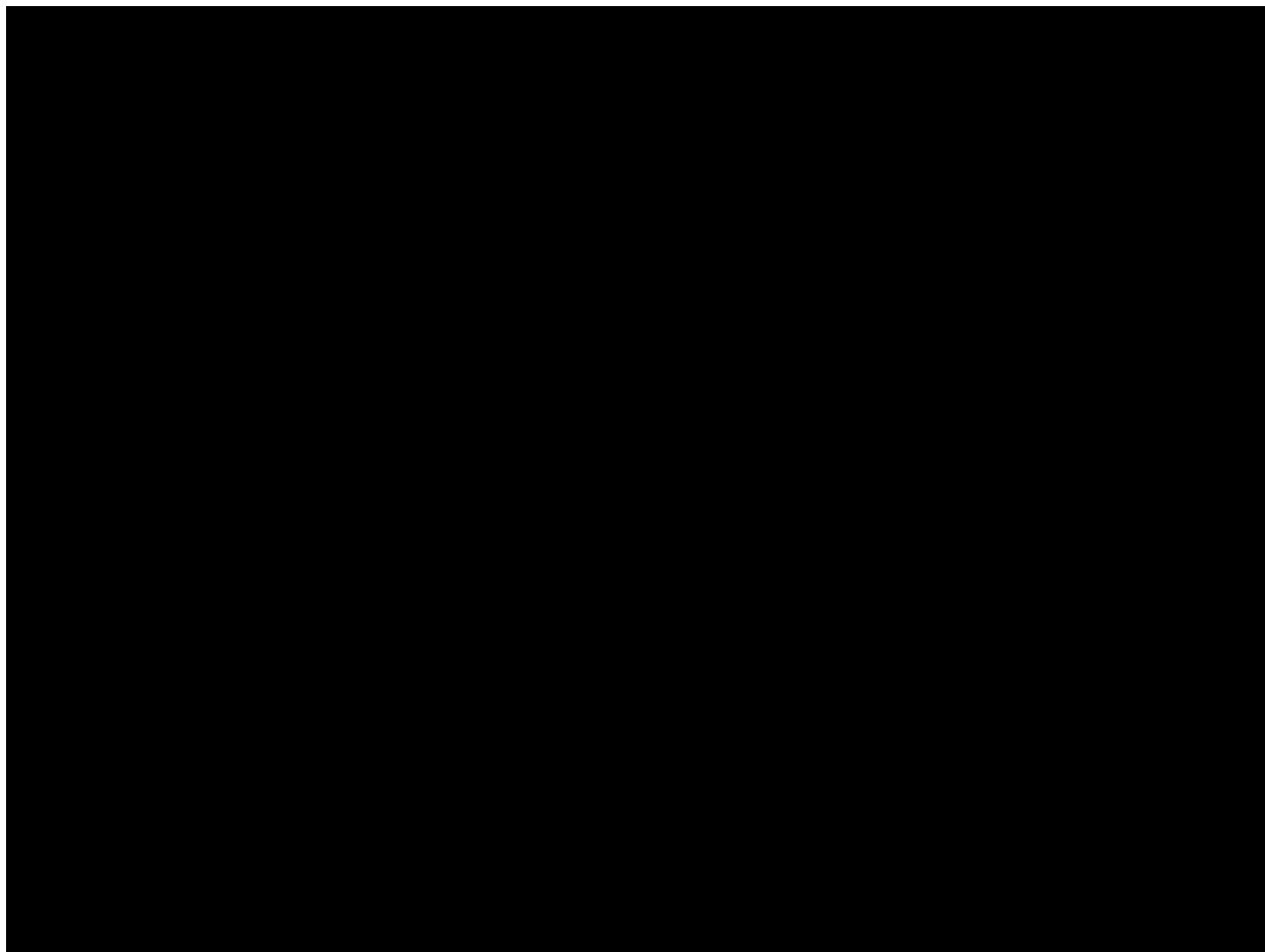


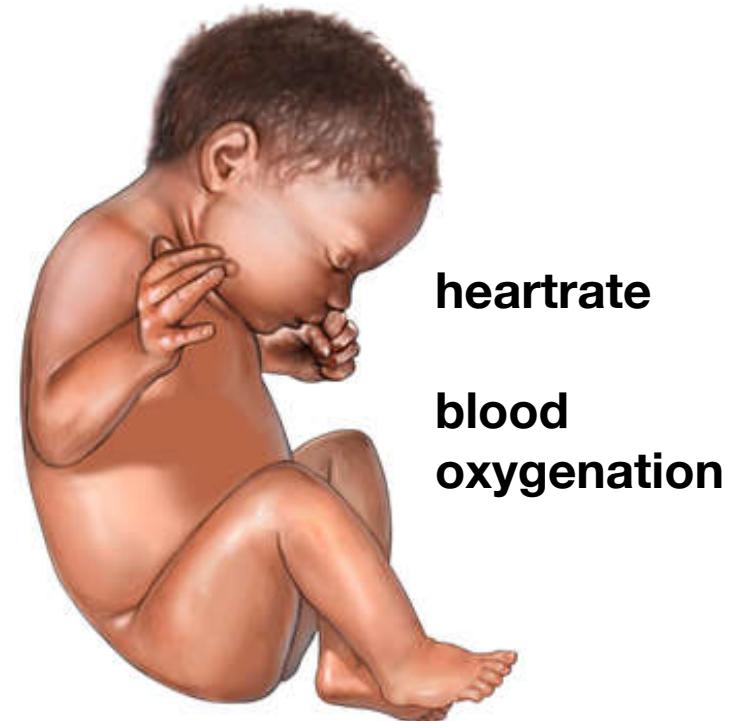
the typical course of
language acquisition



Nancy Grows Up: <https://youtu.be/6gaq5-t14FE>

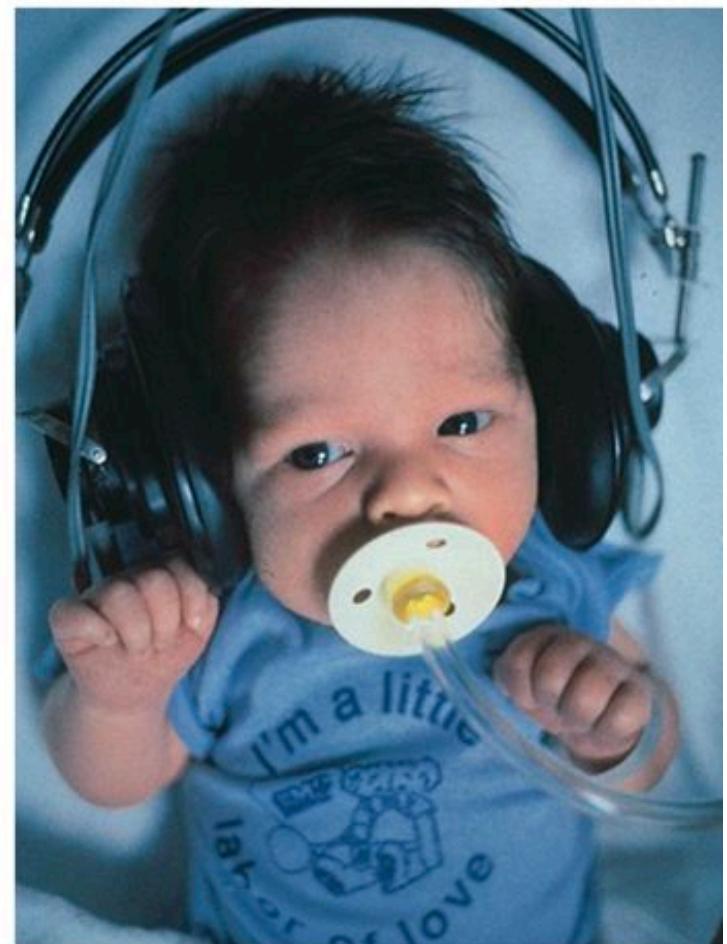
before birth

- prefer speech over non-speech
- prefer native versus non-native language across prosodic categories
- prefer mother's voice over others
- prefer specific story or rhyme exposed to in utero



fetal learning

- Mothers read *The Cat in a Hat* by Dr. Seuss, 2x/day for last 1½ months of pregnancy
- **Method:** Changes in rate of sucking turned on or off a tape recorder of mother reading (half read that story, the other half another story)
- **Finding:** Infants modified their rates of sucking in the direction that produced the familiar story



DeCasper & Spence, 1986

year 1 on the outside

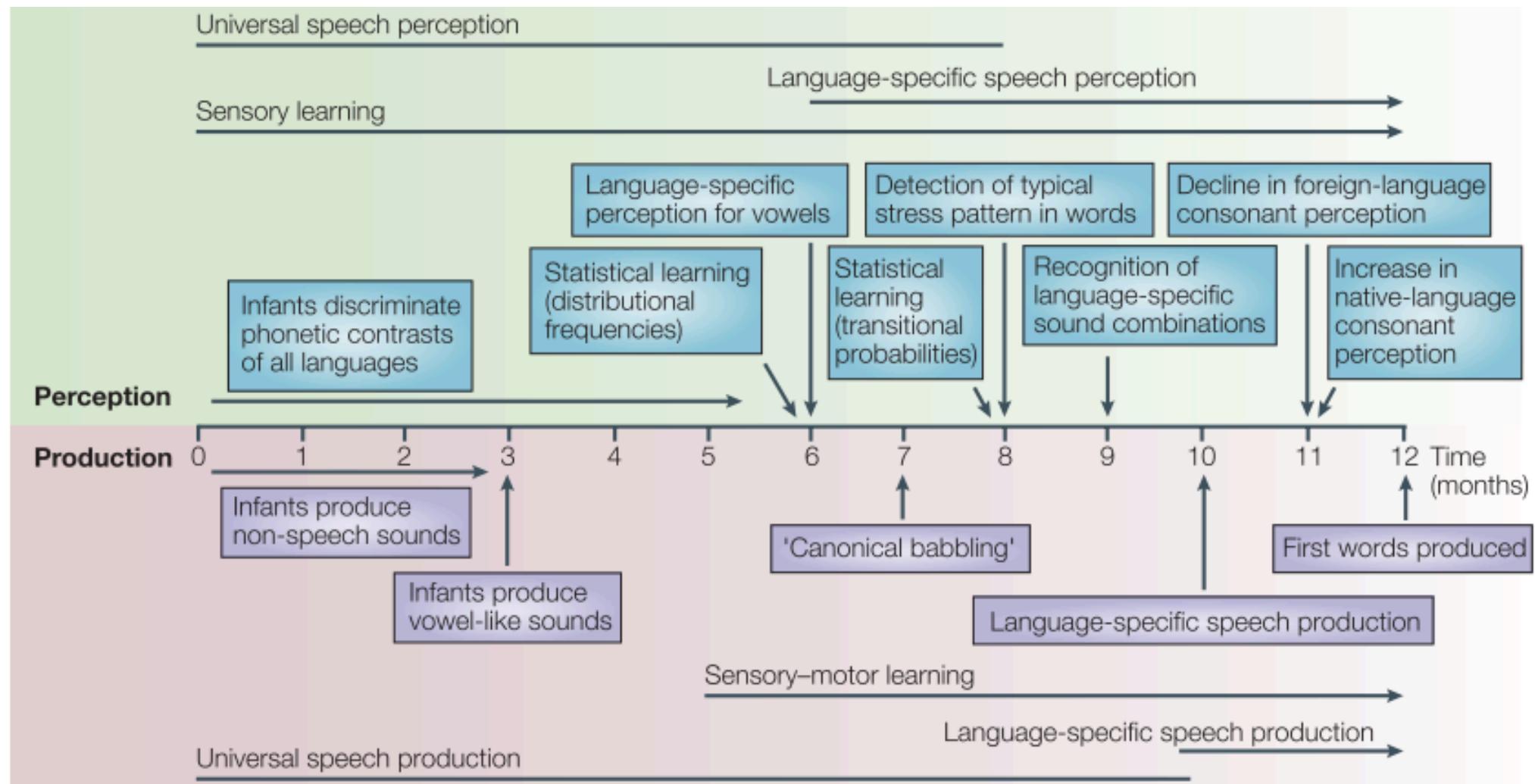


Figure 1 | **The universal language timeline of speech-perception and speech-production development.** This figure shows

Kuhl (2004)



the challenges facing the infant language learner

- using their ‘articulators’ (their lips, tongues, vocal tracts, or hands) to produce recognizable speech
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- figure out **how to use language appropriately** across different contexts

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pre-linguistic communication (0-12 mos.)

- turn-taking (3 months)
- babbling (vowels first; CV clusters at 6 months)



https://www.youtube.com/watch?v=_JmA2CIUvUY

Is babbling a linguistic activity or is it a non-linguistic motor activity?



<https://www.youtube.com/watch?v=5QdrxVy7YjU>

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a new-born can perceive all the speech sounds of the entire world's languages (about **600 consonants and 200 vowels**)

		IPA pulmonic consonants												chart image		audio	
↓ Manner	Place →	Labial			Coronal				Dorsal			Laryngeal					
		Bilabial	Labio-dental	Linguo-labial	Dental	Alveolar	Palato-alveolar	Retroflex	Alveolo-palatal	Palatal	Velar	Uvular	Pharyngeal / Epiglottal	Glottal			
Nasal	m m m̩ n n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	n̩ n̪	N N					
Stop	p b p̩ b̩ t d̩ t̩ d̩	t d	t d	t d	t d	c f̩ k g	c f̩ k g	q G	q G	?	?						
Sibilant affricate		ts dz tʃ dʒ	ts dz tʃ dʒ	ts dz tʃ dʒ	ts dz tʃ dʒ												
Non-sibilant affricate	pɸ bβ pɸ bβ pɸ bβ	tθ dð tθ dð tθ dð	tθ dð tθ dð tθ dð	cç jʃ kx gy qχ qχ	cç jʃ kx gy qχ qχ	qχ qχ	qχ qχ	ʔh ʔw ʔh ʔw ʔh ʔw	ʔh ʔw ʔh ʔw ʔh ʔw								
Sibilant fricative		s z s z s z	s z s z s z														
Non-sibilant fricative	ɸ β ɸ β ɸ β	f v θ ð θ ð	f v θ ð θ ð	θ ð θ ð θ ð	θ ð θ ð θ ð	ç j x γ x γ	ç j x γ x γ	χ ε h i h ?	χ ε h i h ?								
Approximant	ɸ ɸ ɸ ɸ	v v l l	v v l l	l l l l	l l l l	j j ŷ w ŷ w	j j ŷ w ŷ w			g g ? ?	g g ? ?						
Flap or tap	v v l l	ɾ ɾ r r	ɾ ɾ r r	ɾ ɾ r r	ɾ ɾ r r												
Trill	b b b b	r r r r	r r r r	r r r r	r r r r												
Lateral affricate		tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	cʎ kʎ gʎ	cʎ kʎ gʎ										
Lateral fricative		tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	tɬ dɮ tɬ dɮ	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ										
Lateral approximant		l l l l	l l l l	l l l l	l l l l	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ								
Lateral flap	l l l l	l l l l	l l l l	l l l l	l l l l	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ	ʎ ʎ ʎ ʎ								

Non-pulmonic consonants							
Simple clicks	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ	ʘ ʘ ʘ ʘ
	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ	ǂ ǂ ǂ ǂ
Other clicks	ʘ? ʘ? ʘ? ʘ?	ʘ? ʘ? ʘ? ʘ?					
Implosives	b b b b	d d d d	ɖ ɖ ɖ ɖ	g g g g	ɖ ɖ ɖ ɖ	χ χ χ χ	χ χ χ χ
Ejectives	p' p' p' p'	t' t' t' t'	tʃ' tʃ' tʃ' tʃ'	c' c' c' c'	k' k' k' k'	q' q' q' q'	ʔ' ʔ' ʔ' ʔ'
	f' f' f' f'	s' s' s' s'	ʃ' ʃ' ʃ' ʃ'	ʂ' ʂ' ʂ' ʂ'	χ' χ' χ' χ'	x' x' x' x'	
	ts' ts' ts' ts'	tʃ' tʃ' tʃ' tʃ'	ts' ts' ts' ts'	cʎ' cʎ' cʎ' cʎ'	kχ' kχ' kχ' kχ'	qχ' qχ' qχ' qχ'	

Co-articulated consonants				
Continuants	w w	ɥ ɥ	t t	
Occlusives	kp kp	gb gb	ŋm ŋm	h h
	tp tp	db db	nm nm	q? q?

infants are faced with the challenge of categorizing the stream of acoustic information around them into **phonemes**

TONES AND WORD ACCENTS		
LEVEL		CONTOUR
é or è	˥ Extra high	e ↗ Rising
é	˧ High	ê ↘ Falling
ē	˧ Mid	é ↙ High rising
è	˨ Low	é ↙ Low rising
ë	˩ Extra low	ë ↘ Rising-falling

Manner of Articulation	Place of Articulation								
	Bilabial	Labio dental	Inter dental	Alveolar	Alveo-palatal	Palatal	Velar	Glottal	
Stop	p b			t d			k g	?	
Fricative		f v	θ ð	s z	ʃ ʒ			h	
Affricate					tʃ dʒ				
Nasal	m			n			ŋ		
Lateral				l					
Approximant					r				
Retroflex									
Approximant									
Glide	w						j		

French Vowel Sounds

French	Symbol	As in English	French w	Advanced Tongue Root
a				Breathy voice
â	ah	card	[lah tahs]	Clicks
à			[pah-tees-ree]([pa bah](over there))	Clusters
e				
eu	uh	dull (approx)	petit [pu-tee]([sm flower])	Creaky voice
é				
ez	ey	may	les caf��s [ley kah]	Double Articulations
er			nez [luh ney]([noe to speak])	Ejectives
��				Fortis/Lenis Consonants
��			la m��re [lah meh]	Implosives
ai	eh	set	[lah fun-neh-truh]	
ei			(clean); la neige	Laryngealization
et			secret [luh suh-k]	Laterals
i				Length
��	ee	feet	vite [veet]([quick shelter]; le/les]	Mora
y			(country/country)	Murmur (breathy voice)
o			le mot [luh moh]	Nasal consonants
��	oh	boat	koht][ribs); aujour	Nasalized vowels
au			dwee]([today); l'e	Place of Articulation
eau				
o	ohh	love	la pomme [lah p]	Labial
ou	oooh	you	l'amour [lah-moo]	Coronal
��			(where)	
oi	wah	watch	la soie [lah swah]	Dorsal, Pharyngeal, Glottal
oy			yaN]([average)	Pressed voice
u	ew	No English Equivalent	salut [sah-lew](h)	Rhotics

