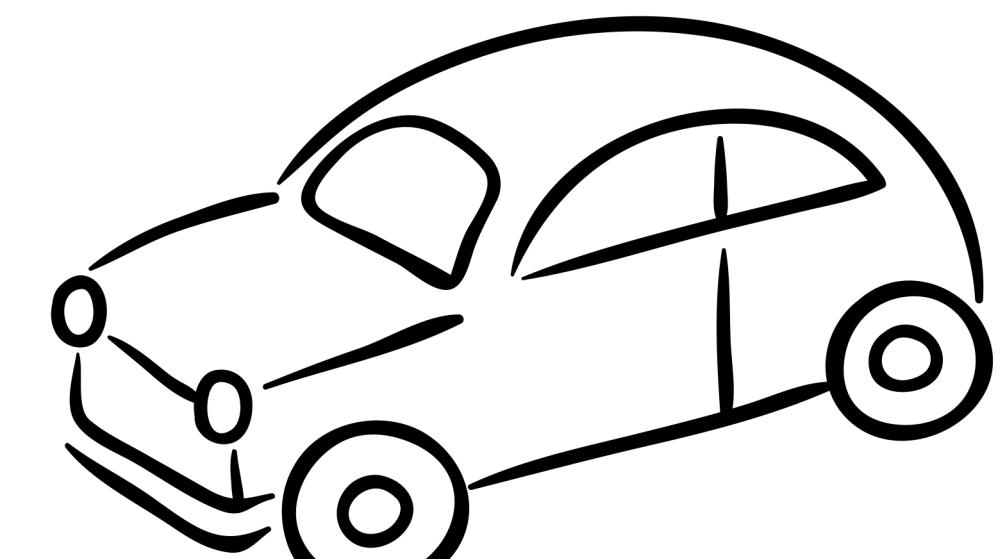
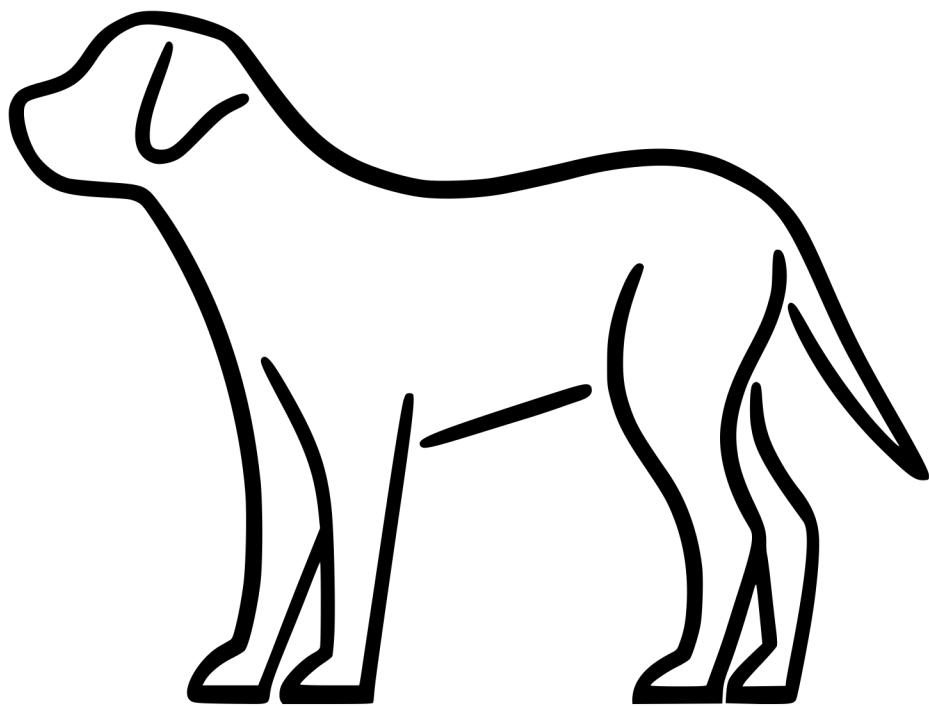
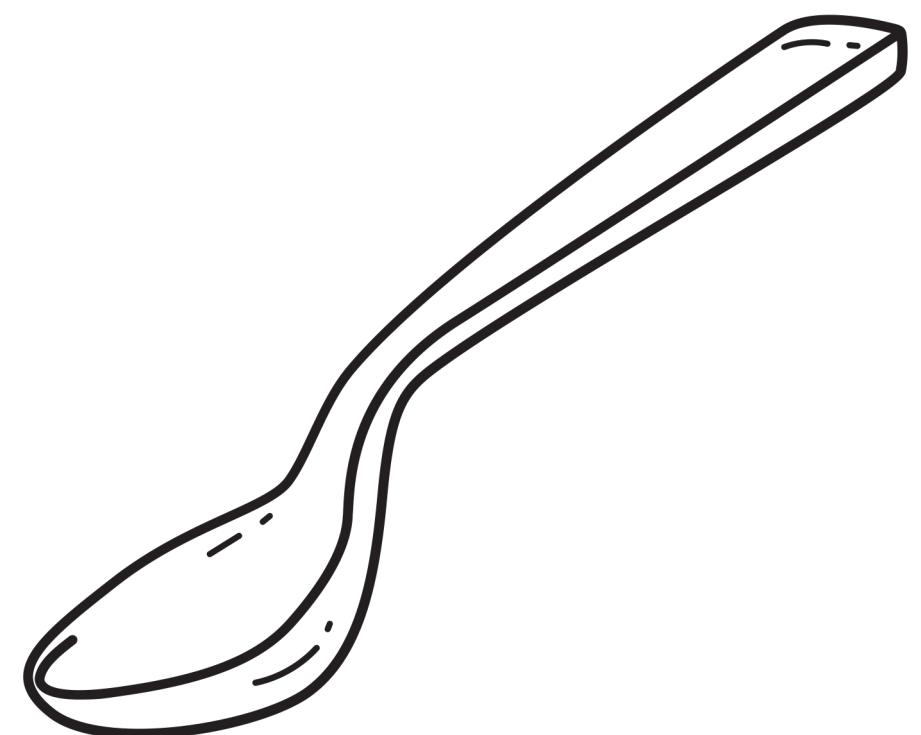
