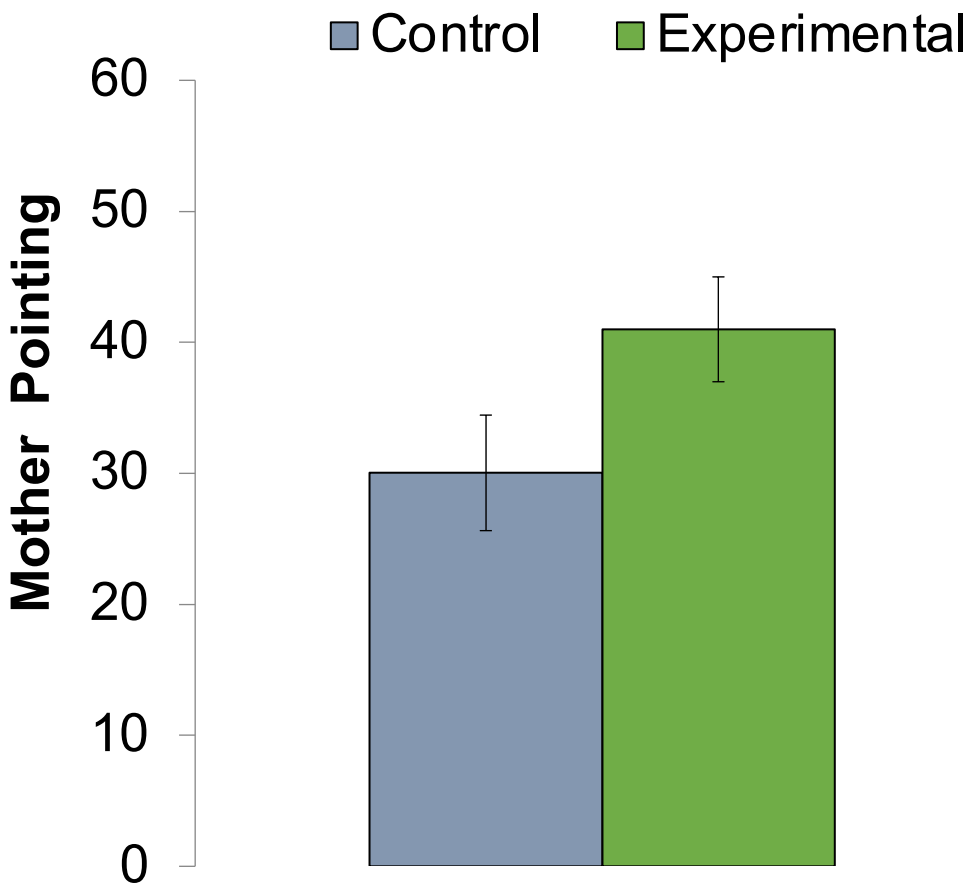
Is there an effect of the intervention on parent and child pointing?