Secondary Articulations

13ish – 80ish sounds / language



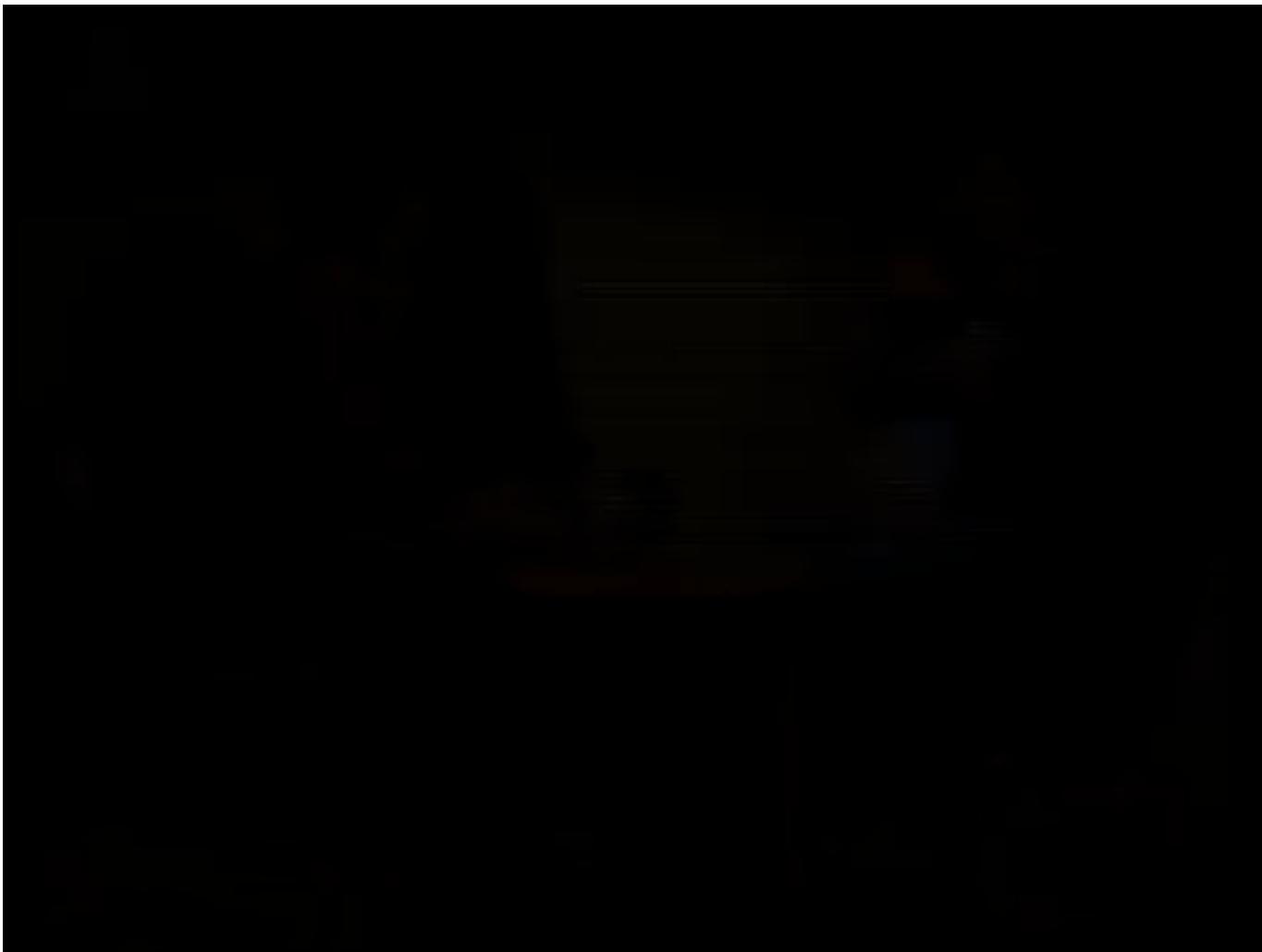
(English uses ~45)

becoming a ‘native listener’

A close-up photograph of a baby with dark hair, wearing a white onesie with a red polka-dot pattern. The baby is being held by an adult whose face is partially visible on the left, wearing an orange ribbed sweater. The background is blurred.

SOUNDS OF LANGUAGE

becoming a ‘native listener’



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even after you've figured out the sounds,
finding *words* in continuous speech isn't
easy

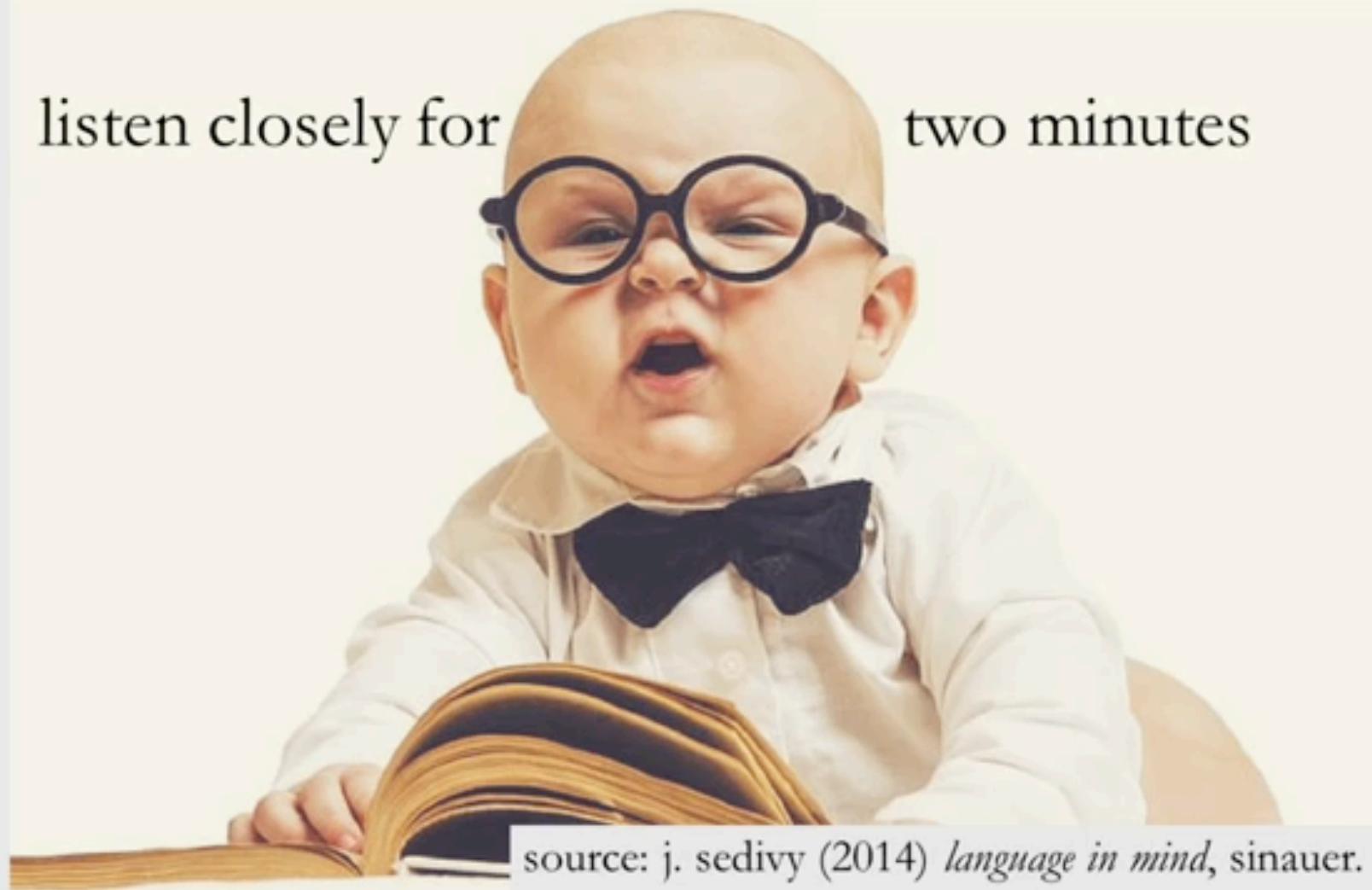




(it's not just kids who struggle)

how do infants manage? (artificial language learning demo)

listen closely for two minutes



source: j. sedivy (2014) *language in mind*, sinauer.

test: which of these are words?

instructions:

you'll hear 16 syllable pairings

write down if they are or are not part of the language (y / n)

source: j. sedivy (2014) *language in mind*, sinauer.

#	syllable pairing	in language?
1	bulado	
2	ladobi	
3	tibata	
4	dobigo	
5	bigoku	
6	datiba	
7	dupabu	
8	tadupa	
9	tibata	
10	dobigo	
11	dupabu	
12	bigoku	
13	bulado	
14	ladobi	
15	datiba	
16	tadupa	

#	syllable pairing	in language?
1	bulado	Y
2	ladobi	N
3	tibata	N
4	dobigo	N
5	bigoku	Y
6	datiba	Y
7	dupabu	N
8	tadupa	Y
9	tibata	N
10	dobigo	N
11	dupabu	N
12	bigoku	Y
13	bulado	Y
14	ladobi	N
15	datiba	Y
16	tadupa	Y

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comprehension precedes
production





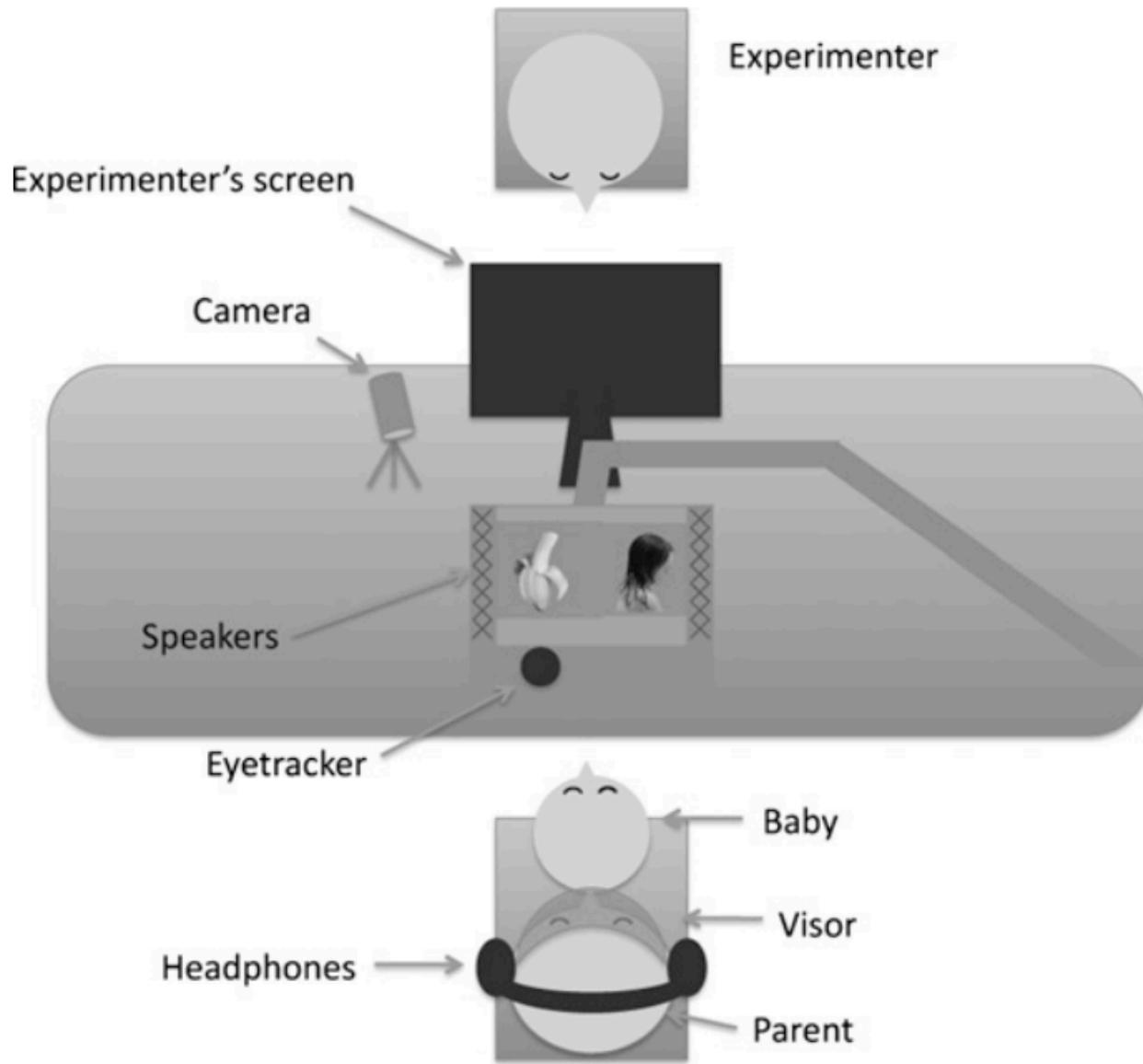
pre-linguistic communication (0-12 mos.)

- **joint attention:** ability to follow another's eye-gaze
- infants gesture/vocalize to request objects or share attention (~ 8 mos.)

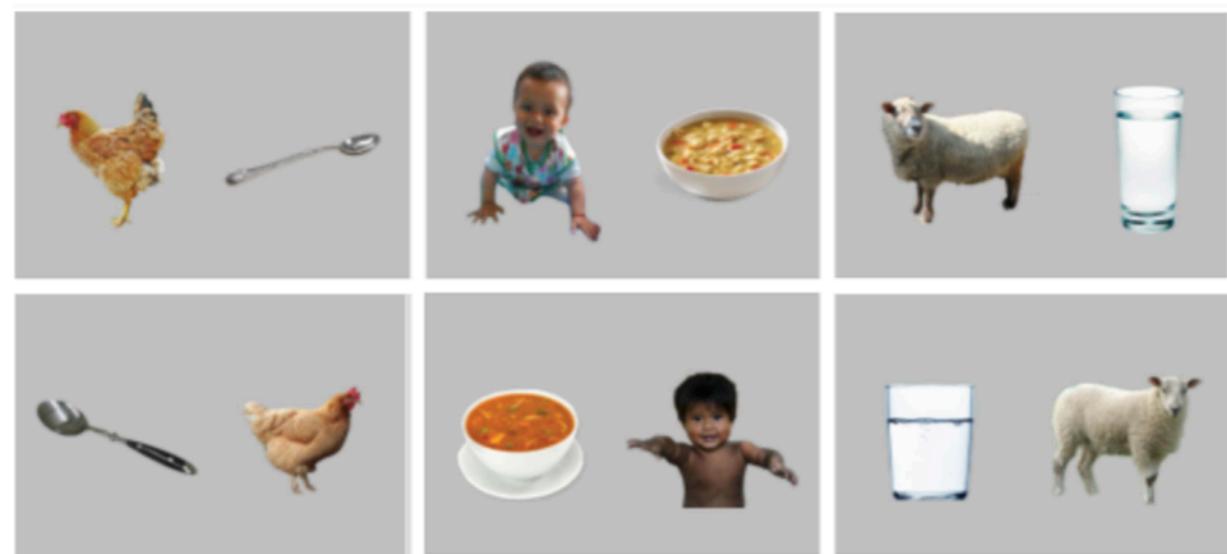
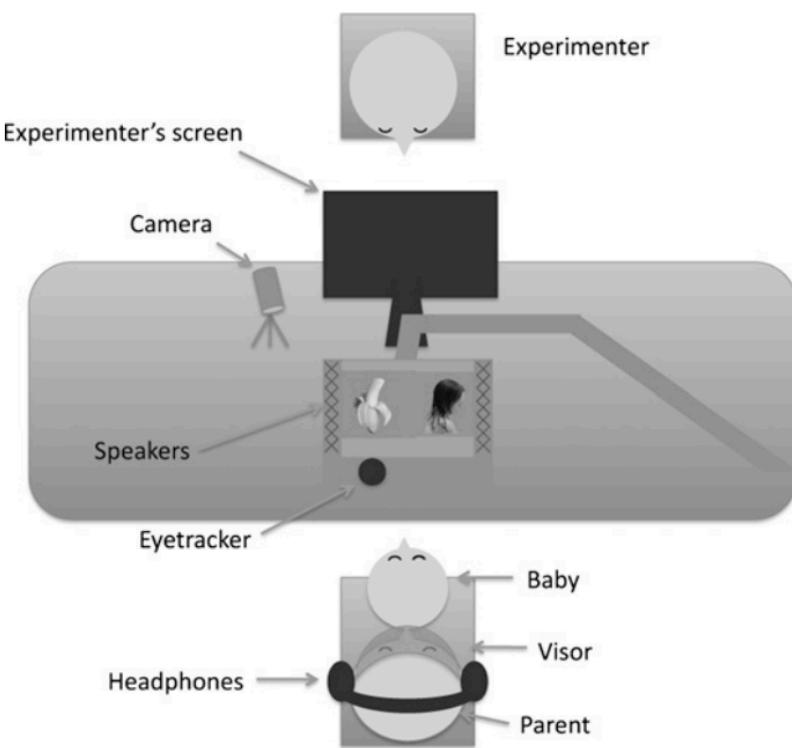
<https://www.youtube.com/watch?v=yLBuoOWdOdE>



6-9-month-olds understand many spoken words



6-9-month-olds understand many spoken words



the single-word speaker (12- 24 mos.)

(Note: children vary in when they enter these stages and how long they stay in them!!)

- Word-learning begins slow, steadily accelerates

- Initially children may make errors in mapping a word to meaning:

- **underextensions:**

dog = JUST-FIDO

- **overextensions:**

daddy = ALL-MEN

- **mismatches:**

back = STROLLER



Child insistently labels both apples and oranges "APPLE":
<https://youtu.be/AgY7nkbYFaw>

the single-word speaker (12- 24 mos.)

- **holophrases:** single words used to indicate entire proposition

“up” = (Pick me up)

“food” = (Give me food)

- Can understand complex sentences:

“Big Bird is tickling
Cookie Monster”



Researchers
use the
**preferential
looking**
method

the single-word speaker (12- 24 mos.)



Most early words
are **concrete**:
objects, people,
animals, and some
social words

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telegraphic speech (18-30 mos.)

- 2 – 3 word utterances, but **words in correct positions**

Agent (Mother)	Action <i>gave</i>	Recipient <i>John</i>	Object <i>lunch</i>	Location <i>in the kitchen.</i>
Mommy	fix.			
Mommy			pumpkin.	
Baby				table.
Give		doggie.		
	Put		light.	
	Put			floor.
I	ride		horsie.	
Tractor	go			floor.
	Give	doggie	paper.	
	Put		truck	window.
Adam	put		it	box.