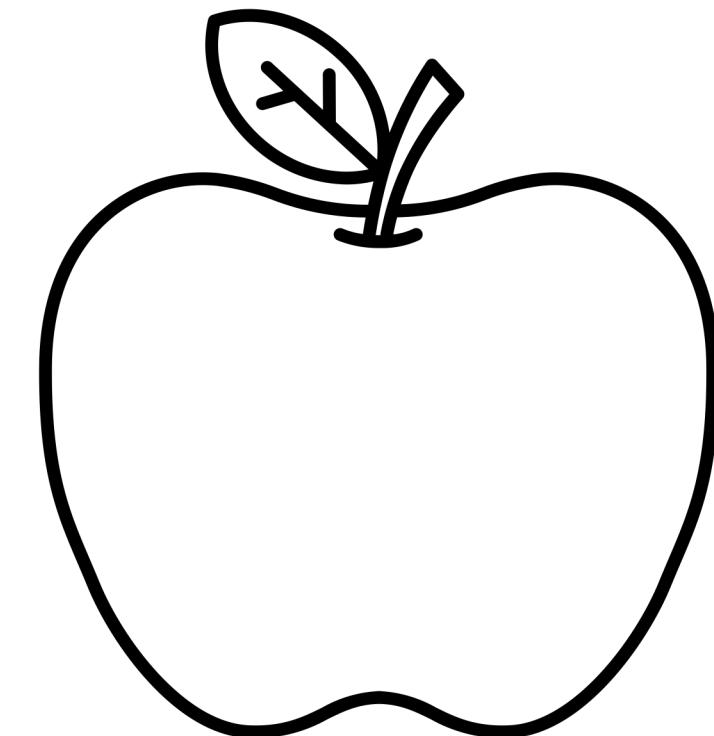
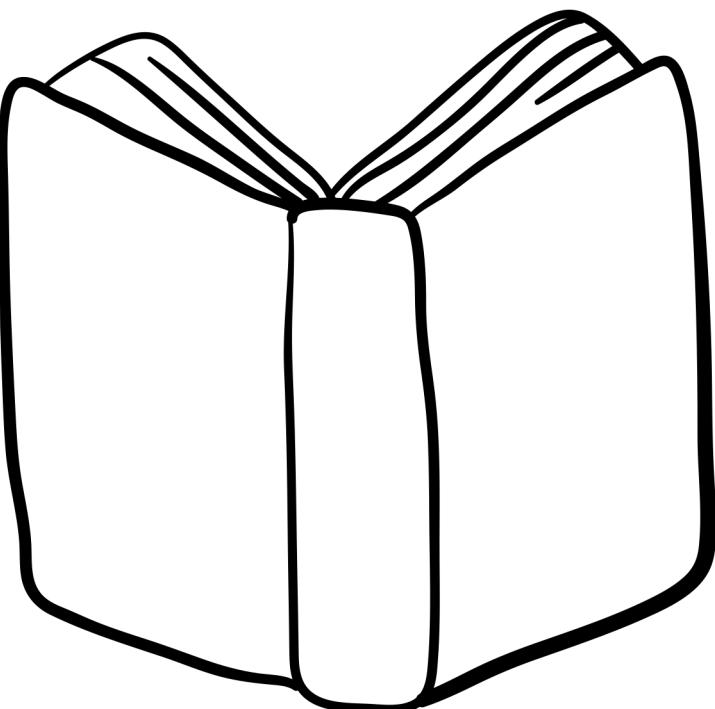
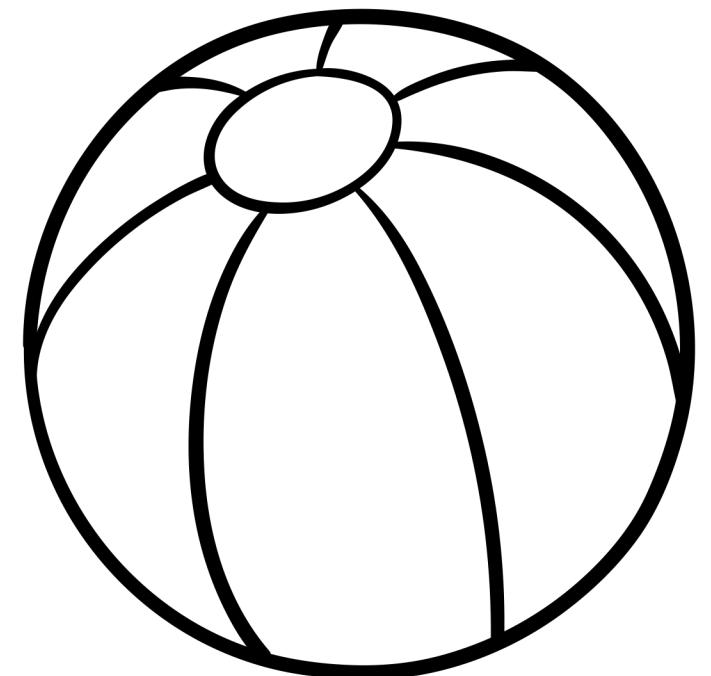