Gesture: Parent Intervention



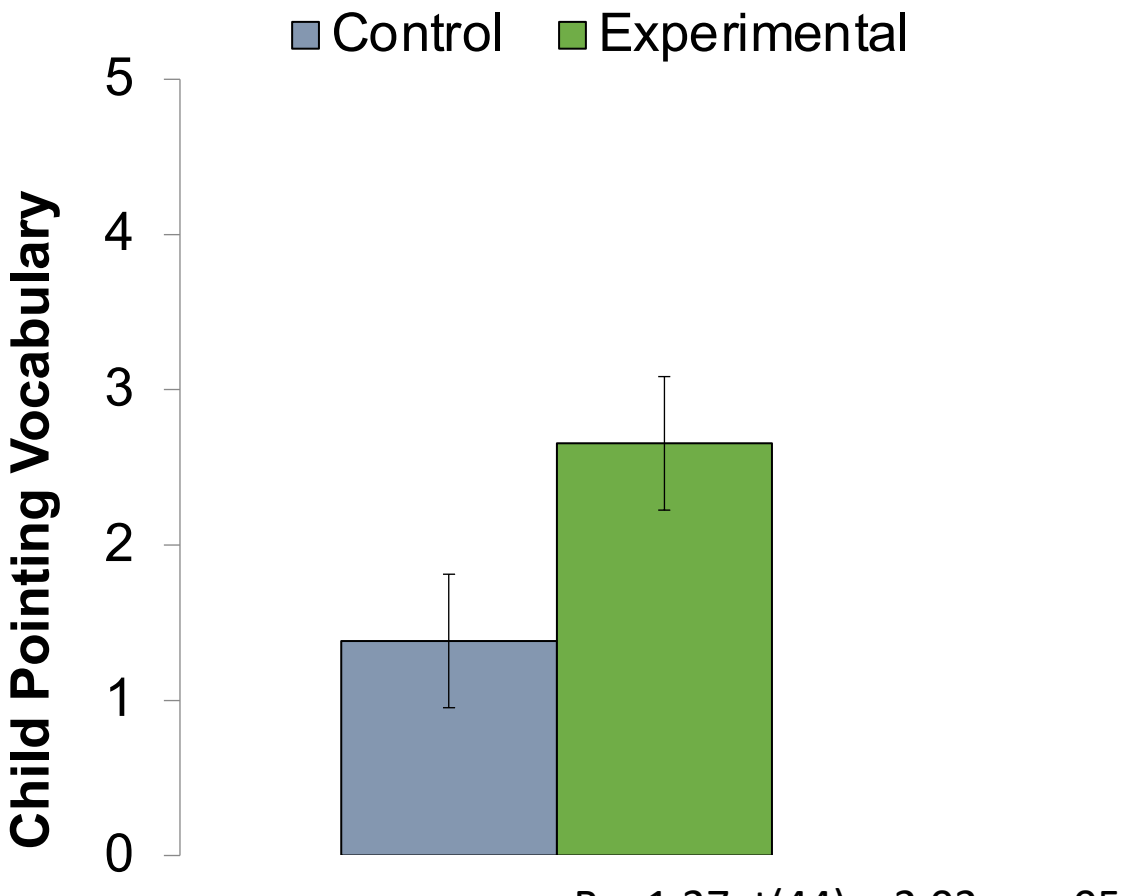
Gesture: Parent Intervention

Parent



B = 13.246, t(44) = 2.31, *p* =.026

Child



B = 1.27, t(44) = 2.02, *p* =.05

Rowe & Leech, 2019

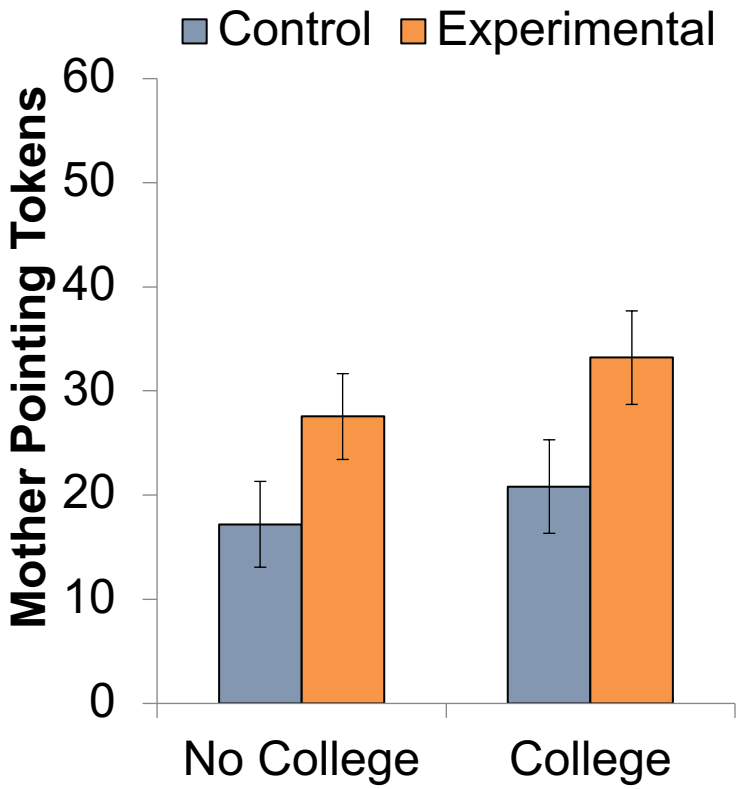
Gesture: Parent Intervention

Possible Moderators of Intervention Effectiveness