Brown (1973)

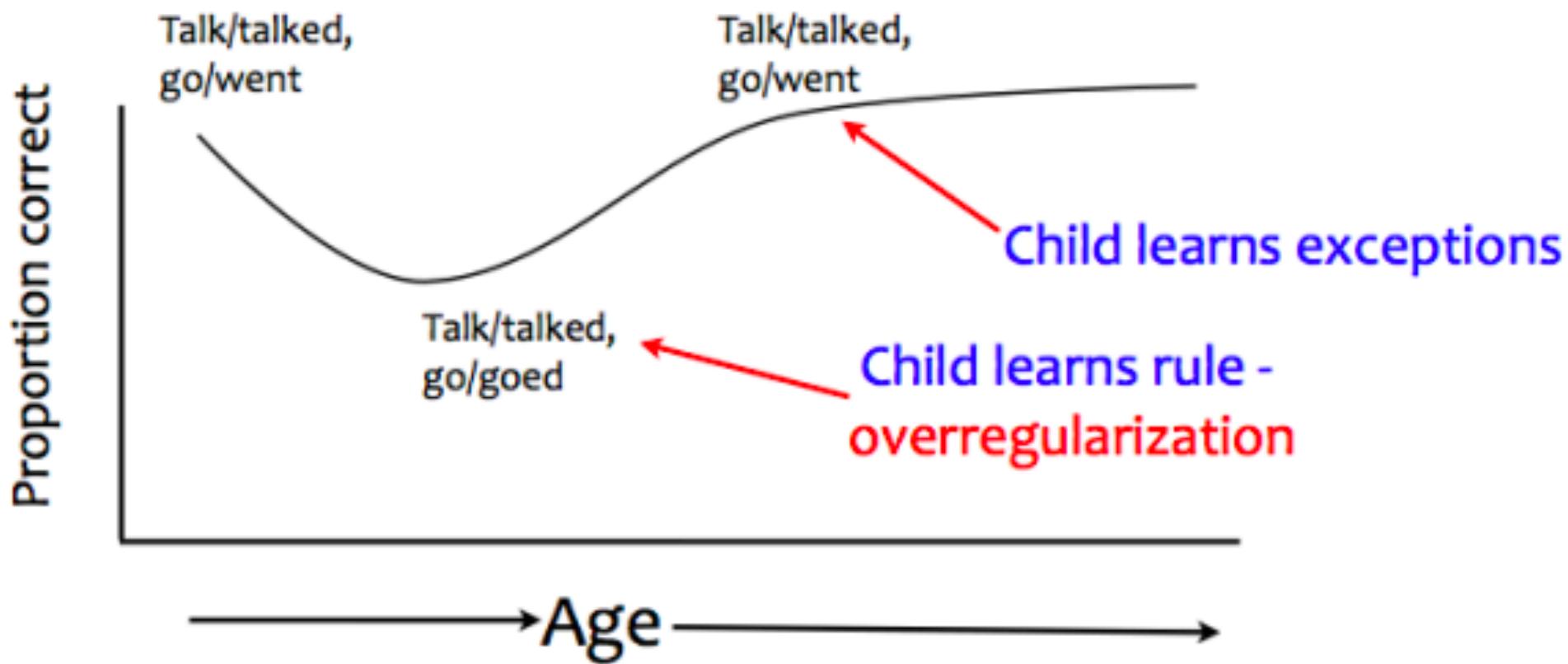
- grammatical words omitted: *the, was, of, with*
- inflectional morphemes also omitted: *-ed, -s, -ing*

further grammatical development (2-4 yrs)

- Inflections appear in speech but are over-regularized
- Child applies a regular rule to an irregular form, providing strong evidence for rule



The U-shaped curve



The wug test: “Today I will wug, yesterday I _____”?

further grammatical development (2-4 yrs)

- More complex sentences begin to appear: e.g., questions, negations, passives, multiple clauses.....

“I like all the animals that have skeletons”

- By 3, children usually follow grammatical rules - make errors under 10% of the time for a particular rule
- By 4, their grammar is almost perfect, and have mastered language-specific things (case marking, gender, etc.)

“The only two people I know who have magic powers are God up there and the Power Rangers on the cartoon channel”

During a conversation when Micah was four, I asked him something in English and he replied "Ouipe!" "What is 'ouipe'" I asked. "Well, papa," he said. "in English, you can say 'yes' or 'yep', so in French you can say 'oui' or 'ouipe.'"

About the same time, Micah asked me if he could do something and I replied "You bet," meaning "yes, of course." "I AM NOT!" he replied, indignant. Because we mixed French and English a lot, he had interpreted what I said as a mixed version of 'tu es bête' [you're stupid].

at 3yrs my son said, when he had a stomach ache: "*there's a fire-engine in my stomach*"

my daughter said one day: "*My mind is very angry, and so am I*"

when I asked my son why he is good at chess he said: "because I use my brain, instead of thinking" (e.g., "thinking" might be just daydreaming instead of focusing?)

my four year old child said "if I'm talking about myself only, I'm a children. But if I'm talking about me and Edward, we are childs because we are two." When I asked him where he heard the word 'childs', he said 'sometimes you say this is another child's bag'.

further grammatical development (2-4 yrs)

Later multi-word utterances include [profound] questions, negation

Empirical Questions	Age	Source
Why can I put my hand through water and not through soap?	3; 7	Sully (1896, p. 457)
Why won't it (wet raffia held in fire) burn?	3; 11	Isaacs (1930, p. 318)
How is it that when we put our hand into the water we don't make a hole in it? (asked when sitting at a table)	4; 0	Sully (1896, p. 469)
Why does the soap look smaller in the water?	4; 1	Isaacs (1930, p. 318)
Why do they kill the stags? They don't want their skins, do they? (on being told that seals are killed for their skins)	4; 3	Sully (1896, p. 475)
Why doesn't the butter stay on top of hot toast?	4; 4	Isaacs (1930, p. 318)
Why does water spread out flat (in the bath)? Why won't it keep up in the middle?	4; 5	Isaacs (1930, p. 318)
When I mix red and orange it makes brown, why?	6; 0	Piaget (1926, p. 179)

Metaphysical Questions	Age	Source
Where was I before I was born?	3; 10	Sully (1896, p. 458)
When are all the days going to end?	3; 11	Sully (1896, p. 458)
Well, the little seed out of the flower drops into the earth and springs up again into a flower. Why can't (dead) people do like that?	4; 3	Sully (1896, p. 479)
It's only the naughty people who are buried, isn't it, because auntie said all the good people went to heaven. (And, on being told that all people are buried) Oh, then heaven must be under the ground or they couldn't get there.	4; 7	Sully (1896, p. 479)
How did God put flesh on us and make what is inside us?	4; 9	Sully (1896, p. 478)
(After being told that clouds are penetrable) Is it another world like this (on the other side)?	5; 2	Sully (1896, p. 482)

*Is it another world like this [on the other side of clouds]?
When are all the days going to end?*

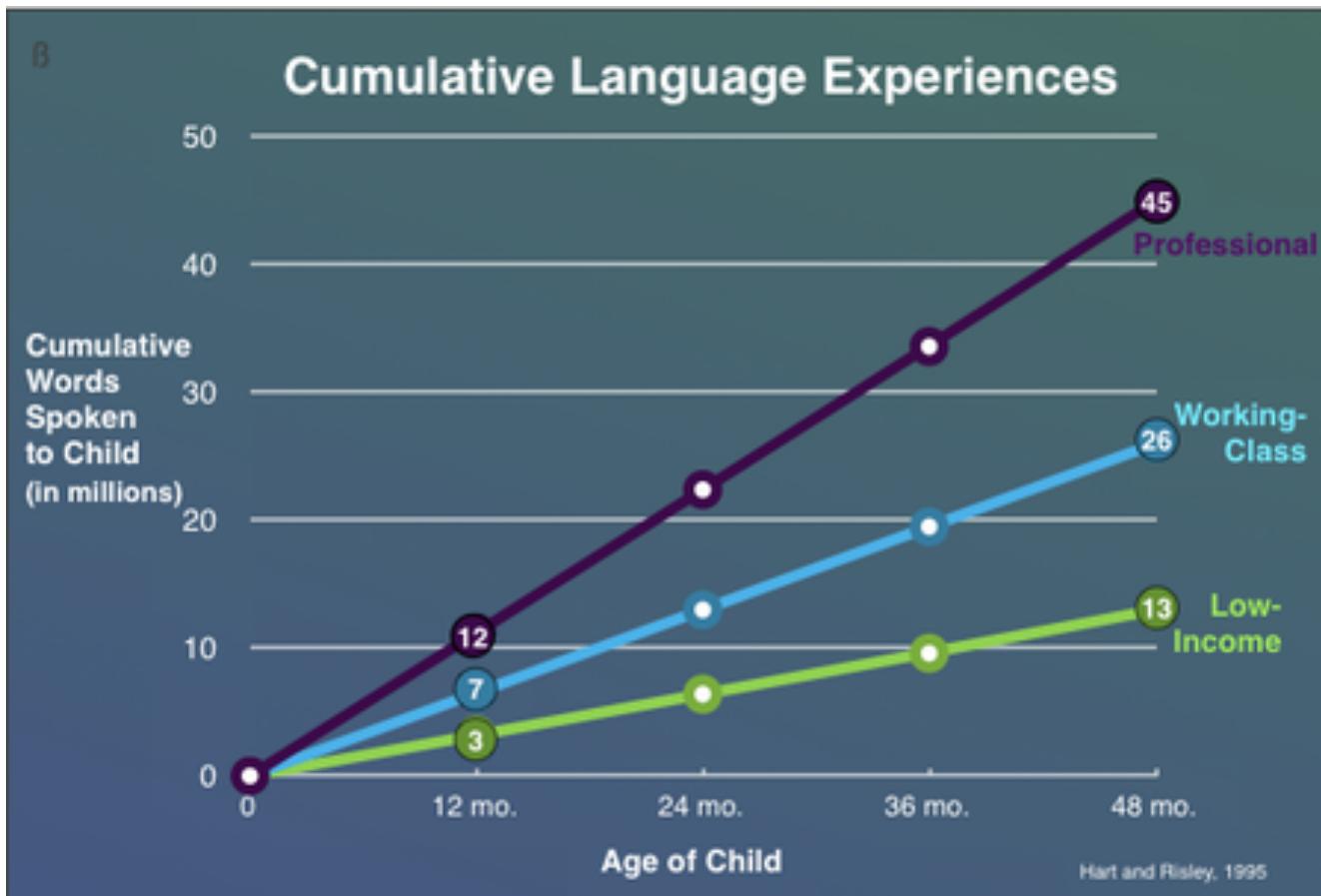
later developing semantic/
grammatical knowledge...

- mental language
- subjective language
- sociolinguistics
- pragmatic inference
- metalinguistic knowledge

Discussion

- what affected by environment? “culture”?
- what affected by language variation, dialects, etc.?

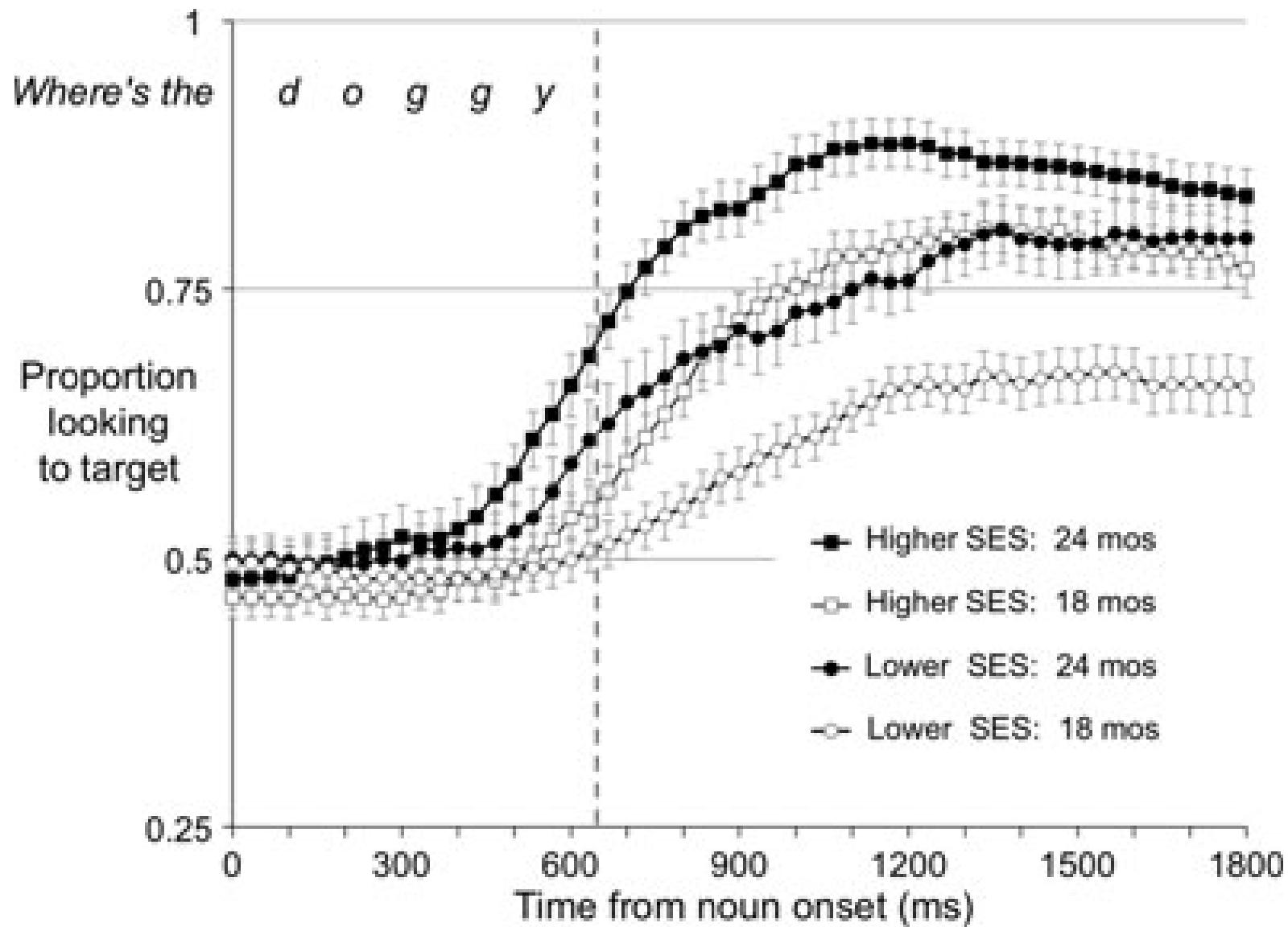
macro-level factor: SES



children from lower SES households hear fewer words ("the word gap")

amount of talk correlates with vocabulary growth

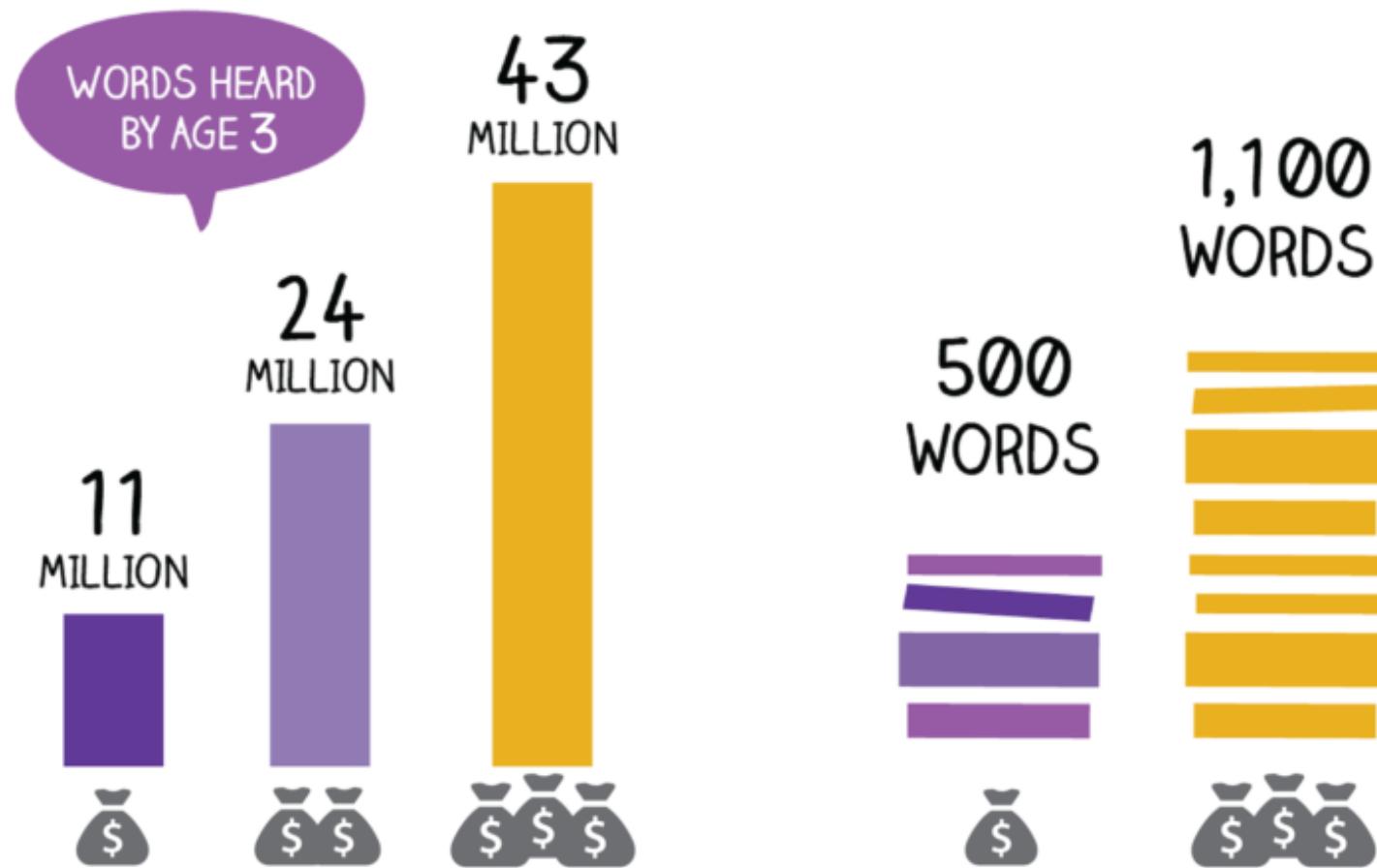
effects of SES on language processing ability



early language ability the best predictor of later academic success

helps explain the SES "achievement gap" in school

While popularized by Hart & Risley (1995),



BY THE AGE OF 3, HIGH-INCOME CHILDREN HAVE
DOUBLE THE VOCABULARY OF LOW-INCOME CHILDREN

SES-CDS correlations have been well-documented, over a long history

In the mid 1900s...