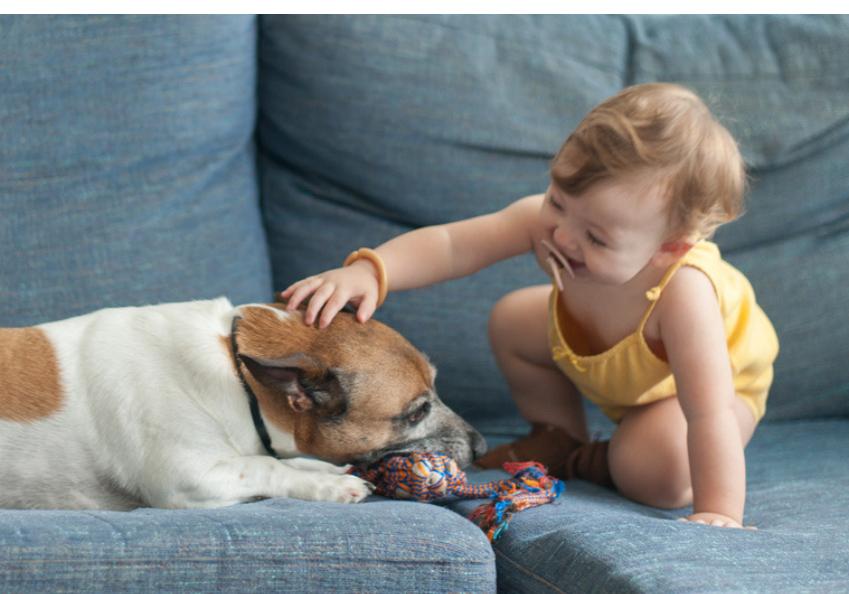
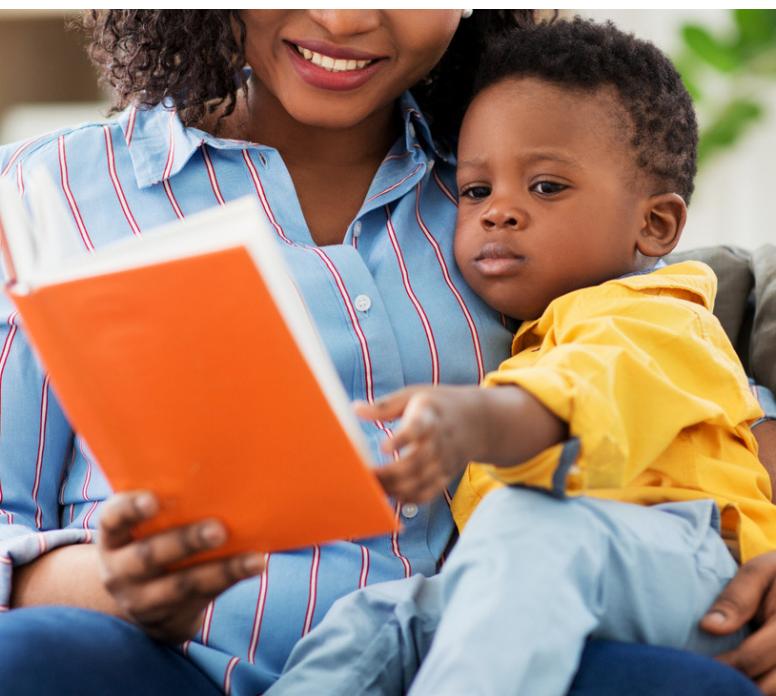
# OBJECT HANDLING PREDICTS AGE OF NOUN ACQUISITION IN A TSELTAL MAYAN COMMUNITY