- Maternal Education
- Knowledge of child language development
- Parent mindsets

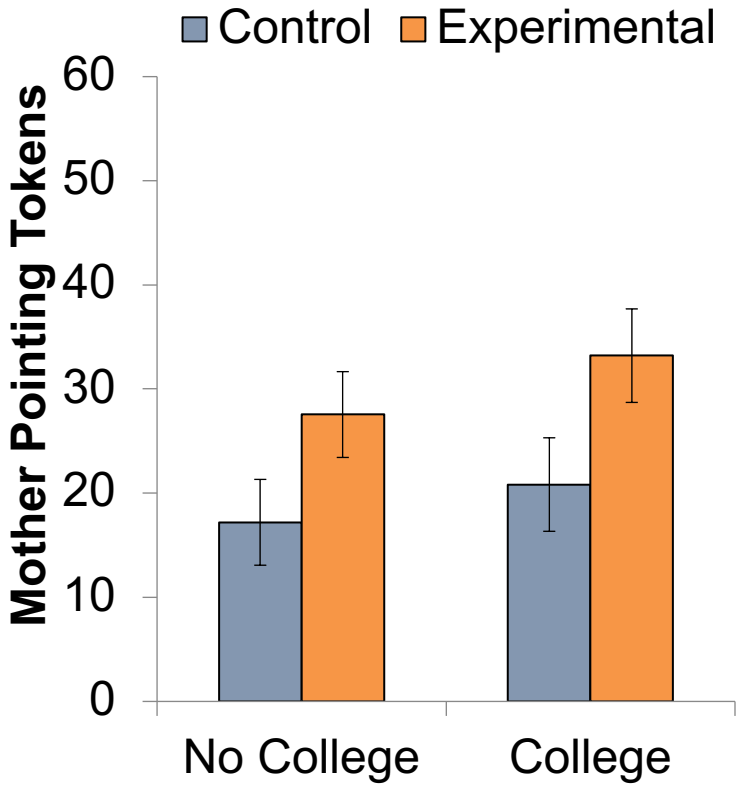
Gesture: Parent Intervention

No moderating effect of parent education



Gesture: Parent Intervention

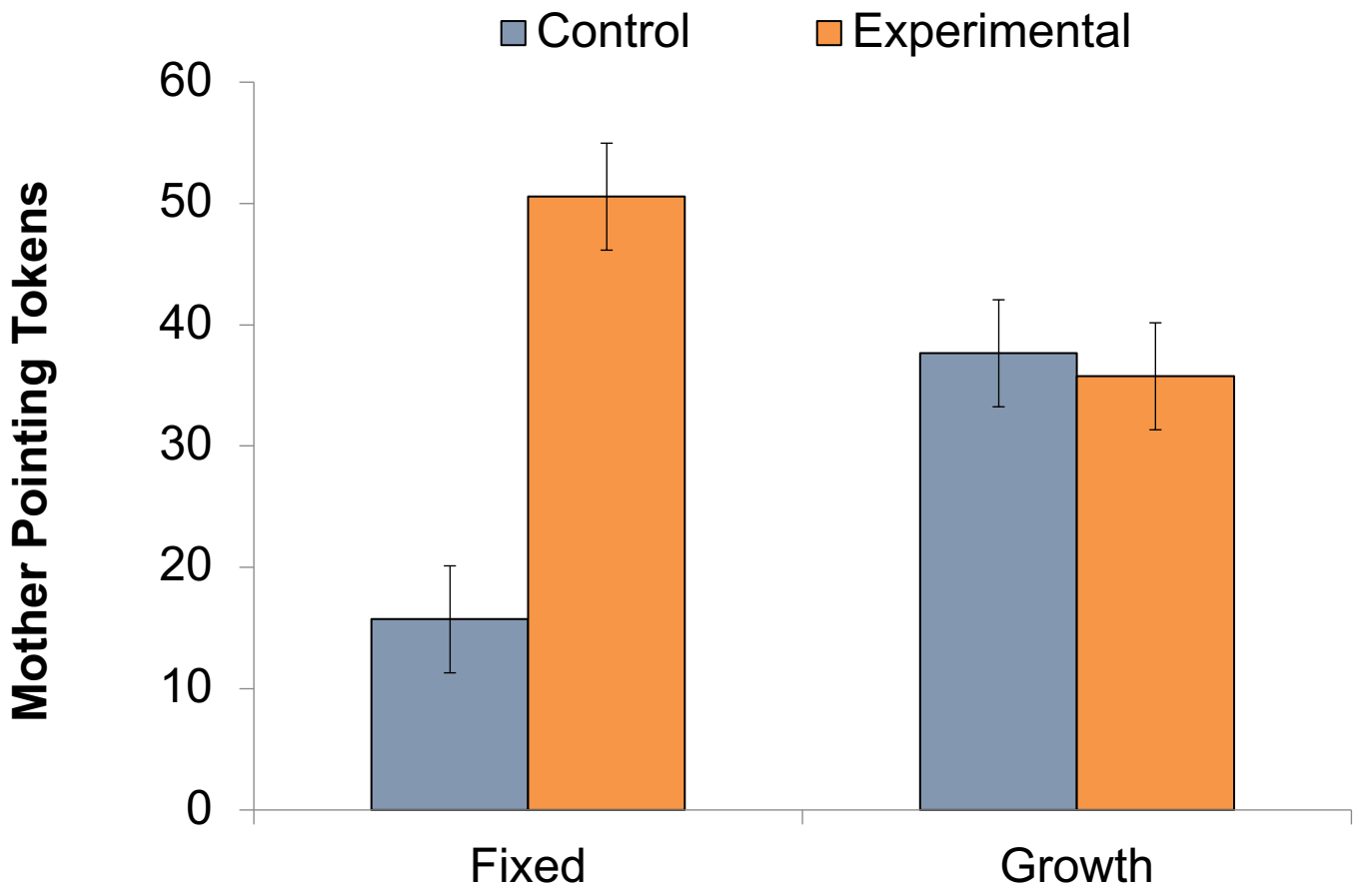
No moderating effect of parent education