- **Didactic conversations** (Milner, 1951)
- **Less engagement in rituals like mealtimes** (Milner, 1951)
- **More directives** (Bernstein, 1960; Bayley & Schaefer, 1960; Walters, Connor, & Zunich, 1964; Bee et al., 1969; Snow et al.; Nelson, 1973; Clarke-Stewart, 1973)
- **Longer, less complex utterances** (Hess & Shipman, 1965; Bee et al., 1969)
- **Fewer elaborations/contingent responses** (Bernstein, 1961; Tulkin & Cohler, 1972; Ramey, Farran, & Campbell, 1978)



Monica Ellwood-Lowe
she/her

SES-CDS correlations have been well-documented, over a long history

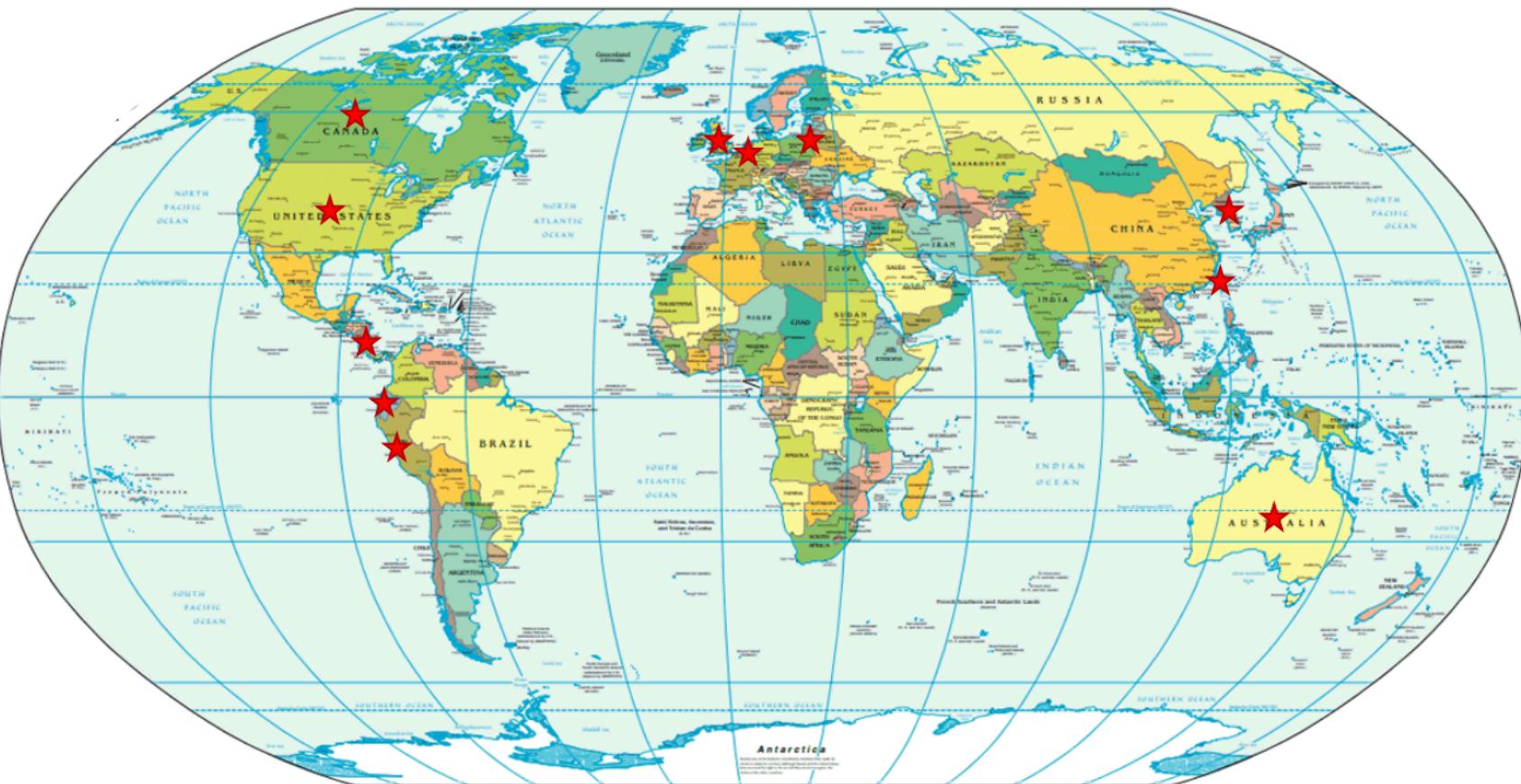
More recently...

- Kelly et al., 1996
- Gilkerson et al., 2009
- Jarrett, Bahar, & Kirsh, 2016
- Ellwood-Lowe, Mastin, Marchman, & Fernald, under revision
-
- Hoff-Ginsberg, 1991
- Hart & Risley, 1995
- Hoff, 2003
- Rowe, 2012
- Romeo et al., 2018
-



Monica Ellwood-Lowe
she/her

& they show up all over the world



Snow et al., 1976; Schady et al., 2015; Kim, Kim, & Do, 2018; Dwyer et al., 2018; etc.

Monica Ellwood-Lowe
she/her

...mobilizing researchers and policy-makers to intervene...

Here's how it works: participating families receive free access to a "word pedometer" and bi-weekly coaching from trained home visitors. The "word pedometer", developed by the Colorado-based [LENA Research Foundation](#), filters out television and background noise and develops a comprehensive picture of a child's daily auditory environment, including adult word count and the number of conversational interactions the child engages in during the course of the day.

Participating families receive these data during a bi-weekly coaching visit. Families also receive targeted coaching and information on existing community resources like read-aloud programs at neighborhood libraries or special events at local children's museums.



Monica Ellwood-Lowe
she/her

but what assumptions about the root cause of CDS gradations are they making?

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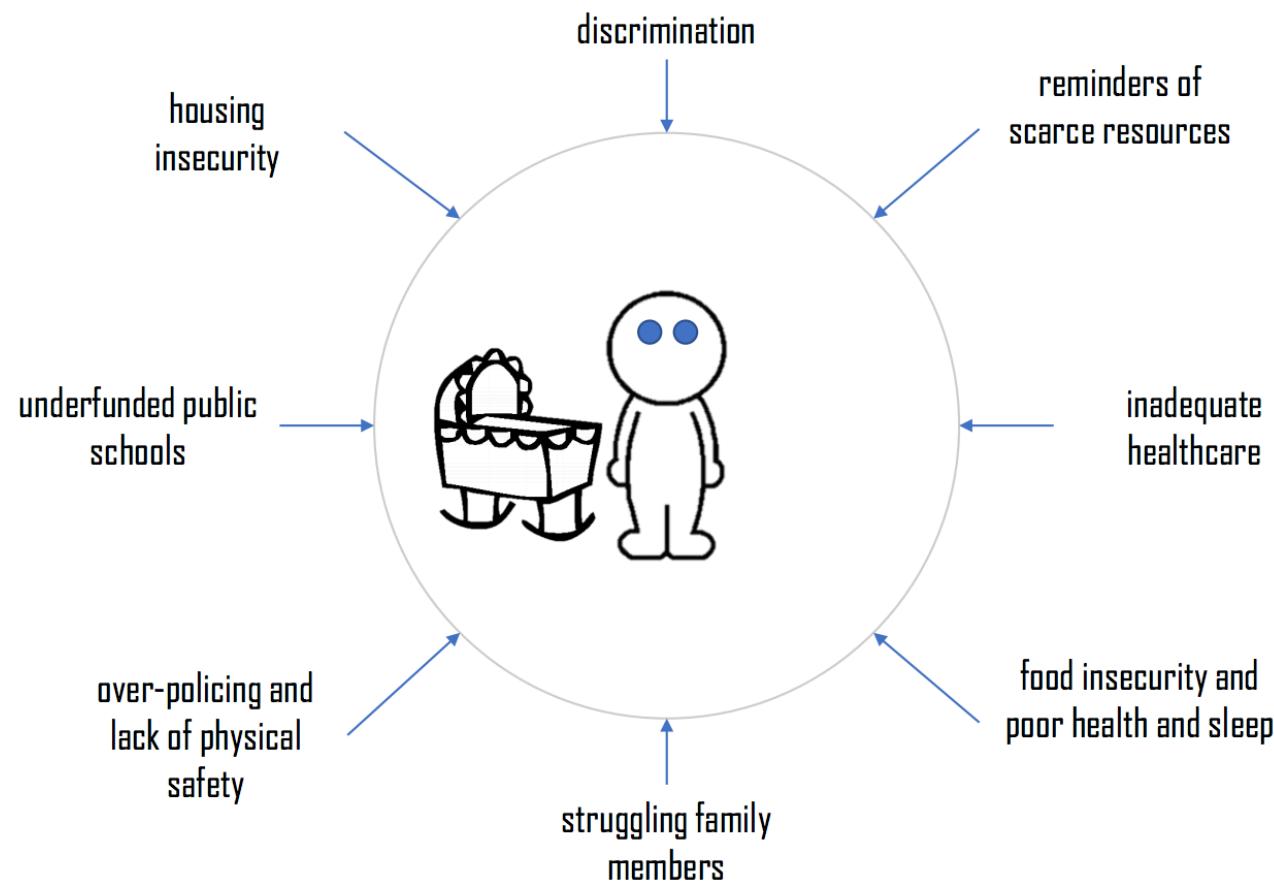
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(in what system of the bioecological model?)

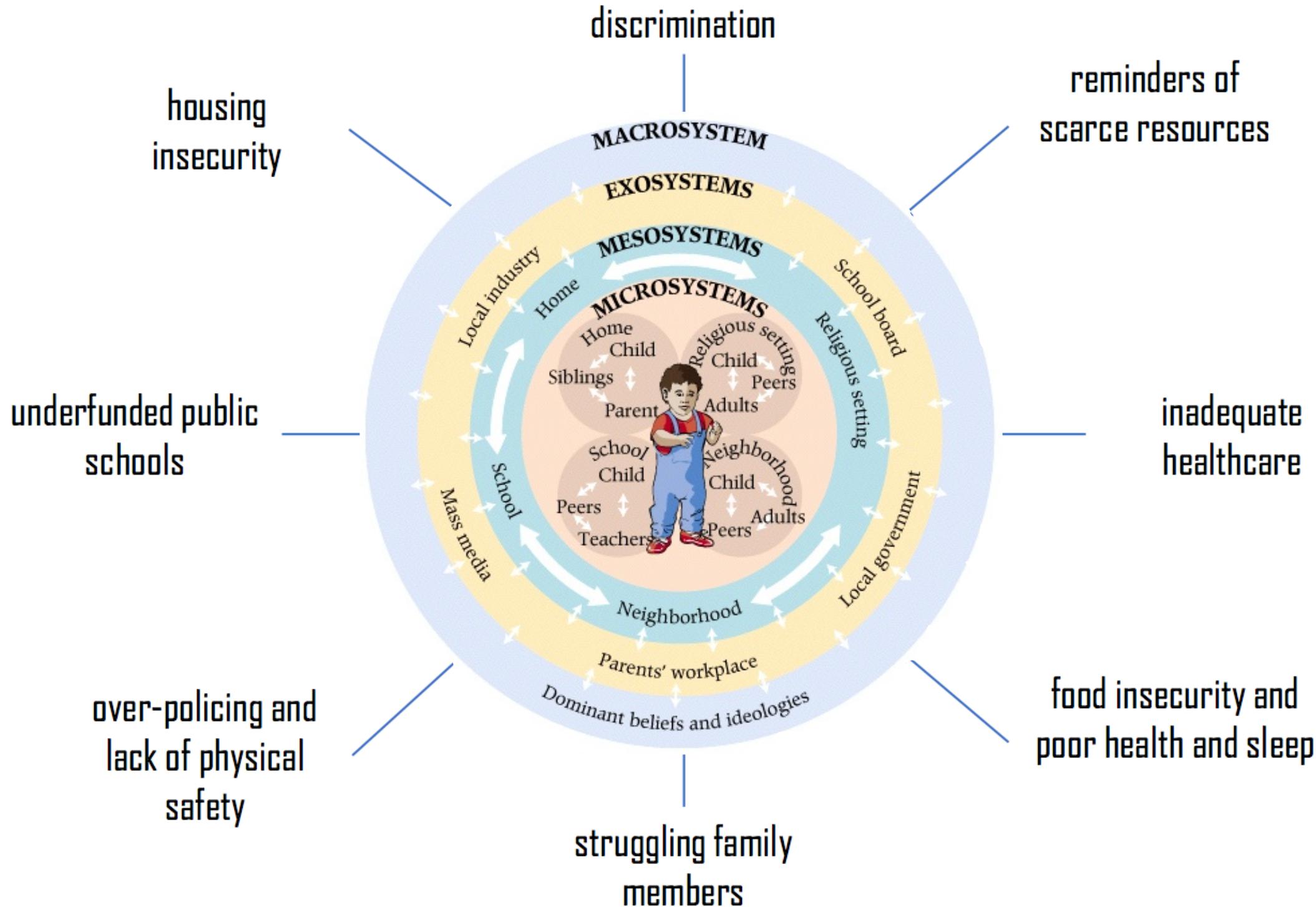


Monica Ellwood-Lowe
she/her

across time & space, what caregivers occupying lower socioeconomic positions have in common is not micro



Monica Ellwood-Lowe
she/her

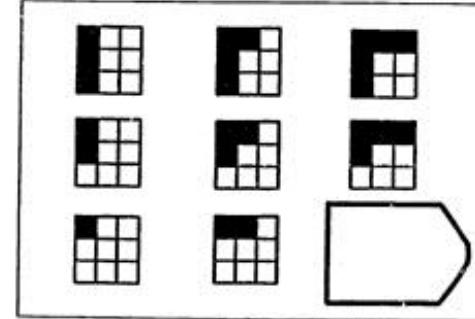


poverty has cognitive effects...

Testing farmers before and after the harvest...

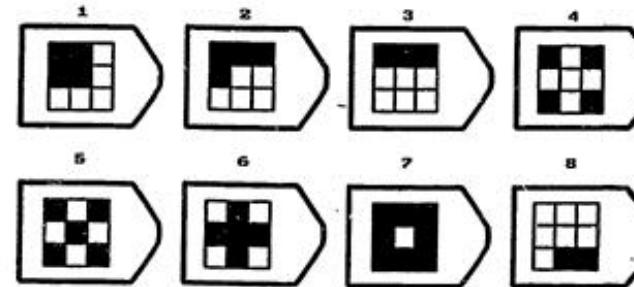


Raven's Matrices



Stroop Task

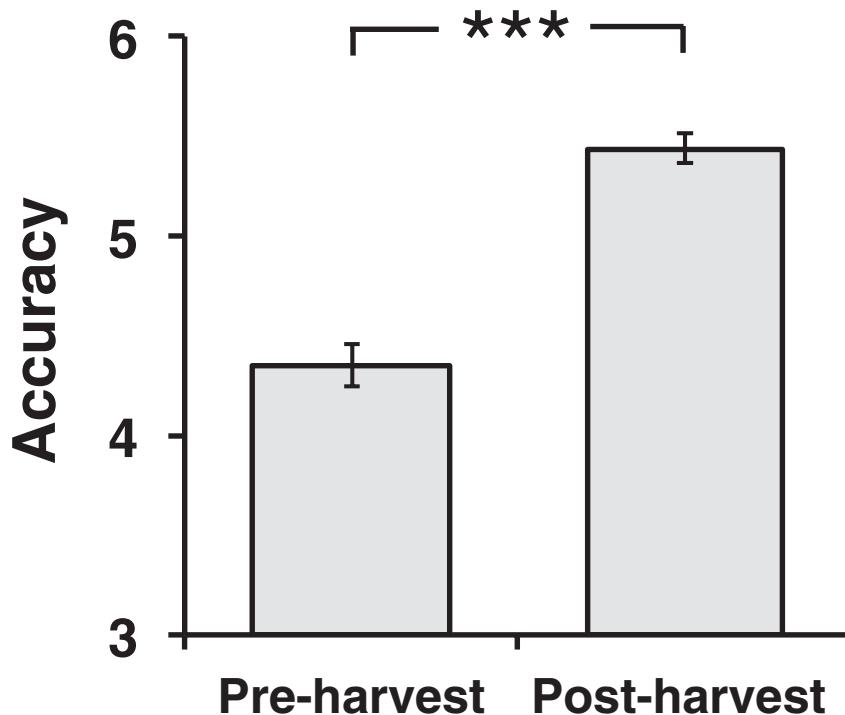
5 5 5 → "Three"



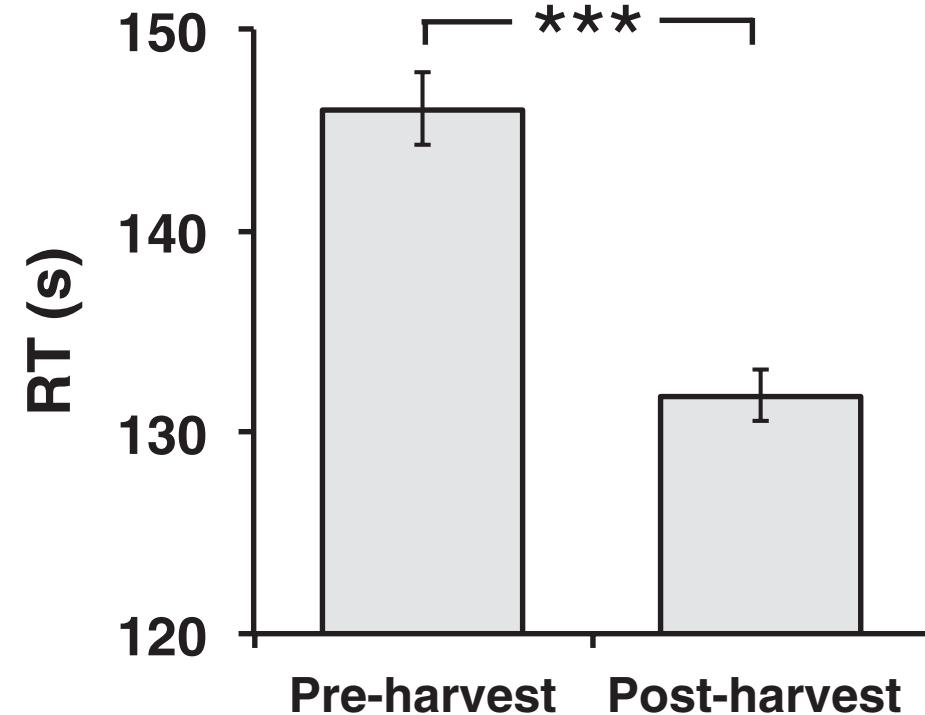
Mani et al (2013)

could reduced child-directed speech stem from cognitive effects of poverty as opposed to ignorance of how to parent?

Raven's Matrices



Cognitive Control



open questions and areas of contention

- What is the cause of SES differences in how much parents speak to children?
 - Intervention efforts seem to assume a knowledge gap in parenting
- If child-directed speech is more effective, what does this mean about communities in which it is rare?
 - Can children in these communities adapt their learning strategies?

DISCUSSION BREAK

micro-level predictor: gender

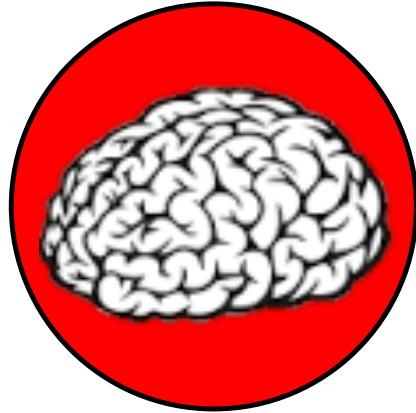
- Girls show an advantage in early vocabulary growth (Doran, 1907; Nelson, 1973; Huttenlocher et al., 1991, 1989, Eriksson et al., 2012; Frank et al, 2016)
- Difference in vocabulary size attributable to more input to girls? (Cherry & Lewis, 1976, 1978; Halverson & Waldrop, 1970)
- Counterevidence: No difference in quantity of speech directed to girls and boys (Clarke-Stewart ,1973; Cohen and Beckwith, 1976)

micro-level predictor: gender

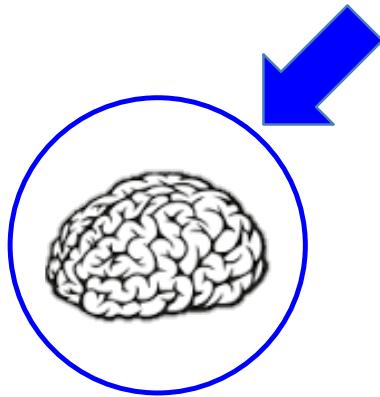
- Girls show an advantage in early vocabulary growth (Doran, 1907; Nelson, 1973; Huttenlocher et al., 1991, 1989, Eriksson et al., 2012; Frank et al, 2016)

...why?