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Kennedy Casey  
Princeton University

Marisa Casillas  
University of Chicago





e.g., Casey, Bergelson, Casillas, et al., *in prep*; Herzberg et al., 2022

**OBJECT HANDLING**



**WORD LEARNING**

>2.5 times more likely to understand and say words for objects that they manipulated

*Suarez-Rivera et al., 2022*

Body-object interaction ratings predict AoA

*Muraki et al., 2022*

Object handling leads to visual dominance of target objects and greater novel word learning success

*e.g., Schroer & Yu, 2023; Yu et al., 2009; Yu & Smith, 2012*

**OBJECT HANDLING**



**WORD LEARNING**

# FOCUS ON CHILD NOT CAREGIVER HANDS

More dominant in visual field

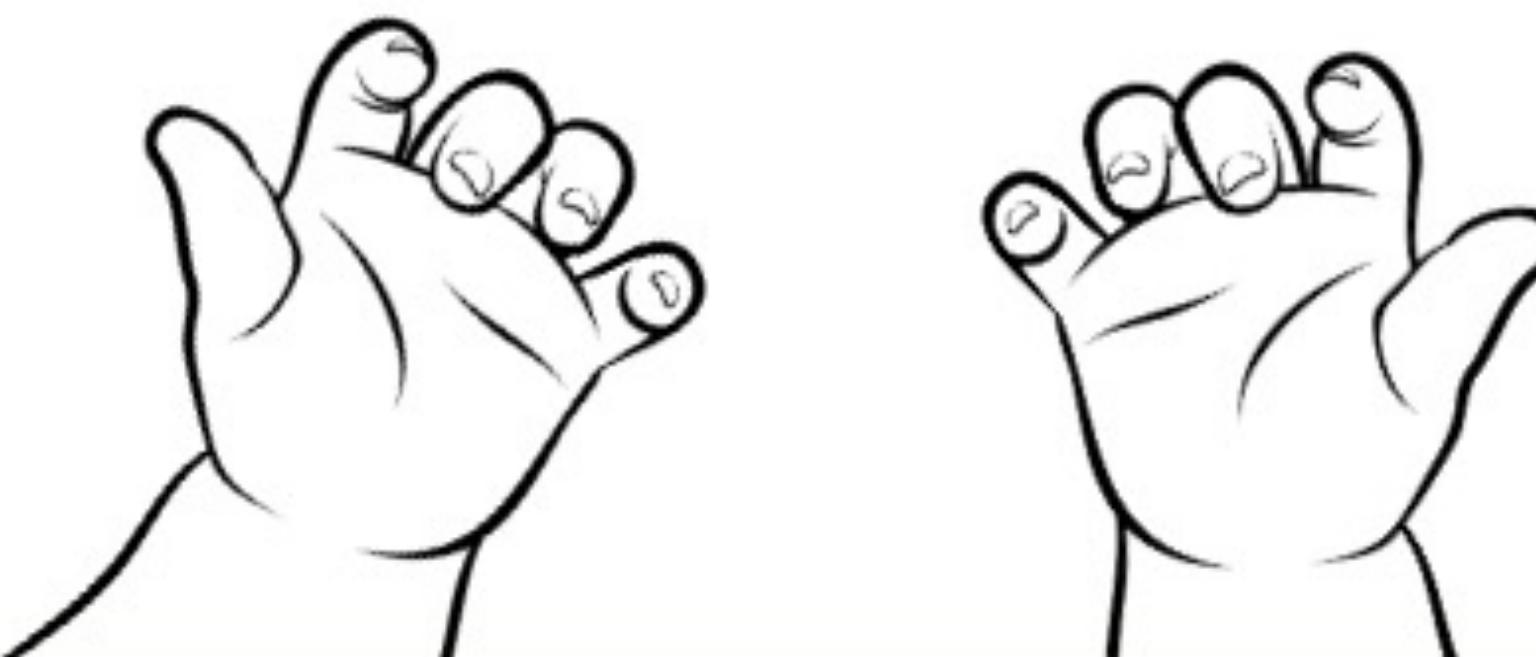
More diverse viewing opportunities

More robust object memory and word learning

**OBJECT HANDLING**



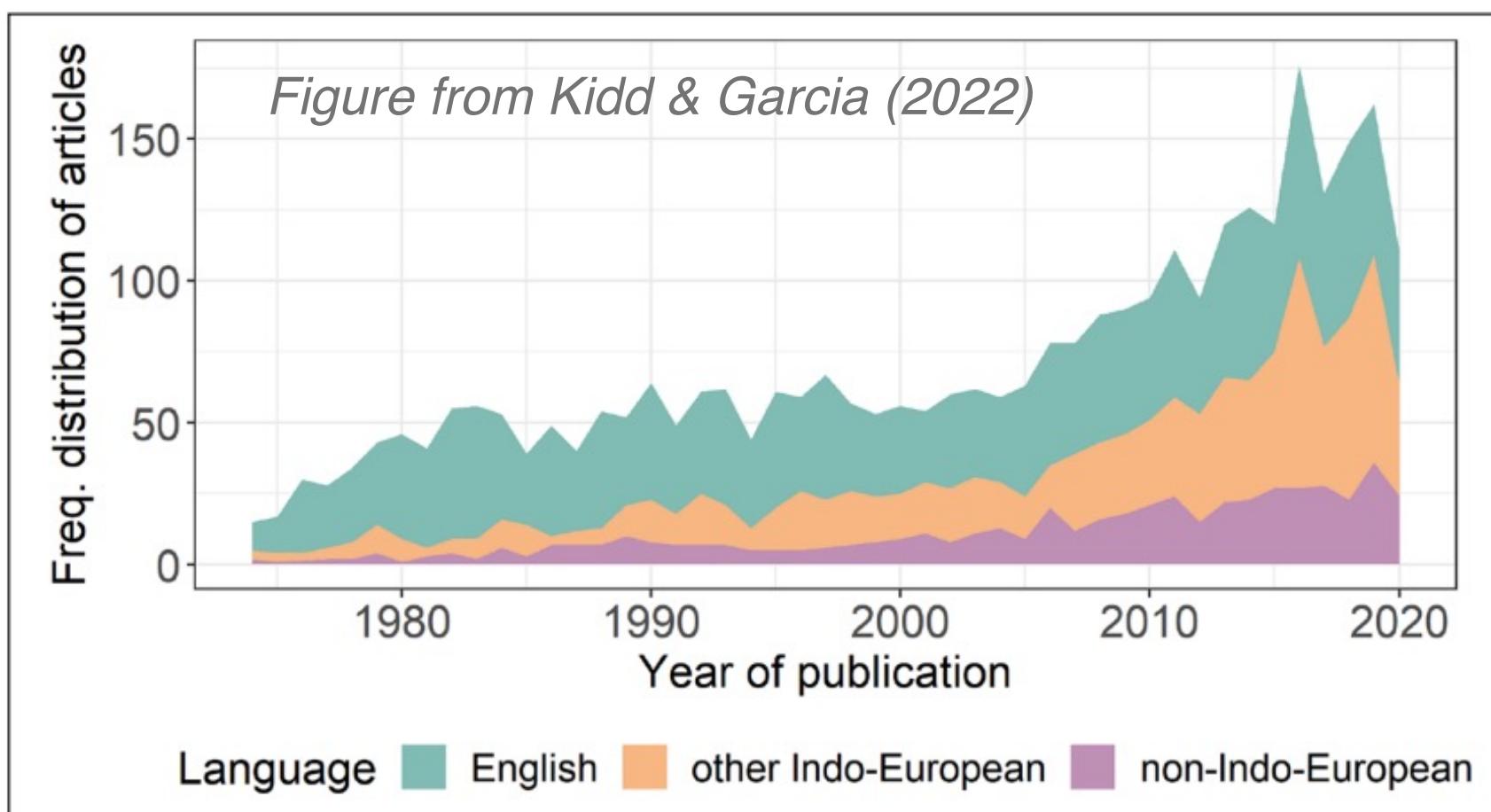
**WORD LEARNING**



Bambach *et al.*, 2018; Clerkin & Smith, 2022;  
Slone *et al.*, 2019; Yu & Smith, 2012; Yurovsky *et al.*, 2013