Also, no moderating effect of parent knowledge of child development

Rowe & Leech, 2019

Gesture: Parent Intervention

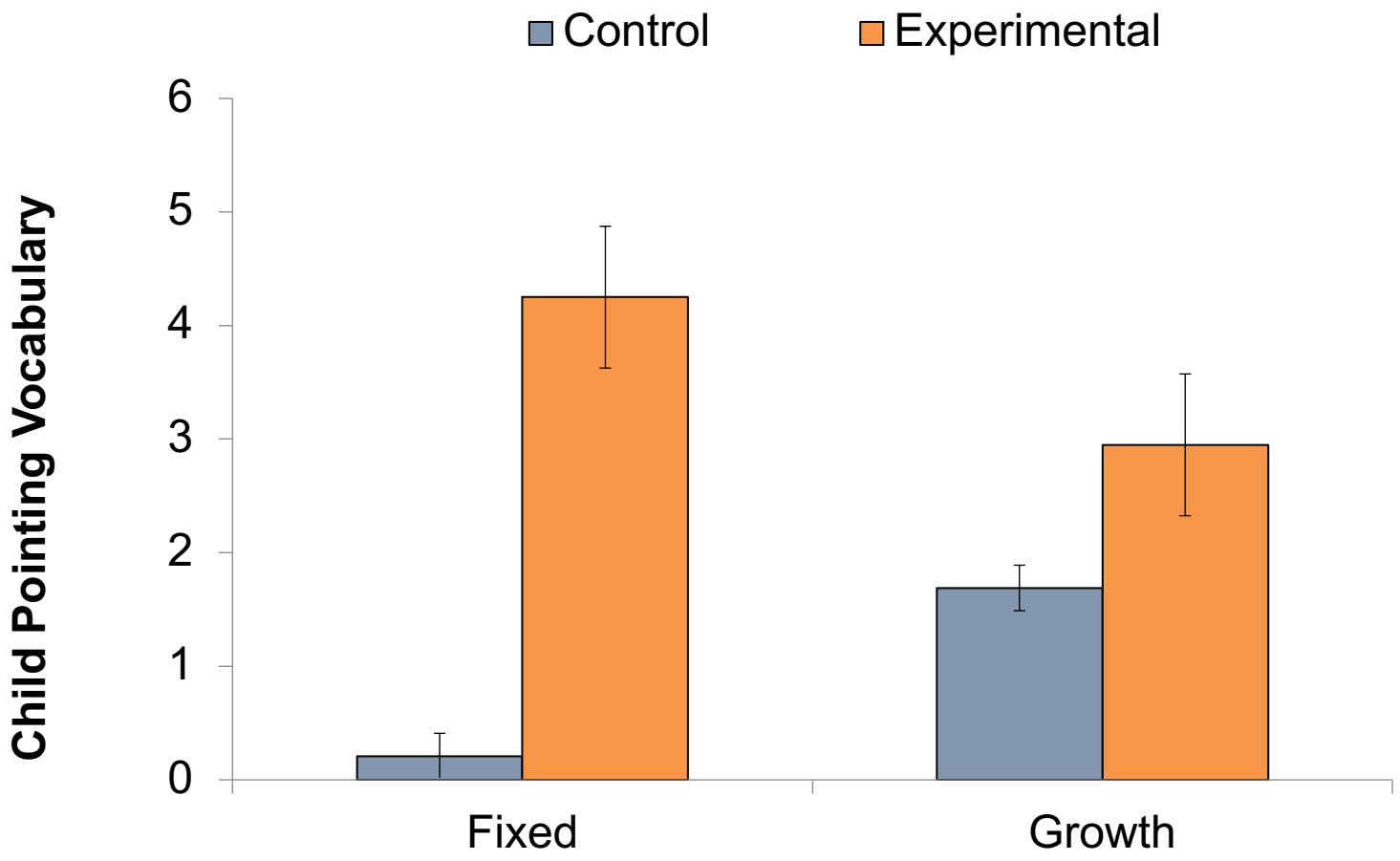


Gesture intervention had a stronger effect for parents who endorsed *fixed* mindsets at baseline

Rowe & Leech, 2019

Mindset x Condition Interaction: B = 11.82, t(42) = 2.17, *p* =.037

Gesture: Parent Intervention



Intervention has a larger effect on child gesture for children of parents who endorsed fixed mindsets at baseline

Mindset x Condition Interaction: B = 1.21, t(42) = 2.03, *p* =.04

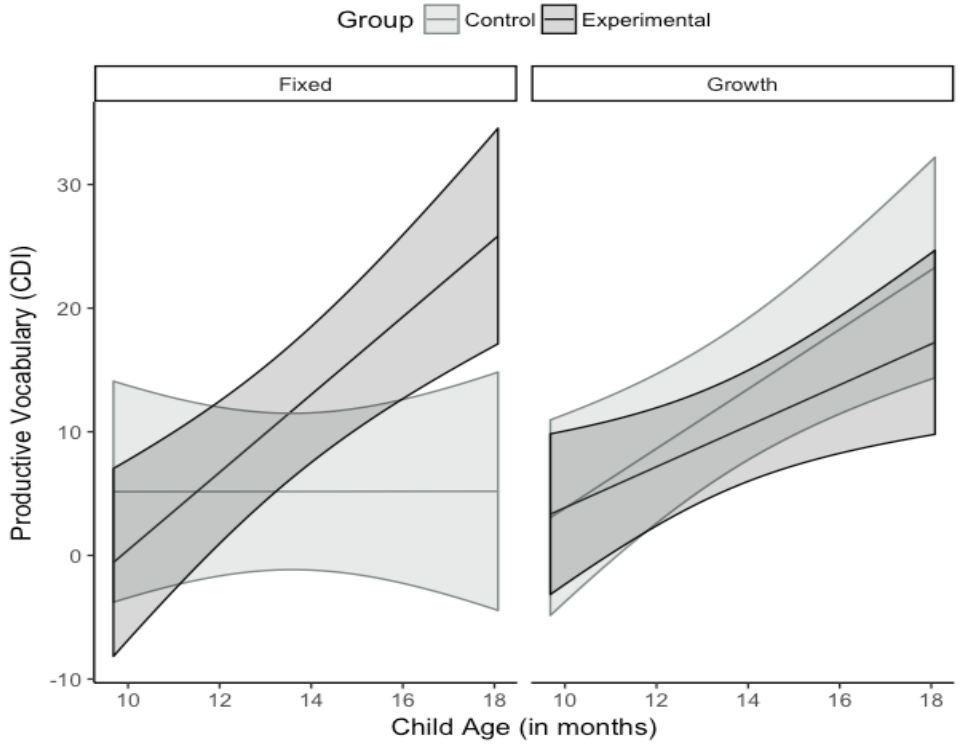
Rowe & Leech, 2019

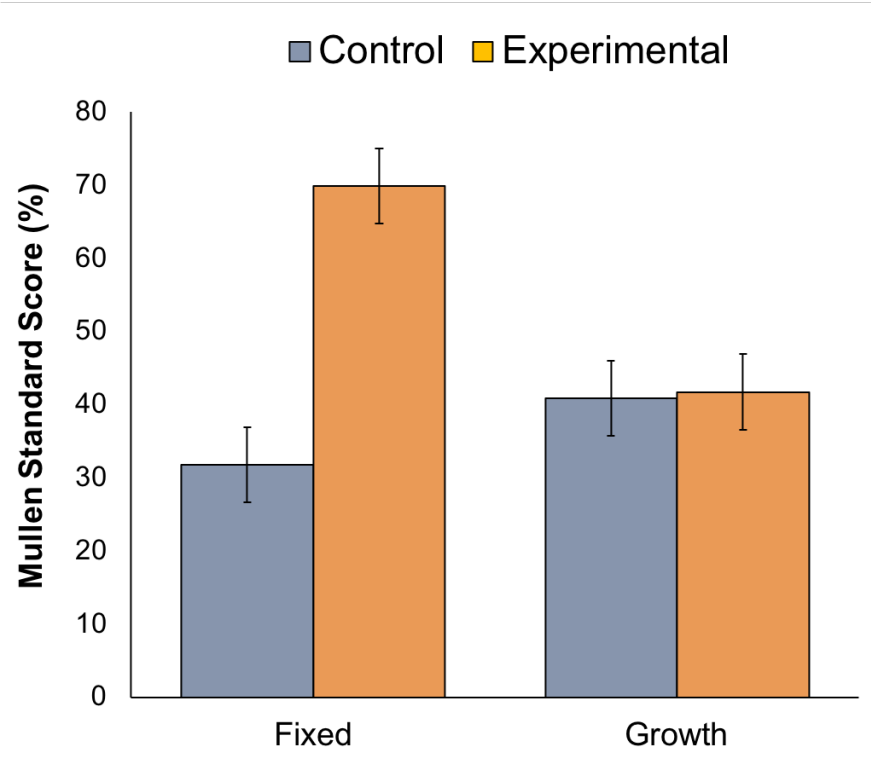
SES → Features of parent Input → Child Vocabulary