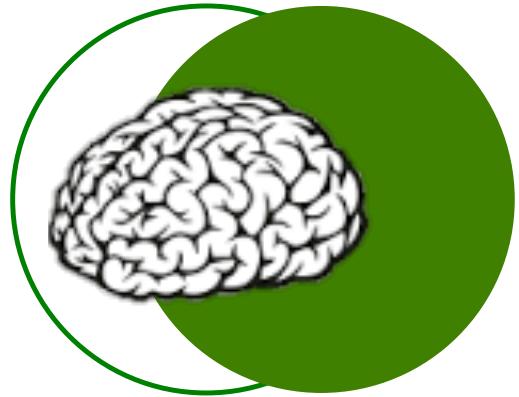
why?



experience –
independent



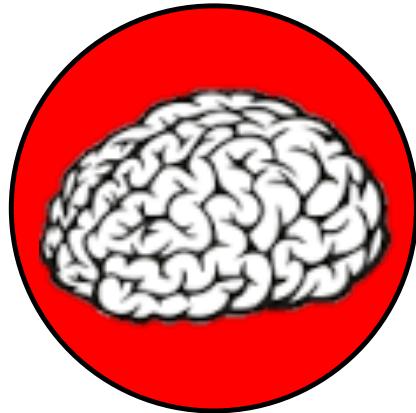
experience –
dependent



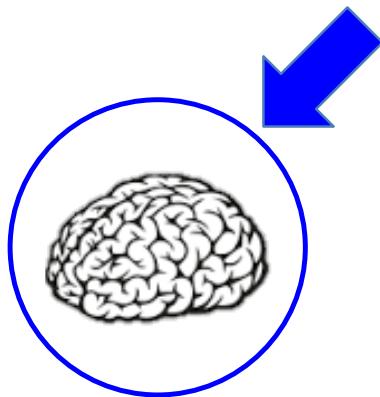
experience –
expectant

DISCUSSION BREAK

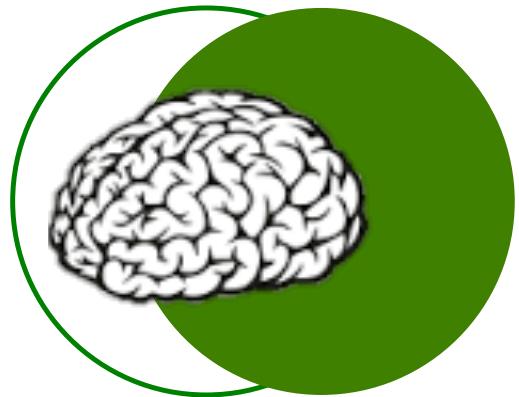
why?



experience –
independent



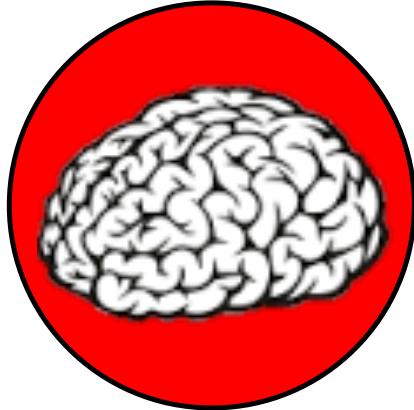
experience –
dependent



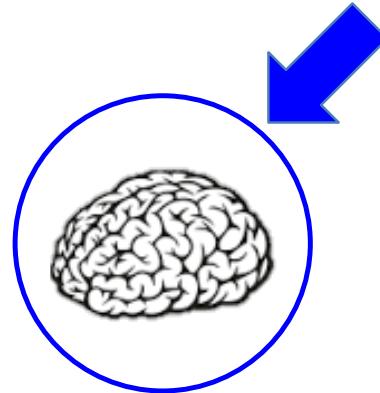
experience –
expectant

*biological
differences
between
sexes*

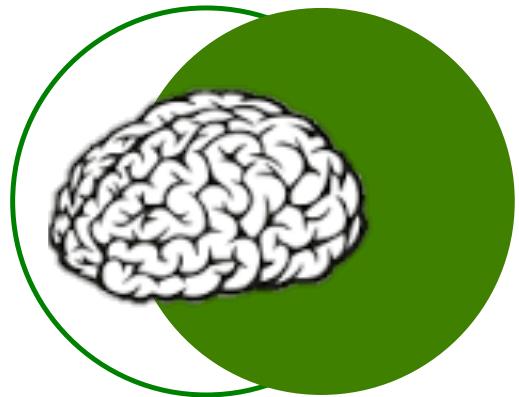
why?



experience –
independent



experience –
dependent



experience –
expectant

*biological
differences
between
sexes*

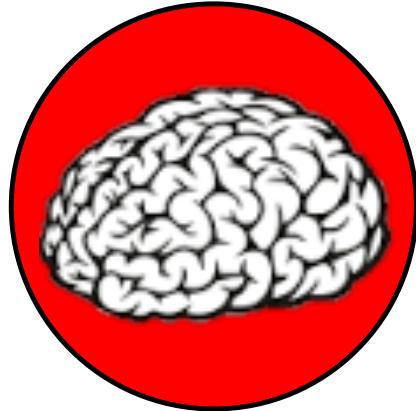
*parents direct
different amounts
of speech to their
children, based on
gender*

but...

mixed evidence:

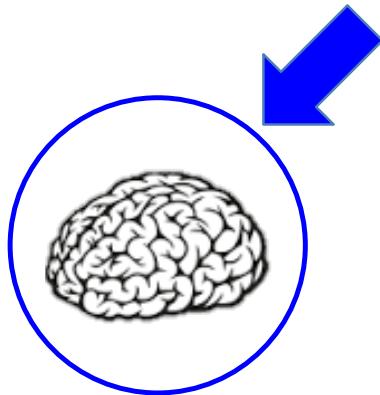
- More input to girls? (Cherry & Lewis, 1976, 1978; Halverson & Waldrop, 1970)
- No difference in quantity of speech directed to girls and boys (Clarke-Stewart ,1973; Cohen and Beckwith, 1976)

why?



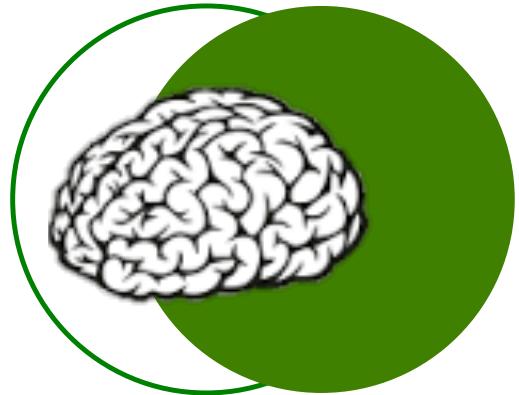
experience –
independent

*biological
differences
between
sexes*



experience –
dependent

*e.g., parents direct
different amounts
of speech to their
children, based on
gender*



experience –
expectant

*e.g., girls/boys
might orient
toward different
stimuli, eliciting
different input
(labeling, etc.)
from parents*

- Girls show an advantage in early vocabulary growth (Doran, 1907; Nelson, 1973; Huttenlocher et al., 1991, 1989, Eriksson et al., 2012; Frank et al, 2016)

...why?

to ask this question, we can look at the rate children acquire **individual words**...

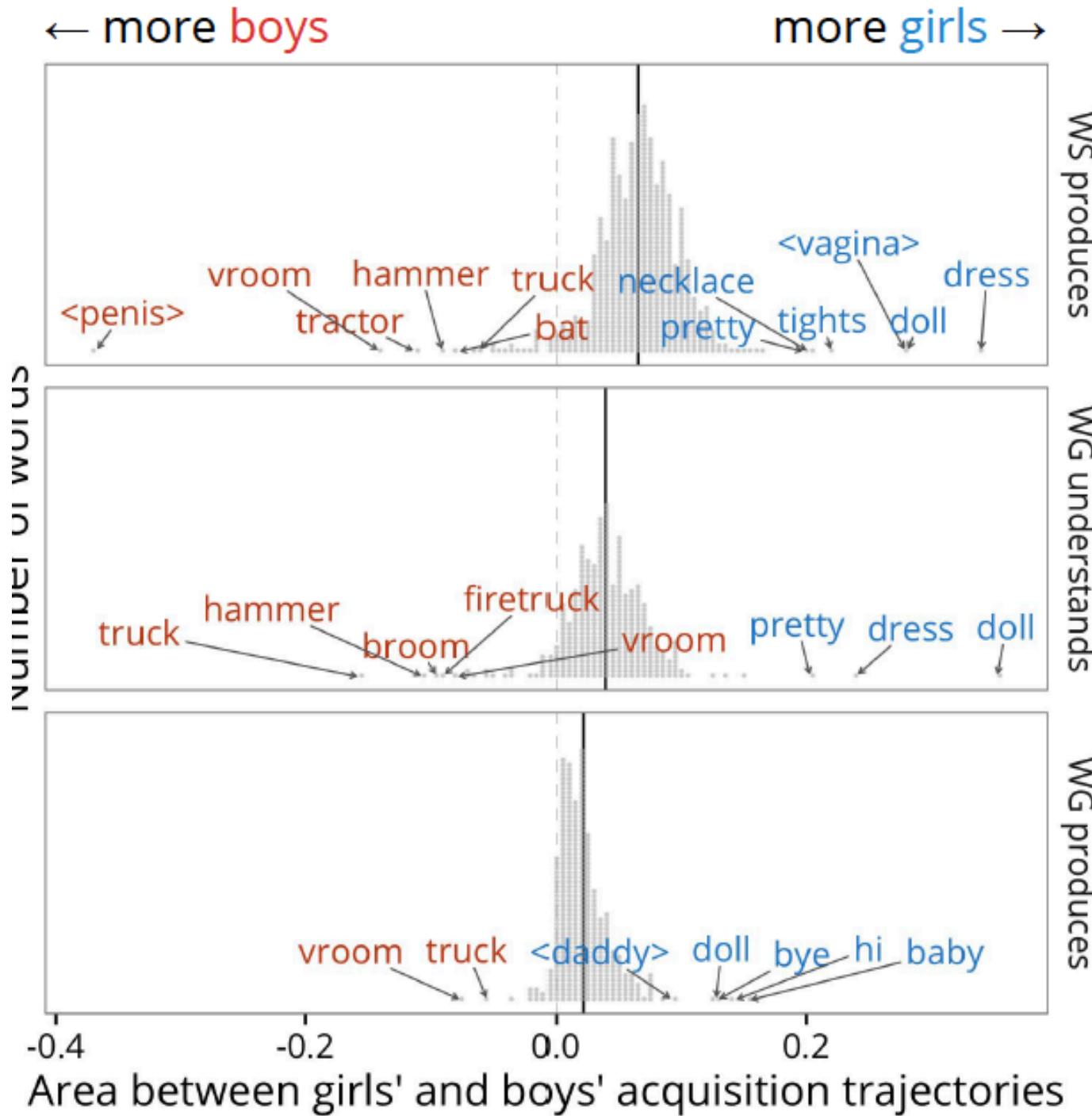


Mika Braginsky
they/them

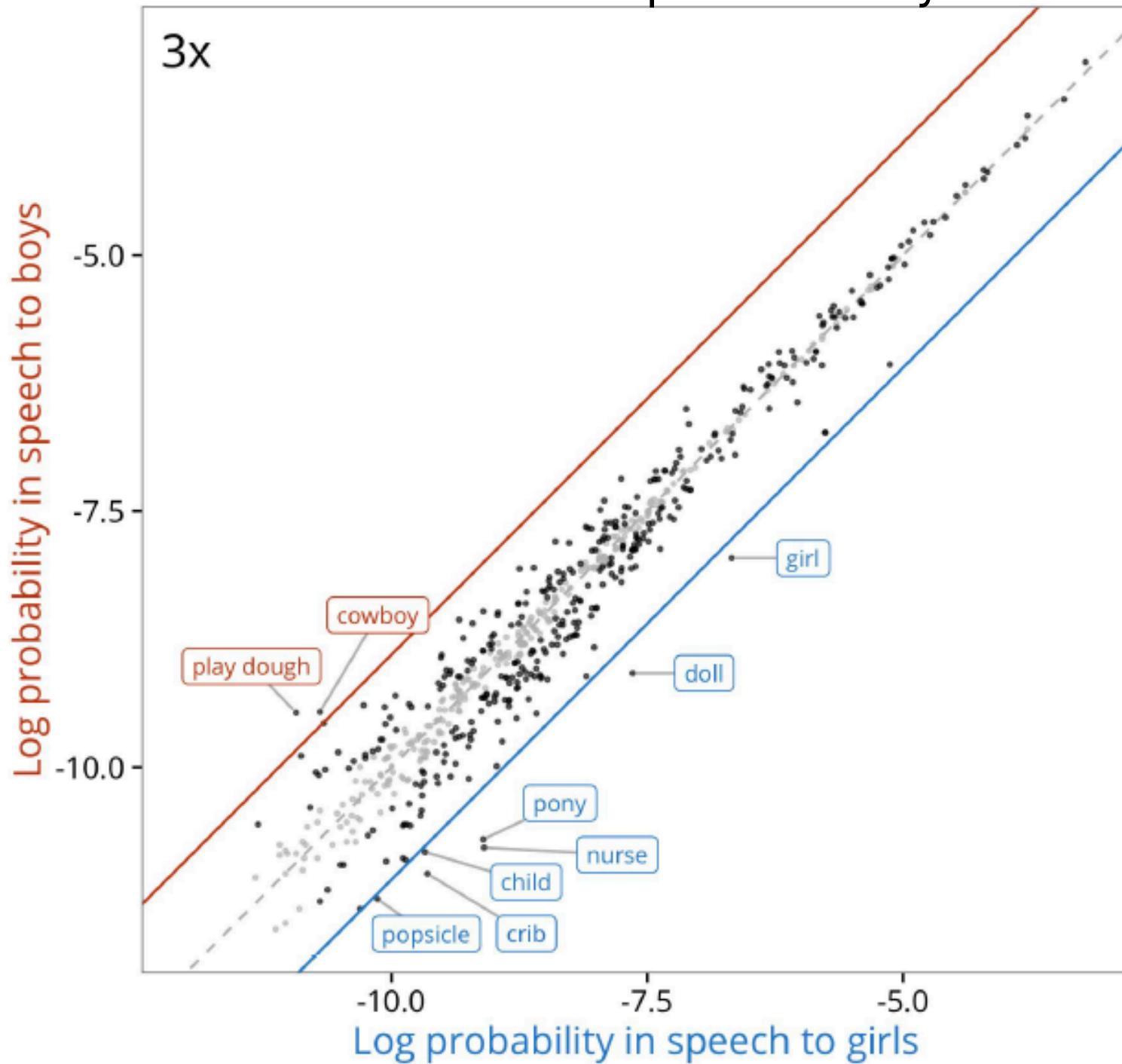


Stephan Meylan
he/him

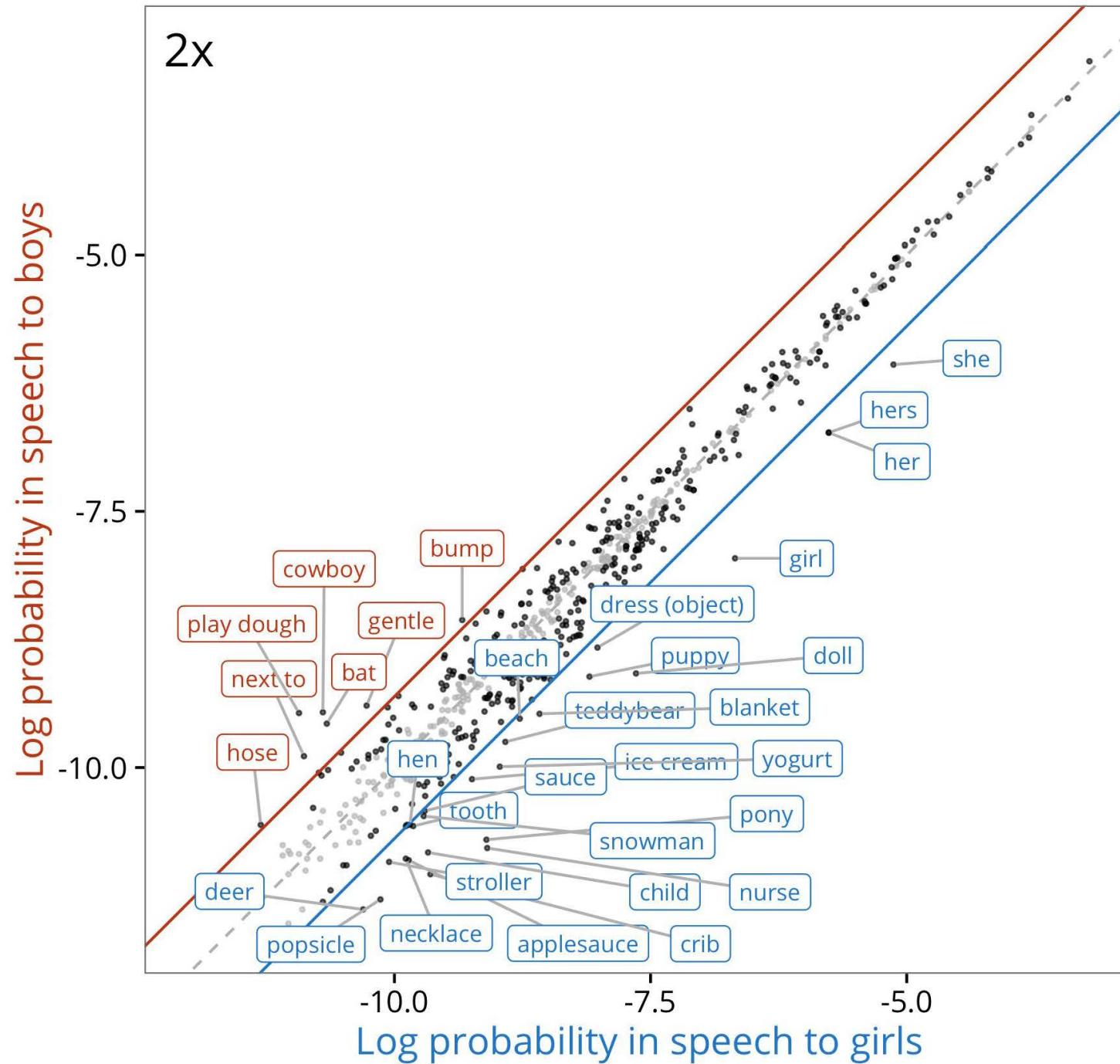
which ones do more boys/girls know?