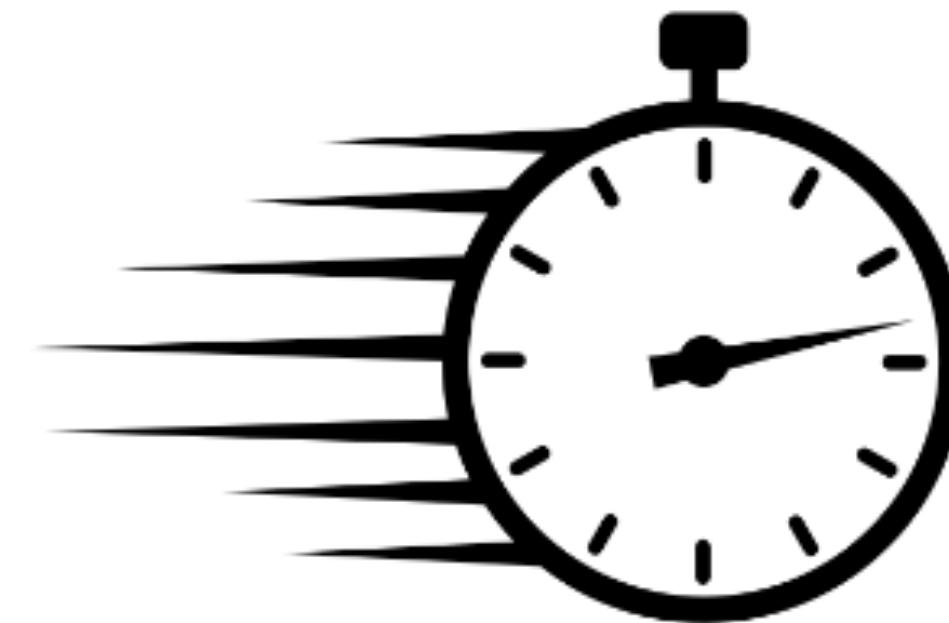
# NEED FOR REPRESENTATIVE SAMPLES AND TIMESCALES

## Lack of cultural and linguistic variation



**Figure 1.** Frequency Distribution of Articles on English, other Indo-European Languages and Non-Indo-European Languages Published in Child Language Journals Between 1974 and 2020.

## Short recordings



See exceptions: Karasik et al., 2018; Koşkulu et al., 2021

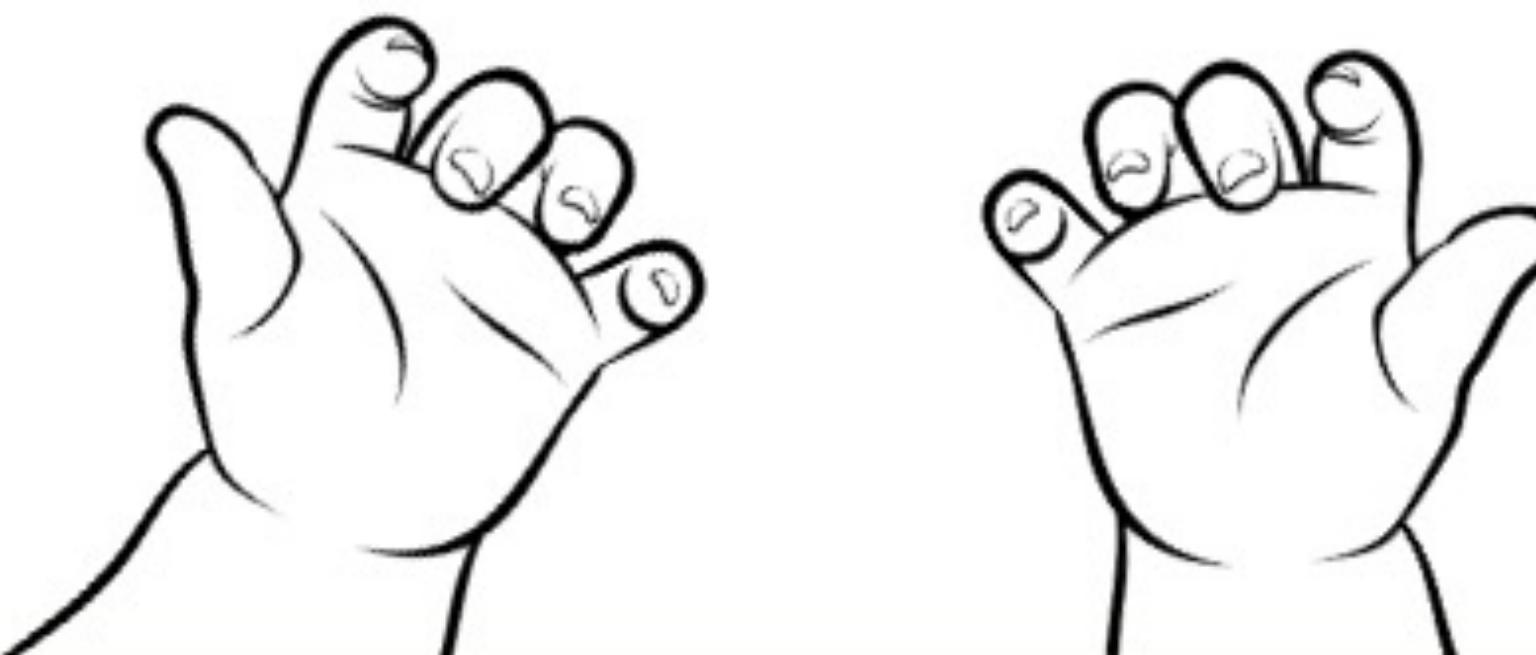
See exceptions (visually present objects):  
Bergelson et al., 2019; Long et al., 2021