Gesture: Parent Intervention

Is there an effect of the intervention on child vocabulary?

Gesture: Parent Intervention





Children of parents who endorsed fixed mindsets at baseline and were in the intervention group had faster vocabulary growth (CDI), and higher scores on Mullen expressive language scales at 18-months (Rowe & Leech, 2019)

Gesture: Parent Intervention

Conclusions

- The Pointing to Success intervention resulted in short-term effects on parent and child gesture
  → Provides evidence for *social-mediation* theory/hypothesis

- The intervention was most effective for families where parents had more “fixed” mindsets at baseline, regardless of SES.

- Results highlight the importance of understanding what types of interventions might work for whom and why.

Features of input that promote vocabulary

Responsiveness, contingent talk, fluent and connected communication
(e.g., Tamis-LeMonda et al., 2014; McGillion et al., 2017; Hirsh-Pasek et al., 2015)

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Gesture; Here & Now
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Decontextualized talk and explanations
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Syntactic complexity
(Huttenlocher et al., 2010; Hoff, 2003)

0 1 2 3 4 5

Child Age

CONCEPTUALLY CHALLENGING

Features of Input: Decontextualized Talk

SES → Features of parent Input → Child Vocabulary

- Language that is removed from the here and now (Snow, 1990)
- Typically seen in parent-child conversations:
  - Causal explanations
  - Narrative utterances (past or future)
  - Pretense
- Relatively rare, but increases over early childhood (Rowe, 2012)
- More frequent during mealtimes (Aukrust & Snow, 1998; Beals & DeTemple, 1993)
- Remaining talk is contextualized
  - Grounded in “here-and-now”

Decontextualized Talk: Examples

Contextualized Talk

28 *CHI: I want more rice than Lizzie.
29 *MOT: you want more rice than Lizzie?
30 *CHI: is this white rice?
31 *MOT: yea it's like cheesy rice kind of.
32 *CHI: is it white?
33 *MOT: uh yea it's white.
35 *CHI: yay white rice.
36 *MOT: you have white rice?
37 *CHI: white rice.
38 *MOT: it's actually called couscous.

Decontextualized Talk

133 *MOT: yes so tomorrow daddy says if you sleep and don't wake anyone up in the morning.
138 *MOT: he'll take you out to breakfast.
140 *CHI: oh!
141 *MOT: the only tricky part about that is mommy has to go for a really long
142 run tomorrow morning.
146 *CHI: why do you have to?
148 *MOT: because I'm gonna do that race with xxxx and xxxx in a few weeks.
150 *CHI: hmm?
152 *MOT: I'm gonna run really far.
154 *CHI: where are you having it?
156 *MOT: where is the race?
158 *CHI: yea.
160 *MOT: it's in New Hampshire.
163 *MOT: it's a race that mommy does +/.
165 *CHI: am I gonna be there too cheering you?
167 *CHI: am I coming there cheering on?
169 *MOT: yep you're gonna come cheer.

Decontextualized Talk: Our Findings/Mechanisms

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- Child decontextualized talk in preschool predicts 7th grade academic language skills, controlling for SES, parent decontextualized talk, and early child vocabulary skill (Uccelli, Demir, Rowe, Levine & Goldin-Meadow, 2019)

Goals

Research/Empirical Goals

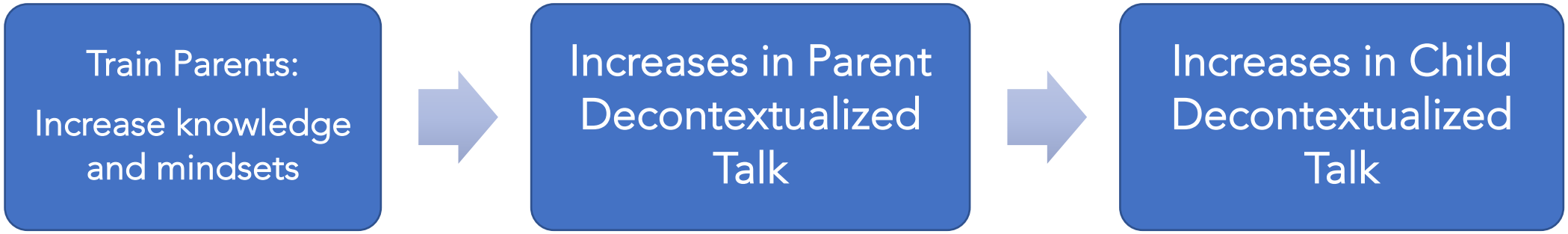
- What *proximal* factors contribute to parent input?
- What features of parent input best predict vocabulary development between child ages 0-5?
  →Help understand *mechanisms* involved

Practical Goal

- Design parent-focused interventions to improve children's early vocabulary development

Decontextualized Talk: Parent Intervention

R.E.A.D.Y. Talk – a decontextualized language training for parents of 4 year olds to increase children's exposure to and use of abstract talk