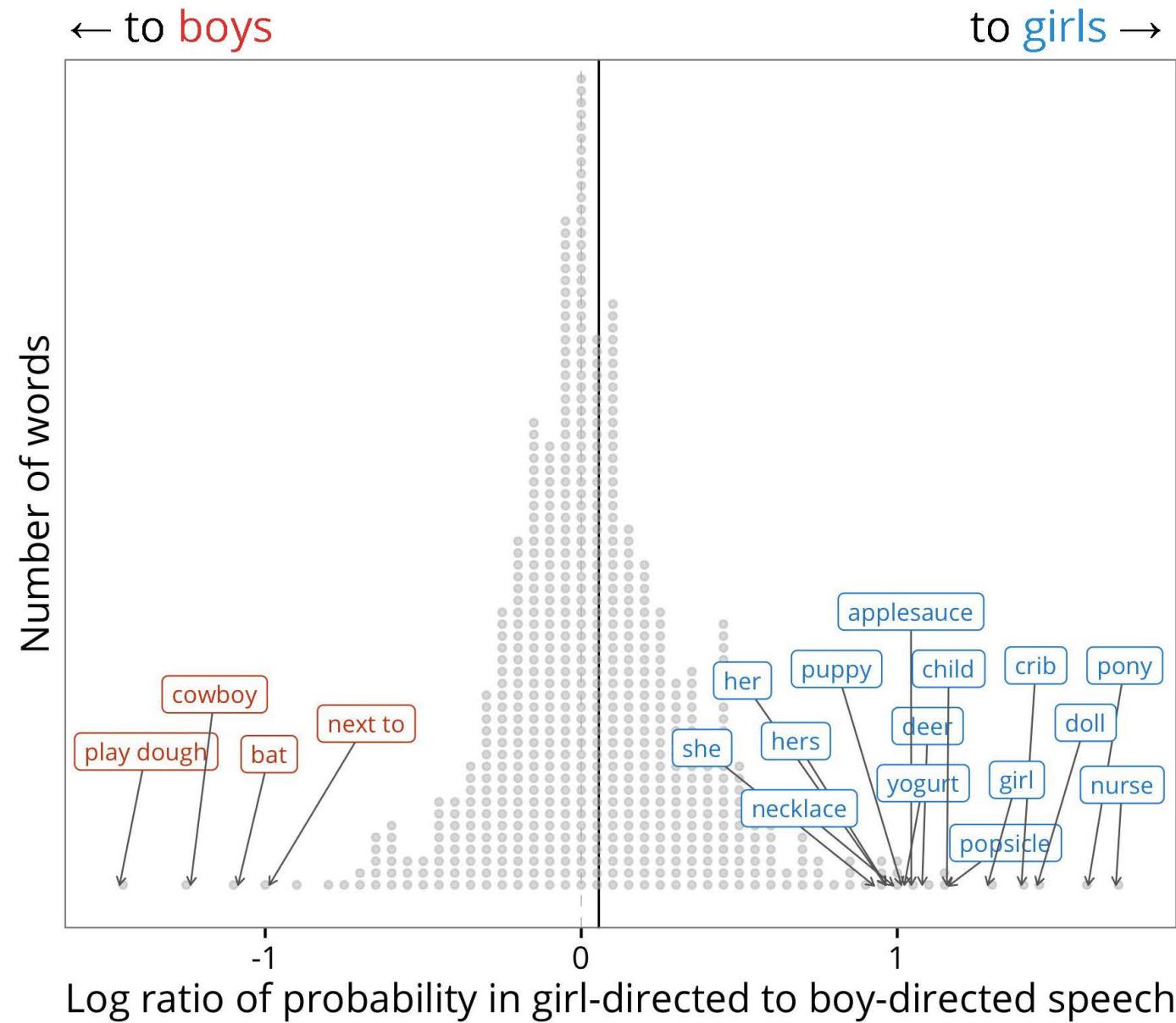
we can look at statistics in what parents say to kids...



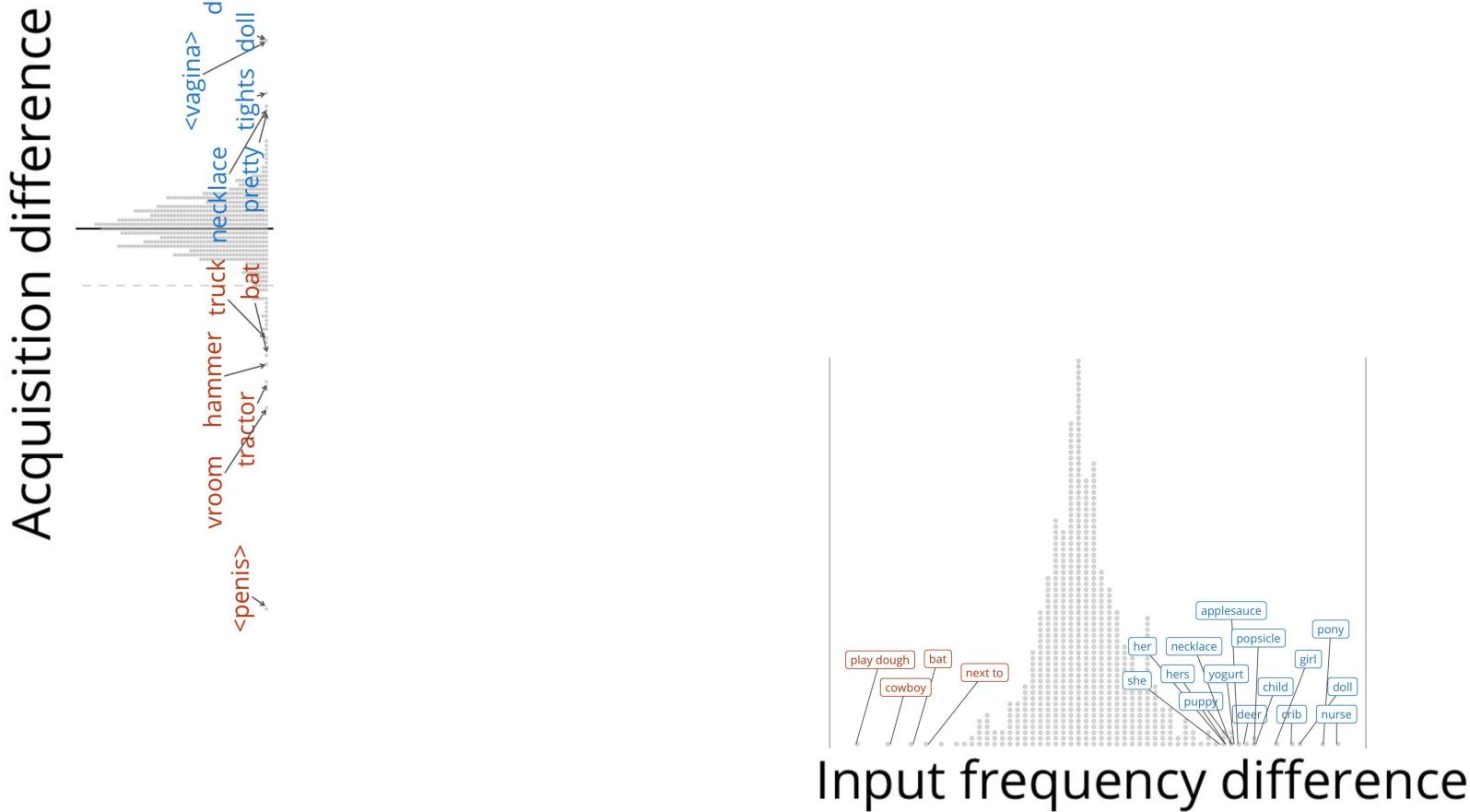
are there words **boys/girls** are more likely to hear?



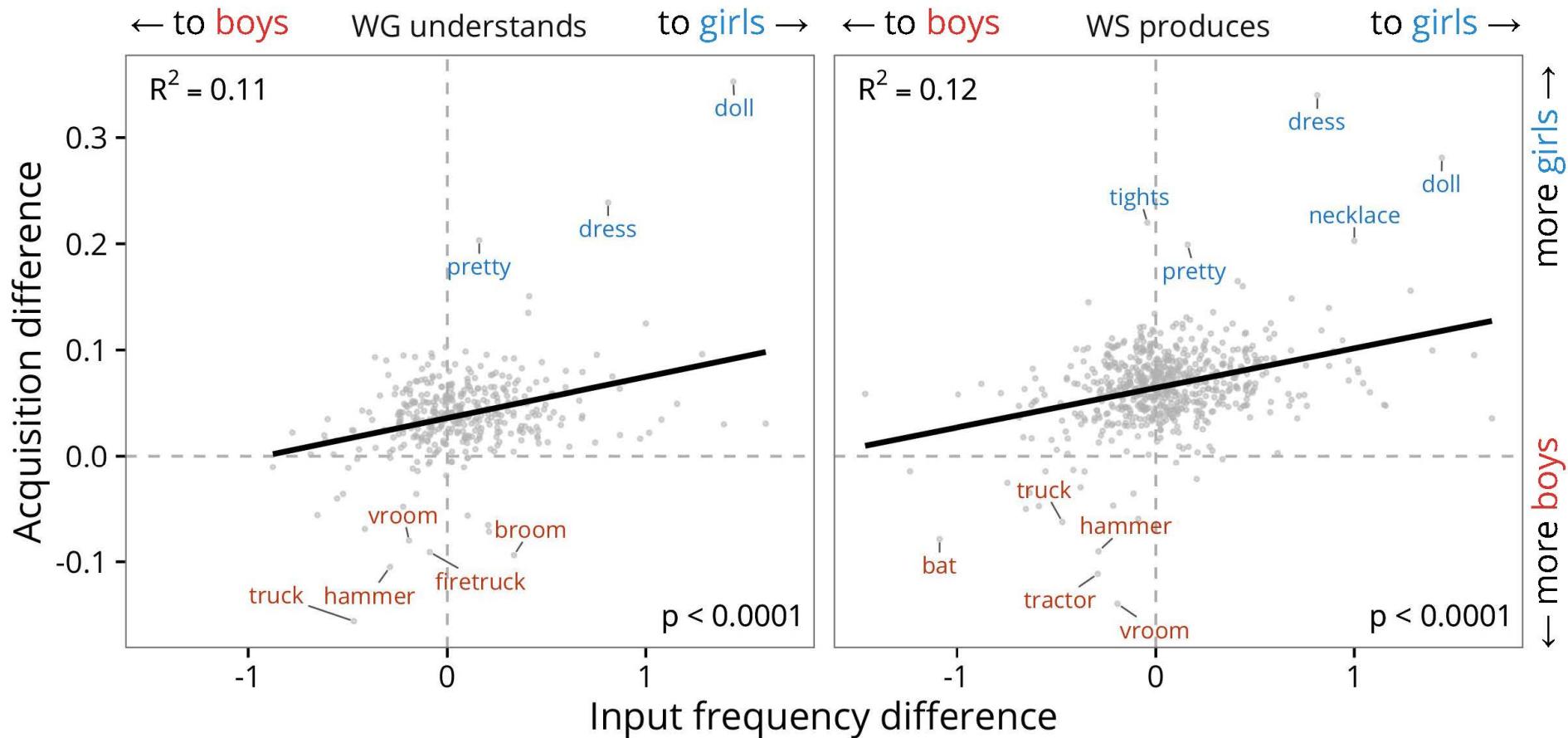
more child-related words to girls



do differences in parental speech explain gendered language outcomes?



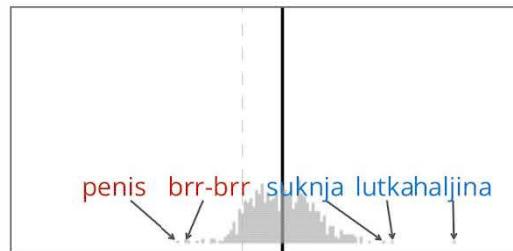
do differences in parental speech explain gendered language outcomes?



differences in words learned by **boys/girls** related to differences in speech they receive

just in english, or...?

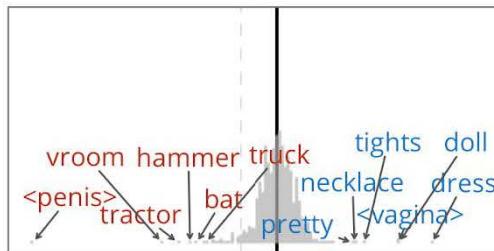
Croatian



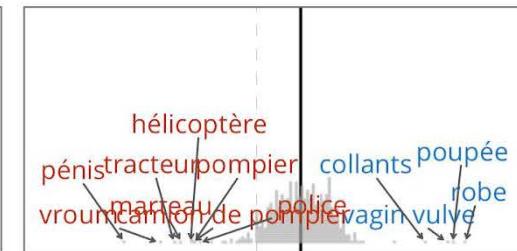
Danish



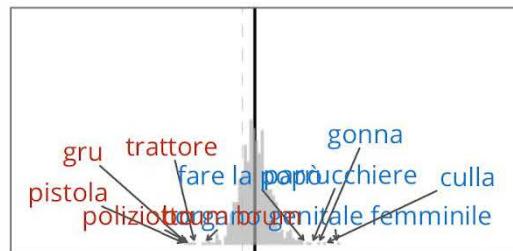
English



French (Quebec)



Italian



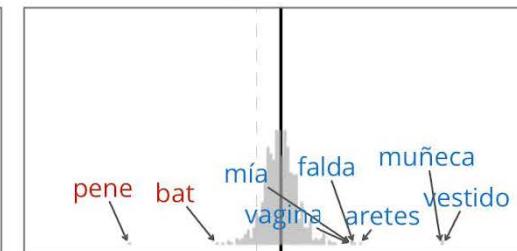
Norwegian



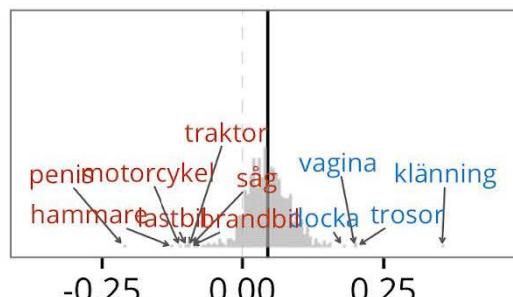
Russian



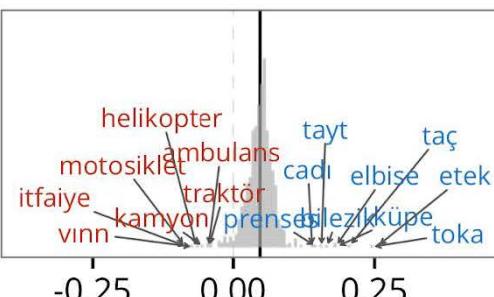
Spanish



Swedish



Turkish



Area between girls' and boys' acquisition trajectories

← more boys

more girls →

words acquired earlier by girls, crosslinguistically

dress	tights	dress	dress	vagina	dress	dress	dress	dress	skirt
doll	dress	doll	doll	crib	doll	daughter	doll	underpants	hairpin
skirt	doll	vagina	vagina	skirt	necklace	shoe	earrings	vagina	headband
stroller	vagina	tights	tights	hairdresser	purse	beads	skirt	doll	earrings
cry	necklace	necklace	necklace	go potty	potty	doll	mine	necklace	dress
pretty	underpants	pretty	underpants	necklace	pattycake	stroller	vagina	skirt	bracelet
plate	button	purse	girl	chips	brush	stroller	tights	shh	tights
comb	fine	underpants	purse	fawn	scarf	sweater	uncle	child's name	princess
handkerchief	go potty	girl	cheek	breast	bib	tissue	purse	button	naughty
paper	belly button	sweater	clean	doll	button	purse	necklace	butt	purse
Croatian	Danish	English	French (Quebec)	Italian	Norwegian	Russian	Spanish	Swedish	Turkish

girls > boys

what do you notice?

words acquired earlier by boys, crosslinguistically

penis	vroom	penis	penis	gun	vroom	firetruck	penis	penis	motorcycle
vroom	firetruck	vroom	vroom	crane	firetruck	truck	bat	hammer	firetruck
was	helicopter	tractor	tractor	police	firefighter	garage	helicopter	motorcycle	vroom
truck	penis	hammer	hammer	tractor	hammer	choo choo	truck	truck	helicopter
tractor	firefighter	bat	helicopter	vroom	tractor	vroom	airplane	tractor	truck
motorcycle	police	truck	firetruck	soldier	police	tractor	firetruck	firetruck	ambulance
peekaboo	hammer	firetruck	firefighter	jeep	motorcycle	son	tractor	saw	tractor
him	lawn mower	motorcycle	police	barber	helicopter	yucky	hammer	screwdriver	hammer
that	gas station	dump	nail	motorcycle	truck	caw	ox	helicopter	gun
about	tractor	police	lawn mower	penis	train	tick tock	police	nail	robot
Croatian	Danish	English	French (Quebec)	Italian	Norwegian	Russian	Spanish	Swedish	Turkish

boys > girls

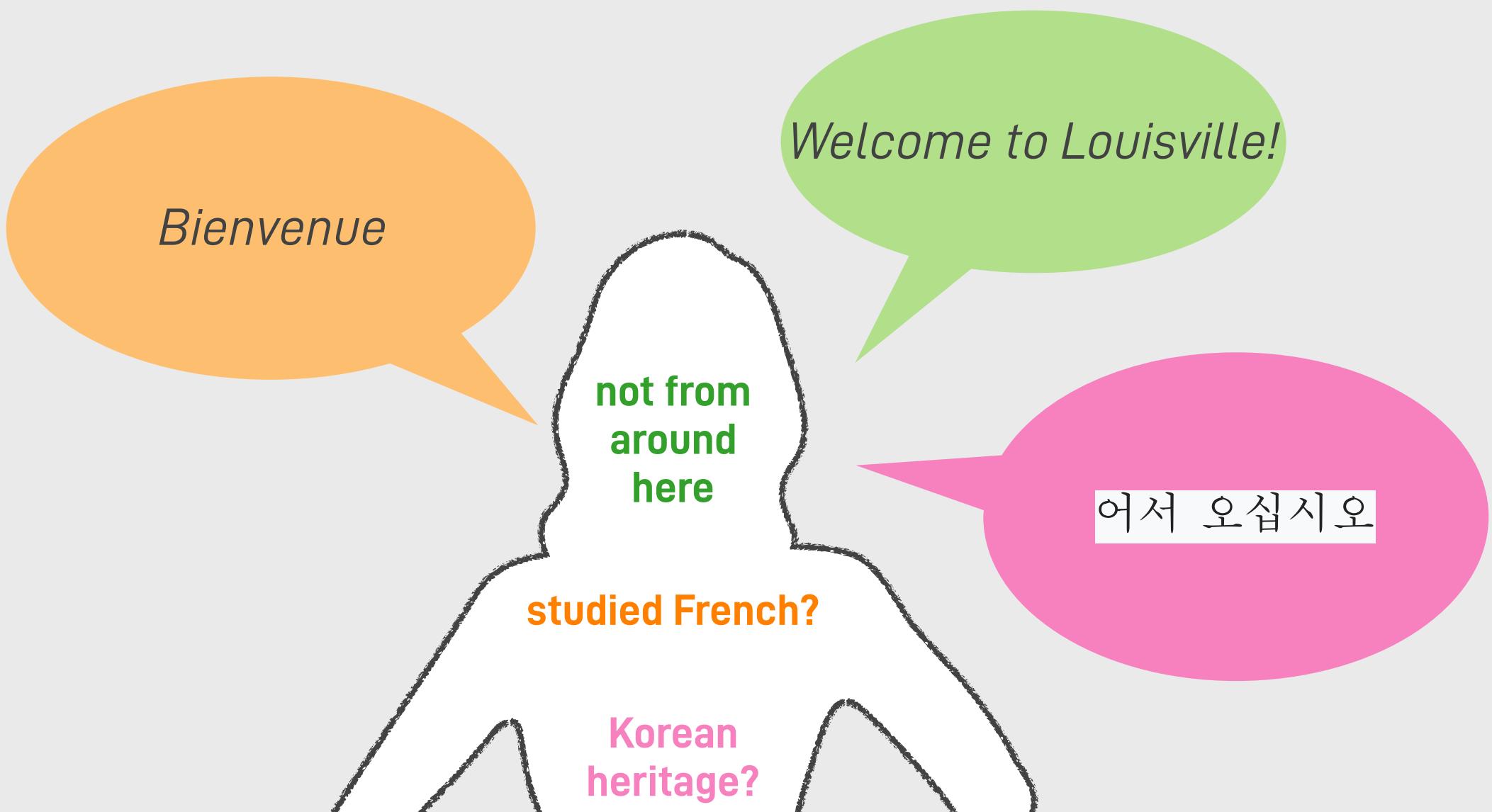
what do you notice?

language & social categorization

http://ucbpsych.qualtrics.com/jfe/form/SV_bk1JR9aNacmlhCB

There is reason to hypothesize that children may be predisposed to view the language and accent with which others speak as providing critical social grouping information. Throughout cognitive evolution, languages likely varied over small geographic space, thus differing accents and dialects may have served as valid pre-dictors of group membership throughout our evolutionary history (Baker, 2001), as they often do today (Henrich & Henrich, 2007). Moreover, natural selection may have favored social attention to accent in a way that it did not for race. Although modern societies are often racially stratified, and race can act as a reliable indicator of group membership today, neighboring groups of humans in ancient times did not likely look different in terms of physiognomy or skin color (Cosmides, Tooby, & Kurzban, 2003). Indeed, attention to race in adults can be “erased” in the face of contrasting information denoting coalitions along non-racial lines (Kurzban, Tooby, & Cosmides, 2001).

language tells us a lot about social group membership



do preverbal infants view language as a social category marker?