# DAYLONG OBJECT HANDLING PATTERNS IN A TSELTAL (MAYAN) COMMUNITY

OBJECT HANDLING



WORD LEARNING



# DAYLONG OBJECT HANDLING PATTERNS IN A TSELTAL (MAYAN) COMMUNITY

“Non-child-centered” rearing context

*Brown, 2011; Brown & Casillas, 2021; Casillas et al., 2020; de León, 1999, 2001*

Dampened object noun salience (interactionally and linguistically)

*Brown, 2008, 2011, 2014; Brown & Casillas, 2021; Casillas et al., 2024; de León, IASCL 2024*

Infant carrying practices

*Brown, 2011; Brown & Casillas, 2021*

Availability of different object types

*Arnold et al., 2012; Casey et al., 2022; Herzberg et al., 2022; Swirbul et al., 2022*



# DAYLONG OBJECT HANDLING PATTERNS IN A TSELTAL (MAYAN) COMMUNITY

## DAYLONG PHOTO STREAMS

**Q1:** What are the characteristics of Tseltal children's **object handling**?

## VOCABULARY CHECKLISTS

**Q2:** How does **object handling** relate to word learning in Tseltal?

**Q1: What are the characteristics of Tseltal  
children's object handling?**

# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1  
camera



Photojojo “super”  
fisheye lens  
(180° view)



*Image from Casillas & Casey (2024)*

*Casillas HomeBank Corpus (2017)*



## ***photo stream***

~9 recorded hours

2 photos per minute



**35moF**

\*rotated 90° for presentation

Casillas HomeBank Corpus (2017)

# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1  
camera



Photojojo “super”  
fisheye lens  
(180° view)



35moF

# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1  
camera



Photojojo “super”  
fisheye lens  
(180° view)

**N:** 38 children

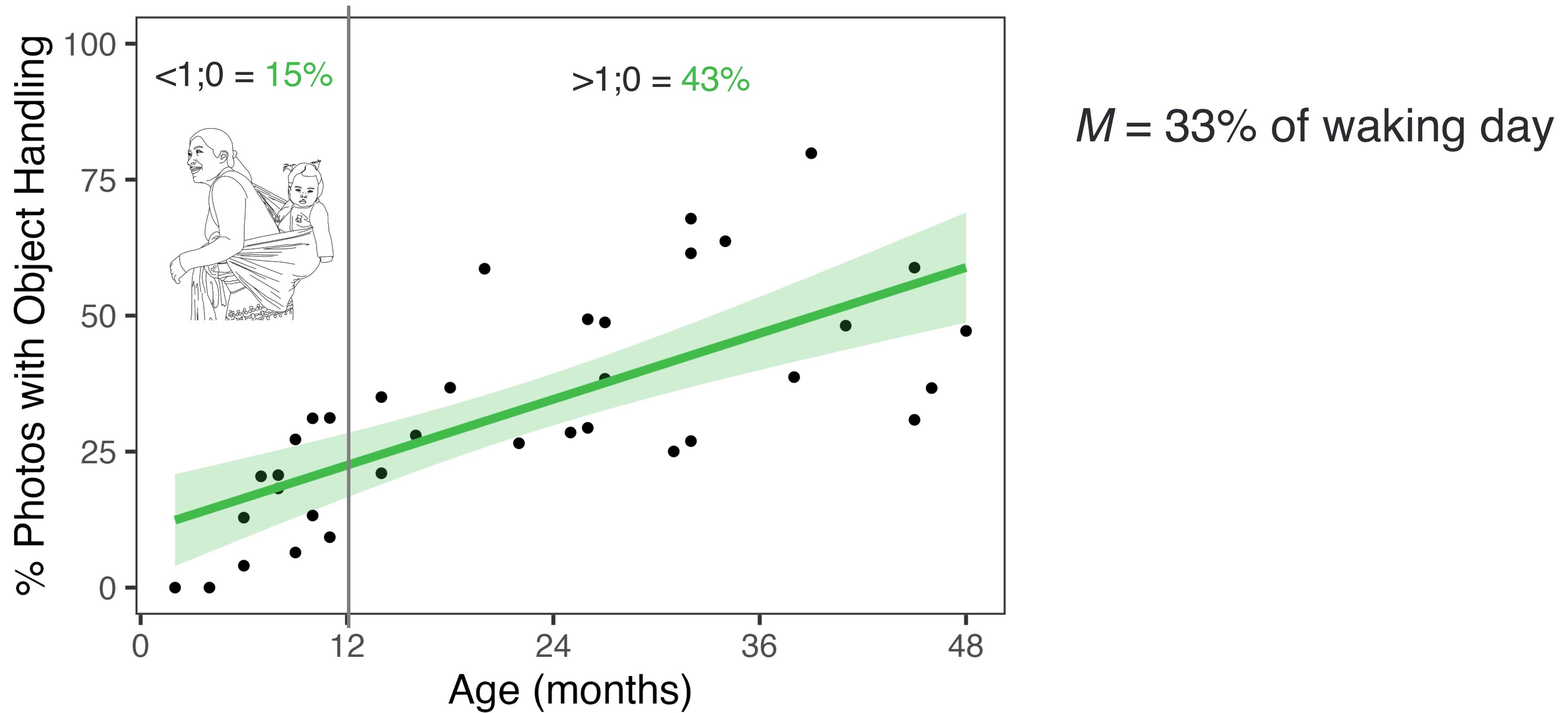
**Age range:** 2–48 months ( $M = 21$ )