Leech, Wei, Harring & Rowe, 2018, *Developmental Psychology*

Decontextualized Talk:
Parent Intervention

SES → Features of parent Input → Child Vocabulary

Kathryn Leech

Leech, Wei, Harring & Rowe, 2018, *Developmental Psychology*

Decontextualized Talk: Parent Intervention

- 36 parent-child dyads recruited for ”family mealtime study”
  - Four year old children; mid-high SES sample

- Visit to laboratory
  - Snack time - Baseline measure of parent and child decontextualized talk
  - Random assignment: Training implementation
    - **15 minute video = *R.E.A.D.Y***
    - **Focus on providing parents with knowledge and supporting growth mindset**

- Four measurements of parent-child conversations
  - Recorded at home during mealtimes
  - Corpus of 174 recordings nested within 36 dyads

Leech, Wei, Harring & Rowe, 2018, *Developmental Psychology*

Decontextualized Talk: Parent Intervention

R.E.A.D.Y. Category	Example
PAST EVENTS	• You gave that shirt to me last Fathers' Day.
EXPLANATIONS	• She can't have chocolate because she's a little baby.
FUTURE EVENTS	• I wonder who the parent helper's gonna be today at school.
QUESTIONS:	• And then what did we do with the stuffed animals? • Why you gonna have lunch with Candace?

Composited to yield total number of decontextualized utterances

Leech, Wei, Harring & Rowe, 2018, *Developmental Psychology*

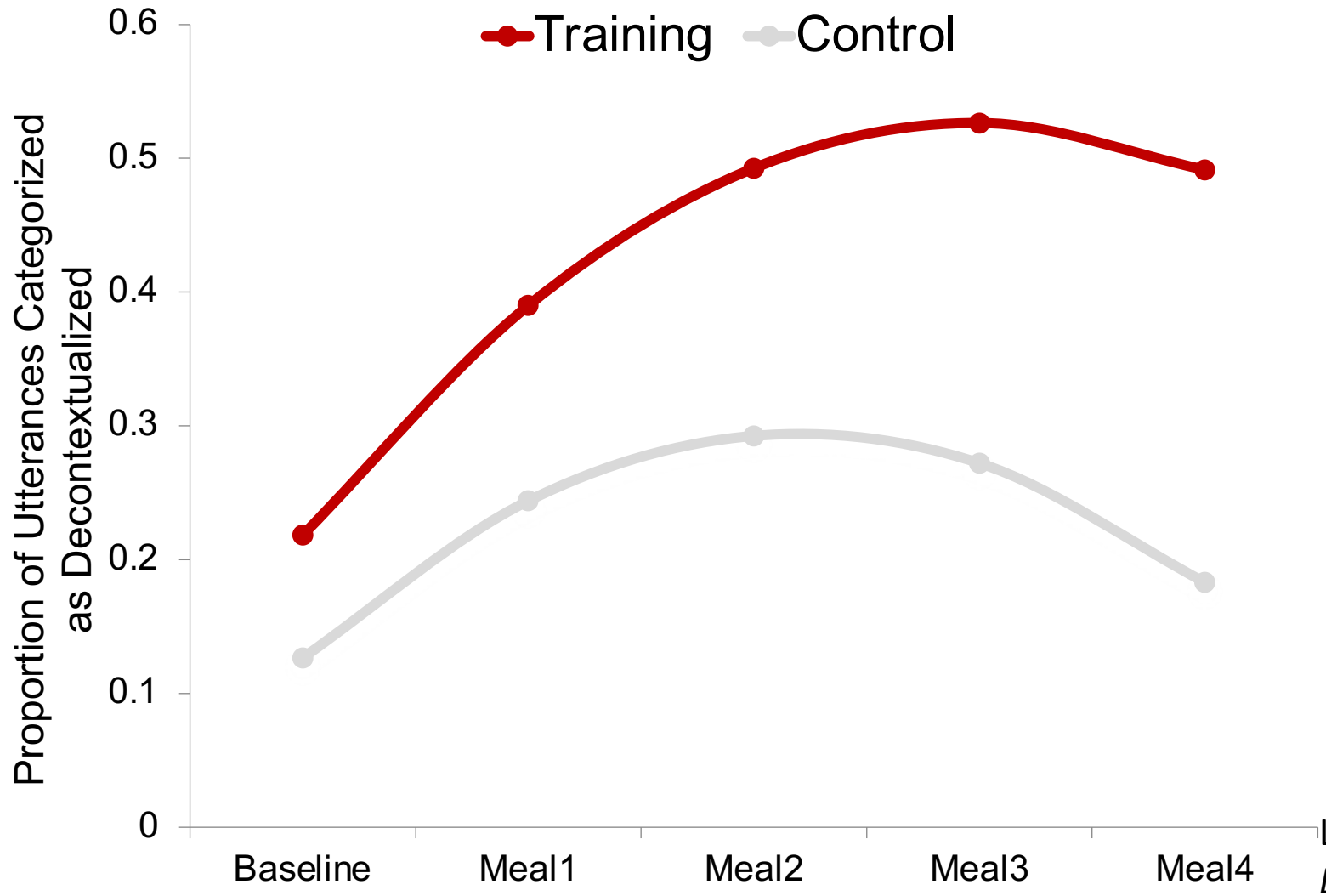
Decontextualized Talk: Parent Intervention

SES → Features of parent Input → Child Vocabulary

Is there an effect of the intervention on parent and child use of decontextualized talk?