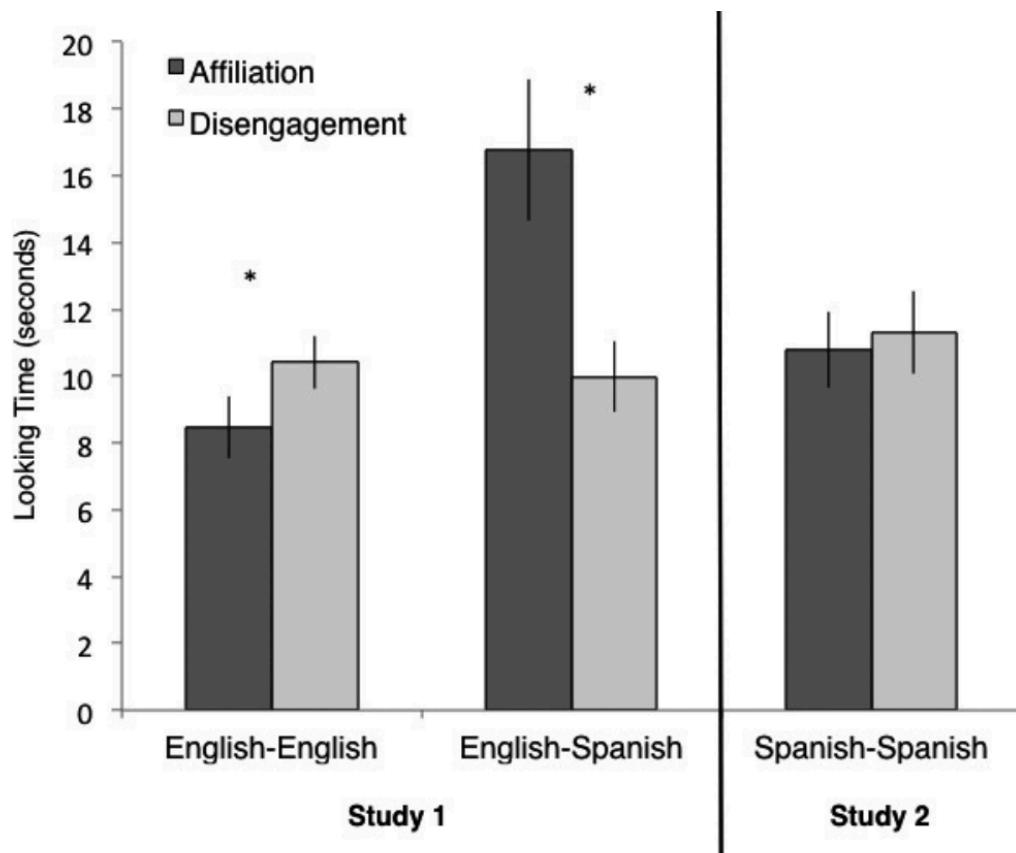
familiarization:



test:



do preverbal infants view language as a social category marker?

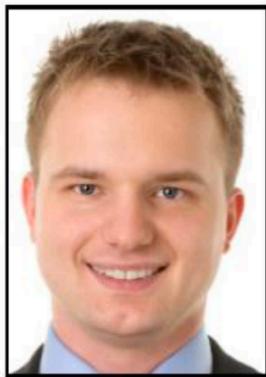


- 9-month-olds showed no expectation of the social relationship between two speakers of the same language
- ...but they were surprised when speakers of two different languages were buddy-buddy
- remember, the speakers did not interact during familiarization!

why do infants have such strong social expectations?

- preschoolers think an adopted child will grow up to speak the language of her biological parents, rather than her adopted ones (Hirschfeld & Gelman, 1997)

Il y a trois repas: le petit-déjeuner, le déjeuner, et le dîner.



There are three meals: breakfast, lunch, and dinner.



There are seven colors in the rainbow.

Lifespan task:

Which adult will this child grow up to be?

in the
absence
of specific
relevant experience,
children **essentialize**
language

Il y a trois repas: le petit-déjeuner, le déjeuner, et le dîner.



There are three meals: breakfast, lunch, and dinner.



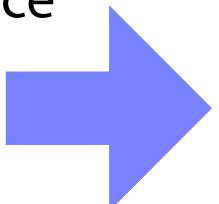
There are seven colors in the rainbow.

Which adult will this child grow up to be?

- Euro-American 5–6-year-olds choose language match
- African-American 5–6-year-olds choose race match
- Bilingual 5–6-year-olds choose language match
- Specifically French-English bilingual children choose race match

sociolinguistic development

social preference
and trust for
same-variant-
speakers

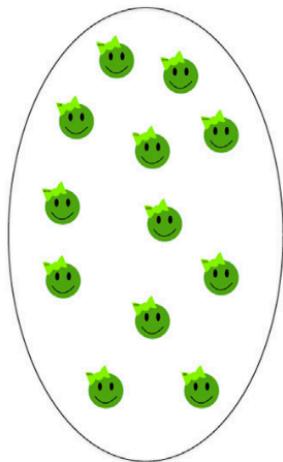


early language preferences

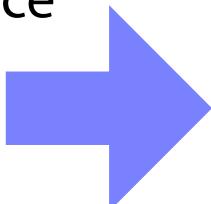
- 6-month-olds prefer to look at a video of a speaker who previously spoke to them in their native language, with a familiar accent, than to a video of someone who previously spoke a foreign language (Kinzler et al., 2007)
- 9—12-month-olds preferentially choose toys, food offered to them by familiar-dialect-speakers
- 14-month-olds & preschoolers selectively imitate native-accented speakers (Buttelmann et al., 2013)
- 2-year-olds associated a foreign language with someone if they had previously seen them doing something weird (e.g., combing hair with a fork; Oláh et al., 2014)



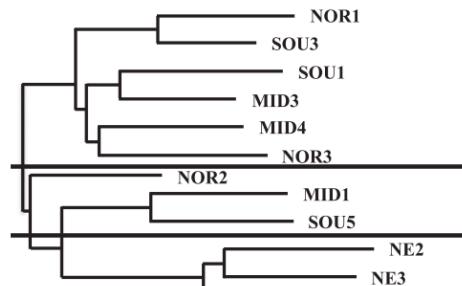
sociolinguistic development



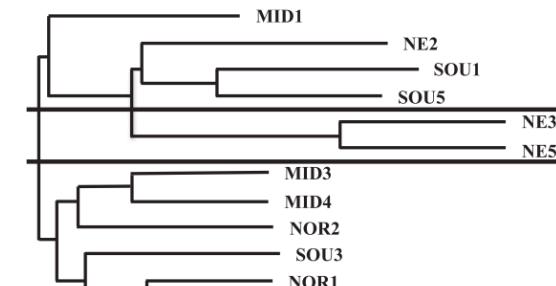
social preference
and trust for
same-variant-
speakers



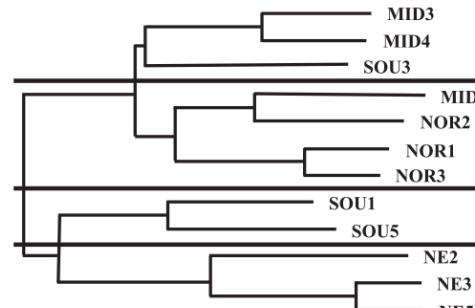
“like me” vs.
“not-like-me”
categorization &
overall positive
attitudes for
“like-me”



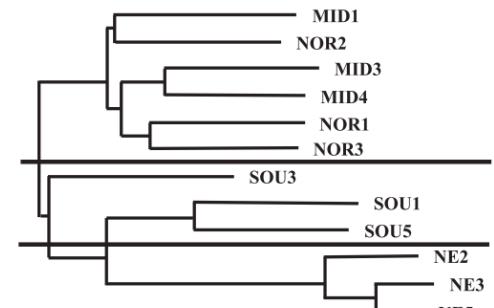
4- & 5-year-olds (N=40)



6- & 7-year-olds (N=44)

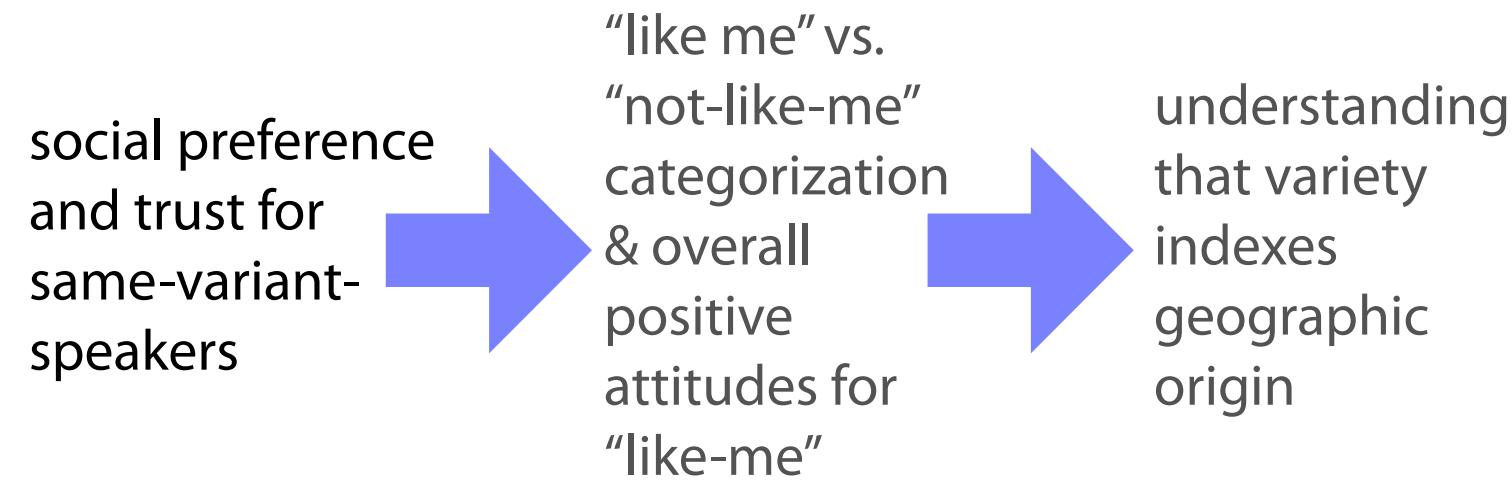


8- & 9-year-olds (N=45)

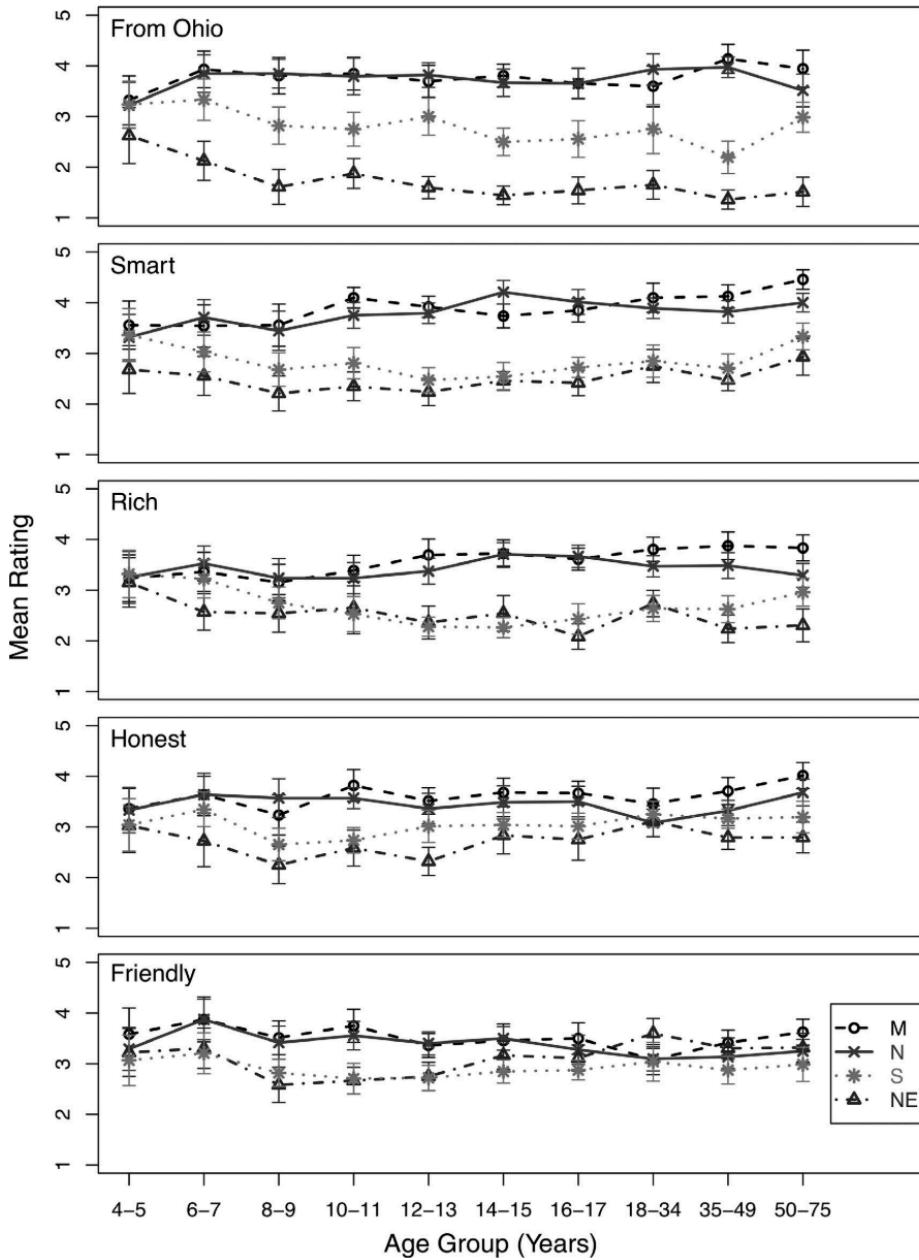


10- & 11-year-olds (N=41)

sociolinguistic development

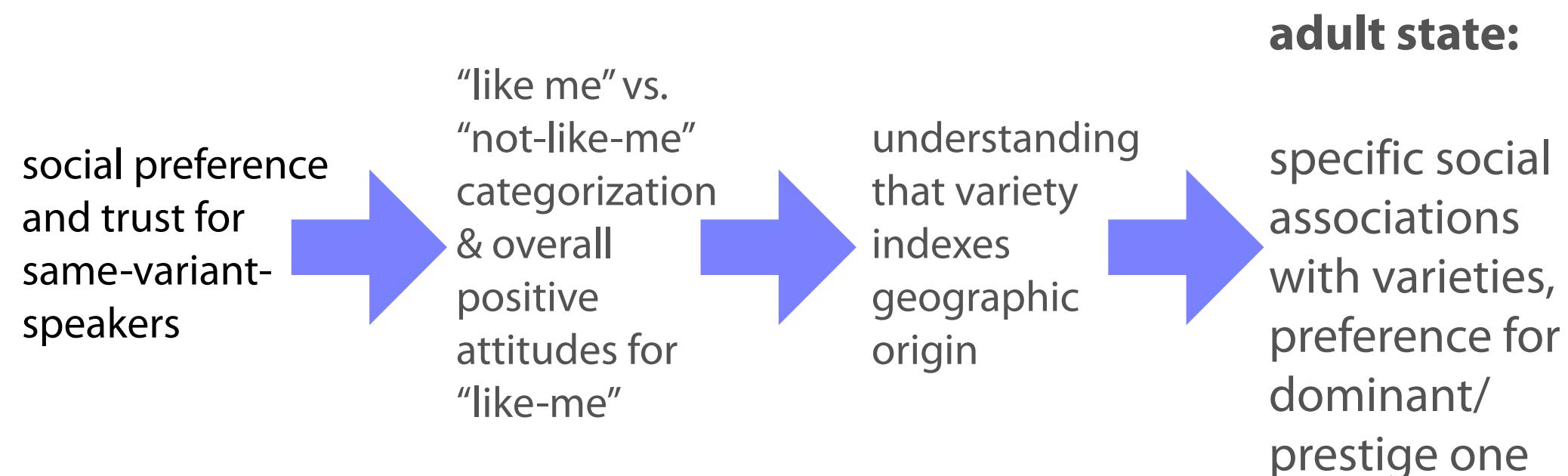


sociolinguistic development

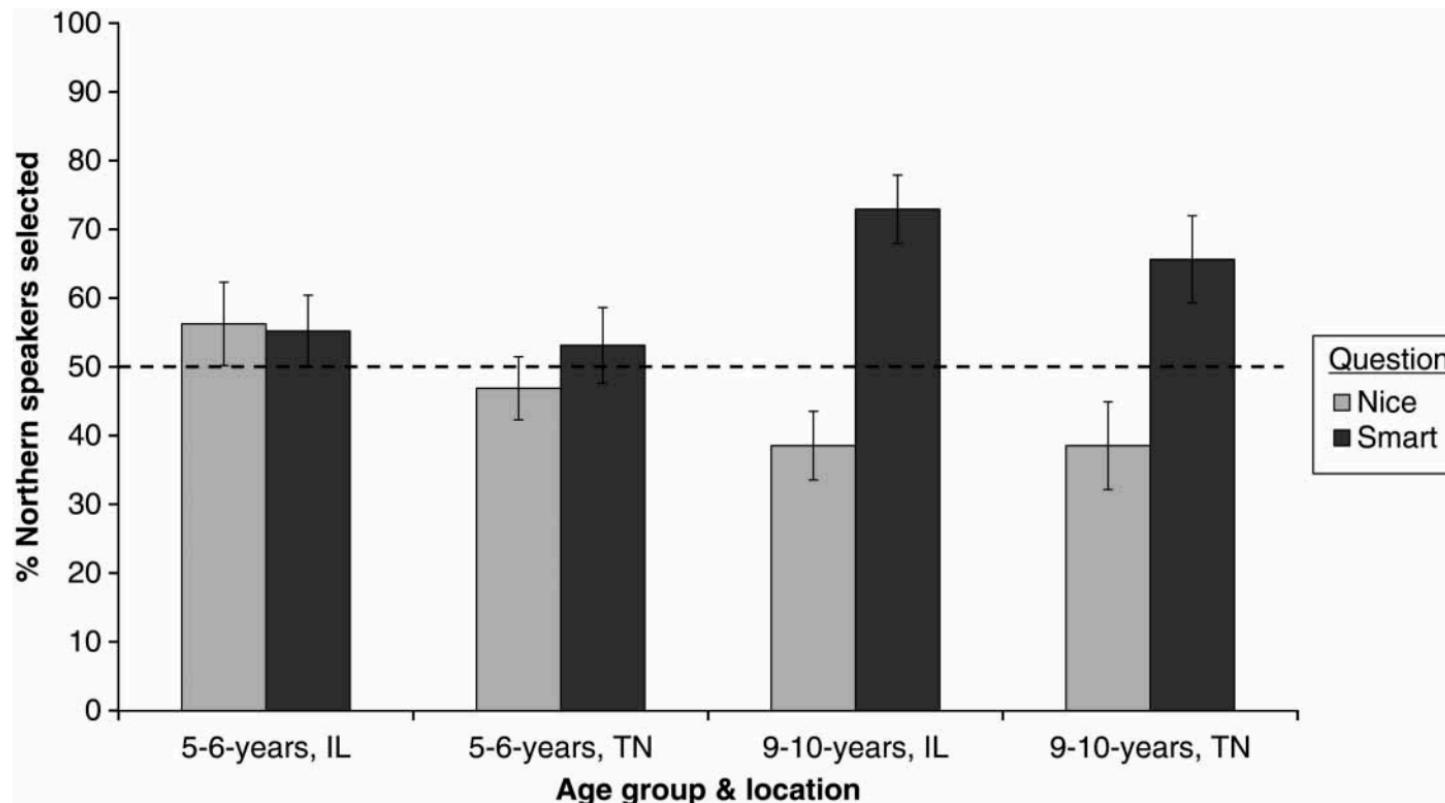


understanding
that variety
indexes
geographic
origin

sociolinguistic development



sociolinguistic development



adult state:

specific social associations with varieties, preference for dominant/prestige one

attention to language distinctions as socially important starts early

- infants prefer and preferentially trust same-variant speakers
- preschoolers expect unfamiliar language speakers to live in unfamiliar dwellings, wear unfamiliar garb
- in the absence of specific language experience, children tend to essentialize language
- increasing dialect discrimination, 7-16 years
- 9-10-year-olds evaluate Southern U.S. English speakers as *nice* and Northern U.S. English speakers as *smart*
- preference for dominant/prestige languages and variants

e.g., Hirschfeld & Gelman (1997), Jones et al. (2017), Weatherhead et al. (2018), Kinzler & DeJesus (2013), Byers-Heinlein & Garcia (2015)

where do these
associations come from?

where do these associations come from?

one place is children's media...

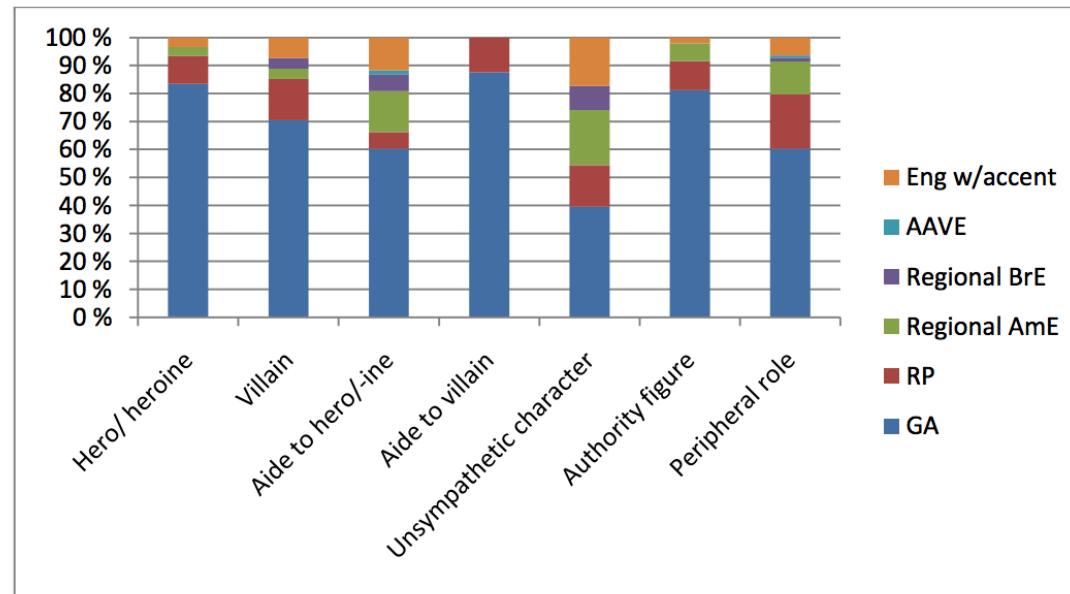
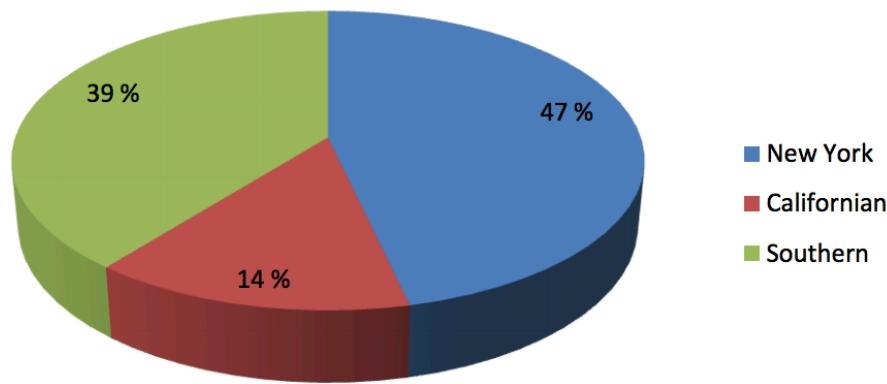


Figure 4.15. The distribution of accents among the different character roles

13. The distribution of regional American accents among the unsophisticated characters

A sophisticated character is one which is intelligent and socially apt. An unsophisticated character, on the other hand, is not very worldly or socially knowledgeable, and usually appears as less intelligent. The sophisticated characters are also usually of the more "serious" kind, whereas the unsophisticated characters often function as so called "comic reliefs" (Sonnesyn, 2011)

where do these associations come from?

one place is children's media...

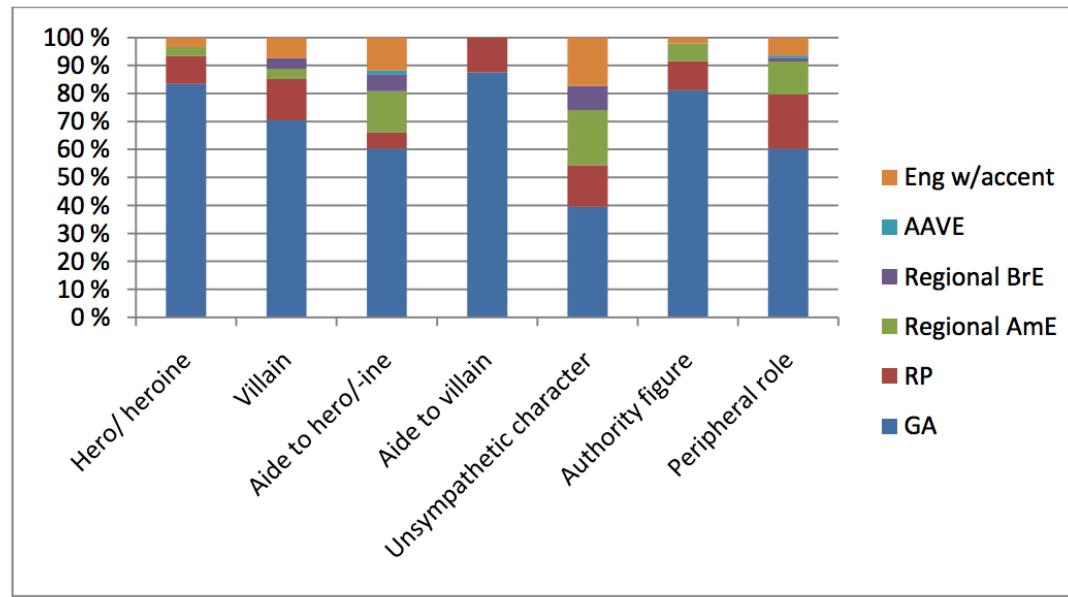
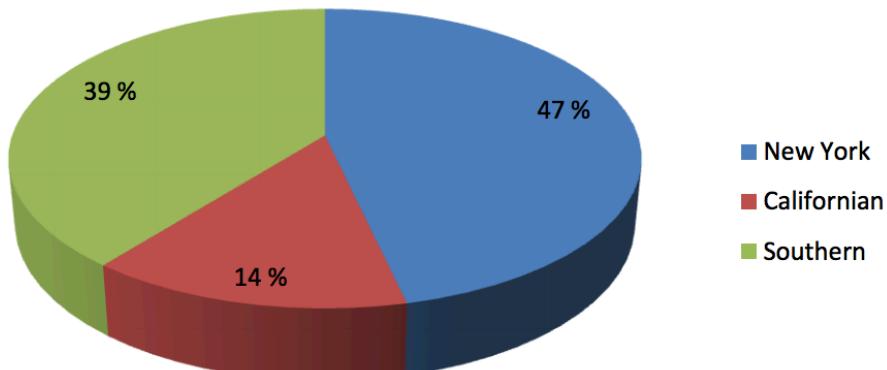


Figure 4.15. The distribution of accents among the different character roles

13. The distribution of regional American accents among the unsophisticated characters

but also us!!

— the accents we use for joke characters, etc...kids have associations with certain language varieties **before they have even met** native speakers of them! —> those biases can't have come from direct experience

can children use linguistic cues to *infer* what social categories are meaningful?



Children heard a 16-page storybook depicting diverse characters in different situations, narrated in 3 conditions:

Generic

Look at this Zarpie!
Zarpies are scared
of ladybugs

Specific

Look at this Zarpie!
This zarpie is scared
of ladybugs

No Label

Look at this one!
This one is scared of
ladybugs

can children use linguistic cues to *infer* what social categories are meaningful?



Generic

Look at this Zarpie!
Zarpies are scared
of ladybugs

...

DAYS LATER,

Children were more likely to essentialize Zarpies when previously introduced to them using **generic** language



Specific

Look at this Zarpie!
This zarpie is scared
of ladybugs

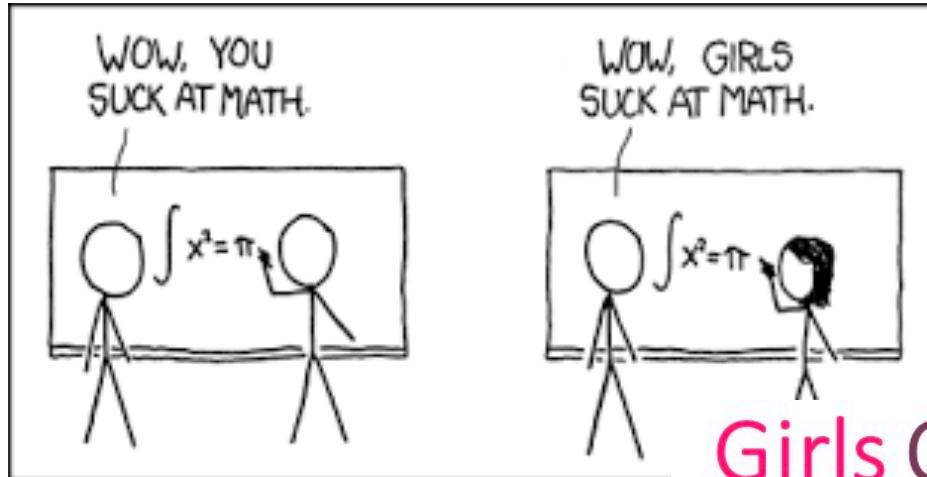


No Label

Look at this one!
This one is scared of
ladybugs

Rhodes (2012)

so what if children essentialize in response to generic language?



generic language implies that a social category is homogenous

Girls Can Do Science Too!

Curriculum, Resources, & Tools

& young children can “read between the lines” to infer biases and socially-transmitted generalizations embedded in language



a lot of well-intentioned media might be licensing unintended inferences that even preschoolers can pick up on...

Girls Can Do Science Too!

= girls are a (homogenous) group that you can generalize across



a lot of well-intentioned media might be licensing unintended inferences that even preschoolers can pick up on...

Girls Can Do Science Too!

= this is surprising, so some other, contrasting group must be the default where it's expected?



pragmatic development

pragmatic inference in practice: responses to *why* questions

- studies of parents' causal explanations to children's questions
- for some questions, parents give highly informative answers, with (their best efforts at) at causal mechanistic explanations

CHILD: *Why does the moon grow?*

PARENT: *The earth is blocking it. It's a shadow so it gets bigger and bigger*
(gestures)

CHILD: *What's a crystal?*

PARENT: *It's kind of a rock that kinda grows. It doesn't really grow because it's not alive, but it grows because it adds more and more of the rock to it*

Child: [age three years, 11 months] *Where is my brain?*
Father: *Here.* [Pointing to her head.]
Child: *Why is there a bone in my head?*
Father: *Because your brain is an important organ and your skull protects it.*
Child: *Why is it important?*
Father: *Because it helps you think and become intelligent.*
Child: *If my brain gets hurt I won't be intelligent?*
Father: *No, if your brain gets hurt you won't be intelligent like you are now.*

pragmatic inference in practice: responses to *why* questions

- but for other questions, parents reliably give non-causal explanations

Parents' responses were coded into four categories:

Causal, including causal mechanism, e.g., "He got hurt because he was hit by a car," as well as causal outcome, e.g., "You have a mouth so you can eat."

Religious, e.g., "God made it that way."

Unexplained essence, e.g., "That's how ducks are made."

Non-causal, e.g., in answer to "How are babies born?" the response was "The baby is in my stomach."

CHILD: Where do babies come from?

PARENT: Remember when we grew watermelons?

Niña: *¿Por qué cuando una persona está en la panza de la otra el bebé se hace una bolita?*
Madre: *Porque los bebés son chiquitos y la panza de la mamá es aún más chiquita, y por eso se hace una bolita.*

CHILD: Where do babies come from?

PARENT: You don't need to know about that now.

CHILD: How are babies born?

PARENT: The baby is in my stomach.

→ communicating taboos?

- the differential quality of adults' explanations to children's questions may provide evidence for

In addition to providing information about science, parents may also be guiding children's understanding of scientific domains by communicating to them evaluations about what kinds of things are important to know. In Goodnow's (1990) provocative discussion about the socialization of cognition, she suggests that researchers need to attend more to the subtle messages available to children regarding what are the appropriate and inappropriate things for them to know about. In responding to children's questions about birth, parents seemed to give the indirect message that children should not know much about this topic. When answering anatomy questions, however, parents seemed quite intent on having their children understand something about the process of human growth and development.

what else might children be learning via inference? the case of generic language



Children heard a 16-page storybook depicting diverse characters in different situations, narrated in 3 conditions:

Generic

*Look at this Zarpie!
Zarpies are scared
of ladybugs*

Specific

*Look at this Zarpie!
This zarpie is scared
of ladybugs*

No Label

*Look at this one!
This one is scared of
ladybugs*

can children use linguistic cues to infer what social categories are meaningful?



Generic

Look at this Zarpie!
Zarpies are scared
of ladybugs

...

DAYS LATER,

Children were more likely to essentialize Zarpies when previously introduced to them using **generic** language

Specific

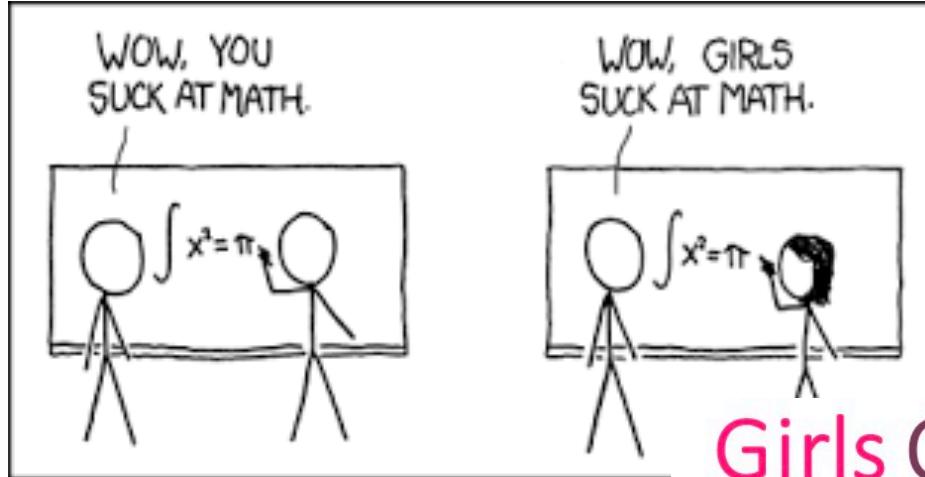
Look at this Zarpie!
This zarpie is scared
of ladybugs

No Label

Look at this one!
This one is scared of
ladybugs

Rhodes (2012)

so what if children essentialize in response to generic language?



generic language implies that the social category is homogenous

Girls Can Do Science Too!

Curriculum, Resources, & Tools

young children can "read between the lines" to infer biases and socially-transmitted generalizations embedded in language



BLACK GIRLS CAN SCIENCE TOO!

well, a lot of well-intentioned media might be licensing unintended inferences that even preschoolers can pick up on...

Girls Can Do Science Too!

= girls are a (homogenous) group that you can generalize across



well, a lot of well-intentioned media might be licensing unintended inferences that even preschoolers can pick up on...

Girls Can Do Science Too!

= this is surprising, so some other, contrasting group must be the default where it's expected?