Decontextualized Talk: Parent Intervention

SES → Features of parent Input → Child Vocabulary



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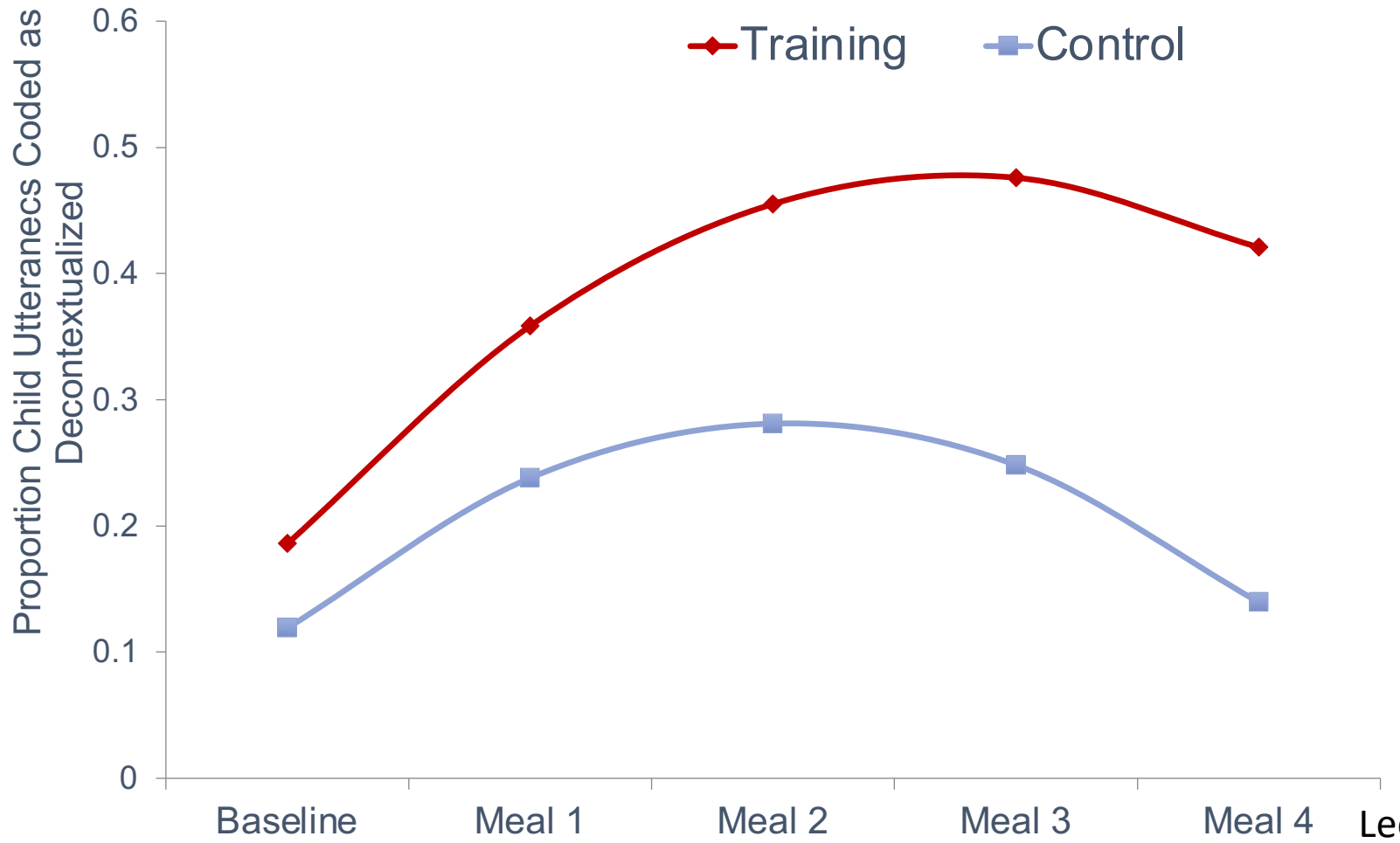

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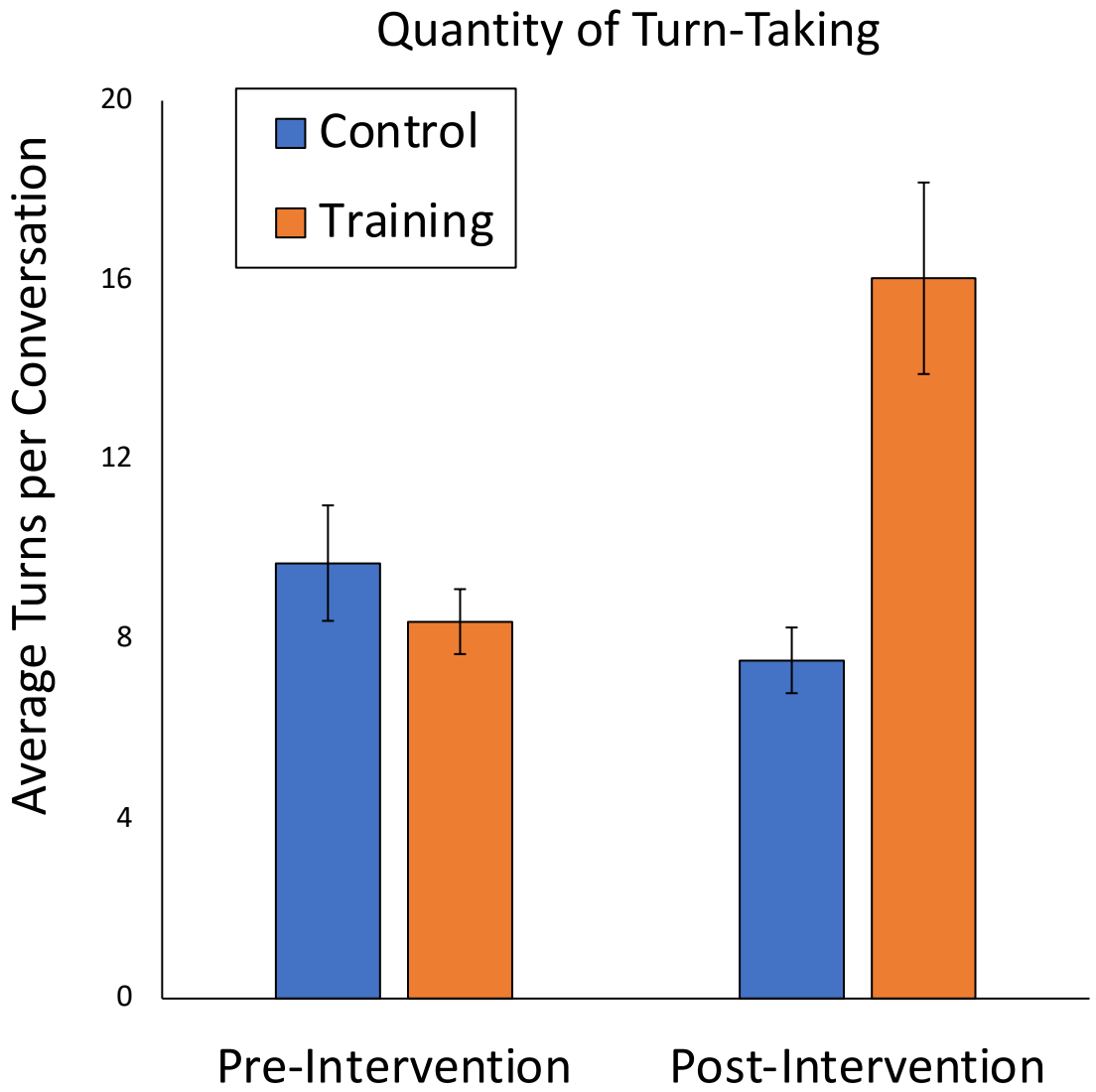


The length of conversations also increased in the intervention group compared to the control group

(Leech & Rowe, 2020)

Decontextualized Talk: Parent Intervention

Conclusions

- It is possible to increase parent use of decontextualized language, even with a brief one-time training session
- Increasing parent use of decontextualized language results in an increase in children's use of this type of language
- In future work, we need to determine longer-term child outcomes, and whether these results would transfer to other, more diverse populations.

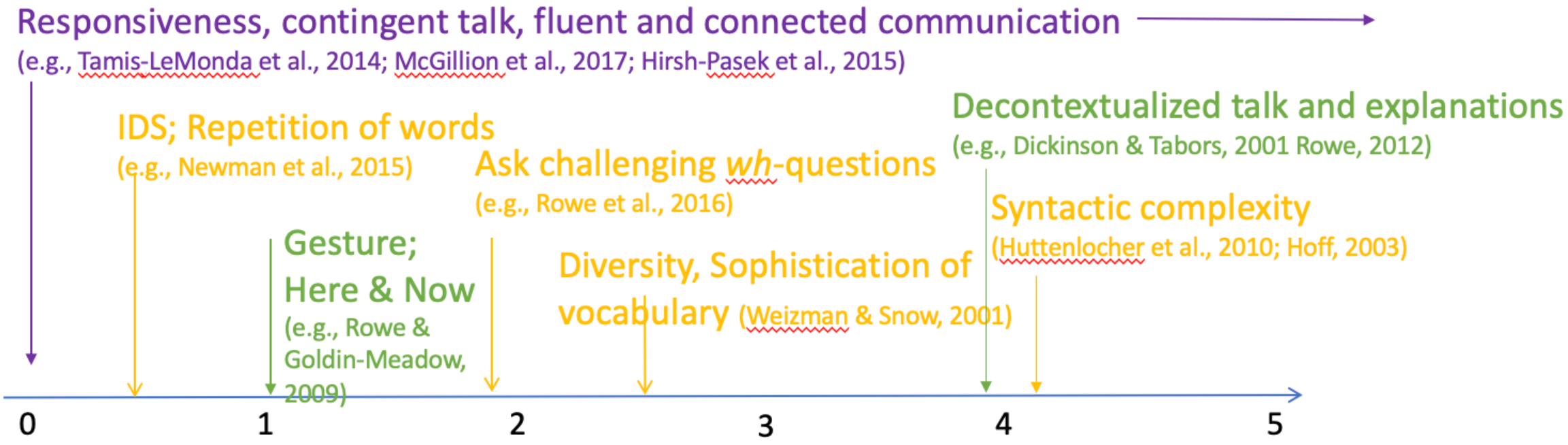
Overall Conclusions

- Families can have a large impact on their children's literacy development through their everyday social interactions and home language environment
- Caregiver communication with children can (and should) be analyzed along three dimensions:
    1. **Interactionally Supportive**
    2. **Linguistically Adaptive**
    3. **Conceptually Challenging**

- Interventions should be designed to maximize the language environment across all dimensions to best promote learning
- Moderating factors (mindset/knowledge) should be incorporated

Ongoing work & challenges

We've been developing and refining parenting curricula ("Everyday Moments") that maps on to the features of input and highlights parents' mindsets/self efficacy in promoting their children's language/literacy



Ongoing work & challenges

- Implementing intervention in different populations and with different modalities to examine what works for whom and why
  - In community centers in Ceará Brazil (funded by Lemann Brazil Research Fund)
  - Through virtual classes in USA

→ Big Challenge: How to reach parents and issue of scale? Home visits, videos, TikTok/parent influencers, community centers, libraries, virtual classrooms, preventative approach (high schools).

THANK YOU!

Why is *early* language development so important?

Early oral language skills are the foundation of literacy skills and school success