2 photos per minute

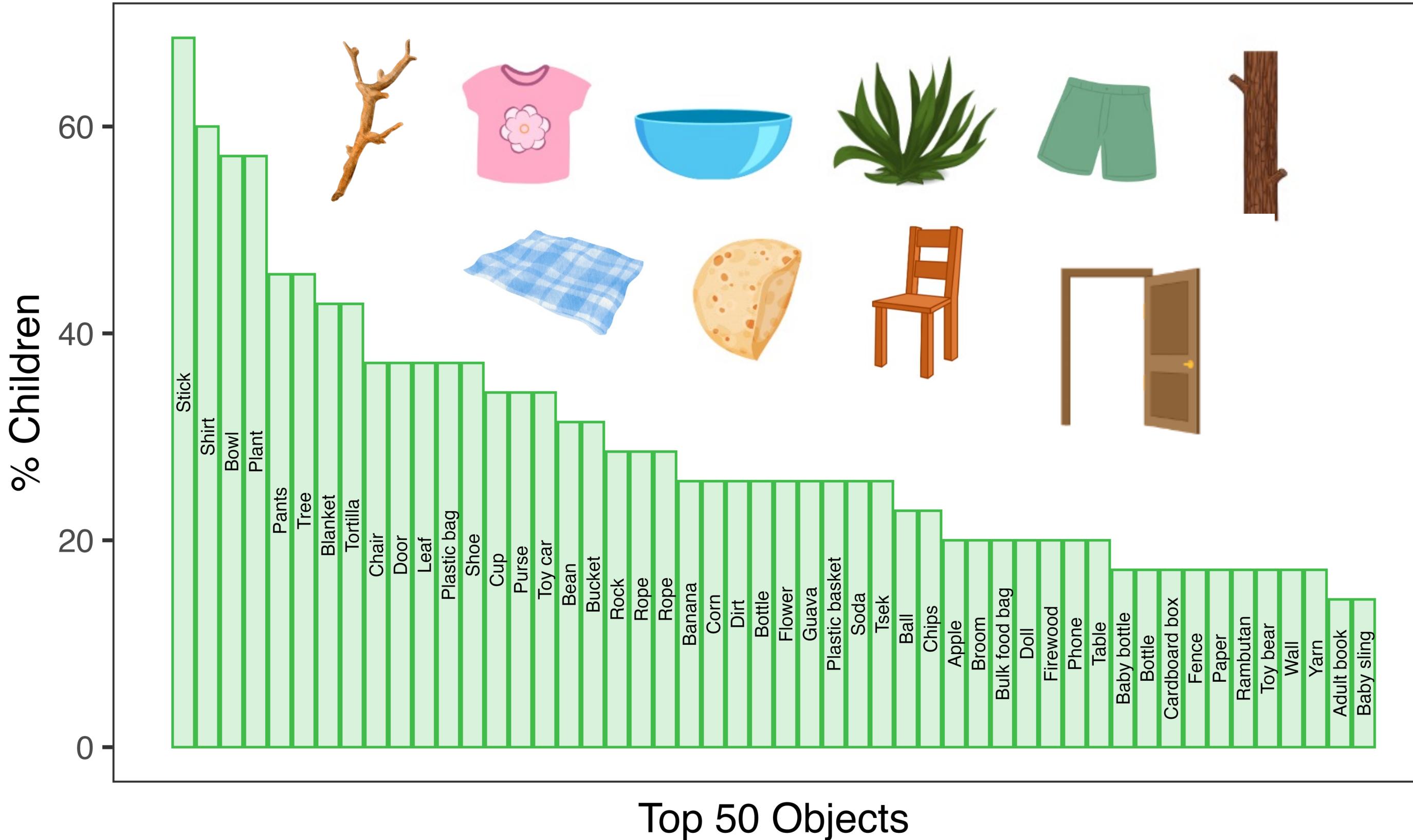
~9 recorded hours per child

>40k total photos

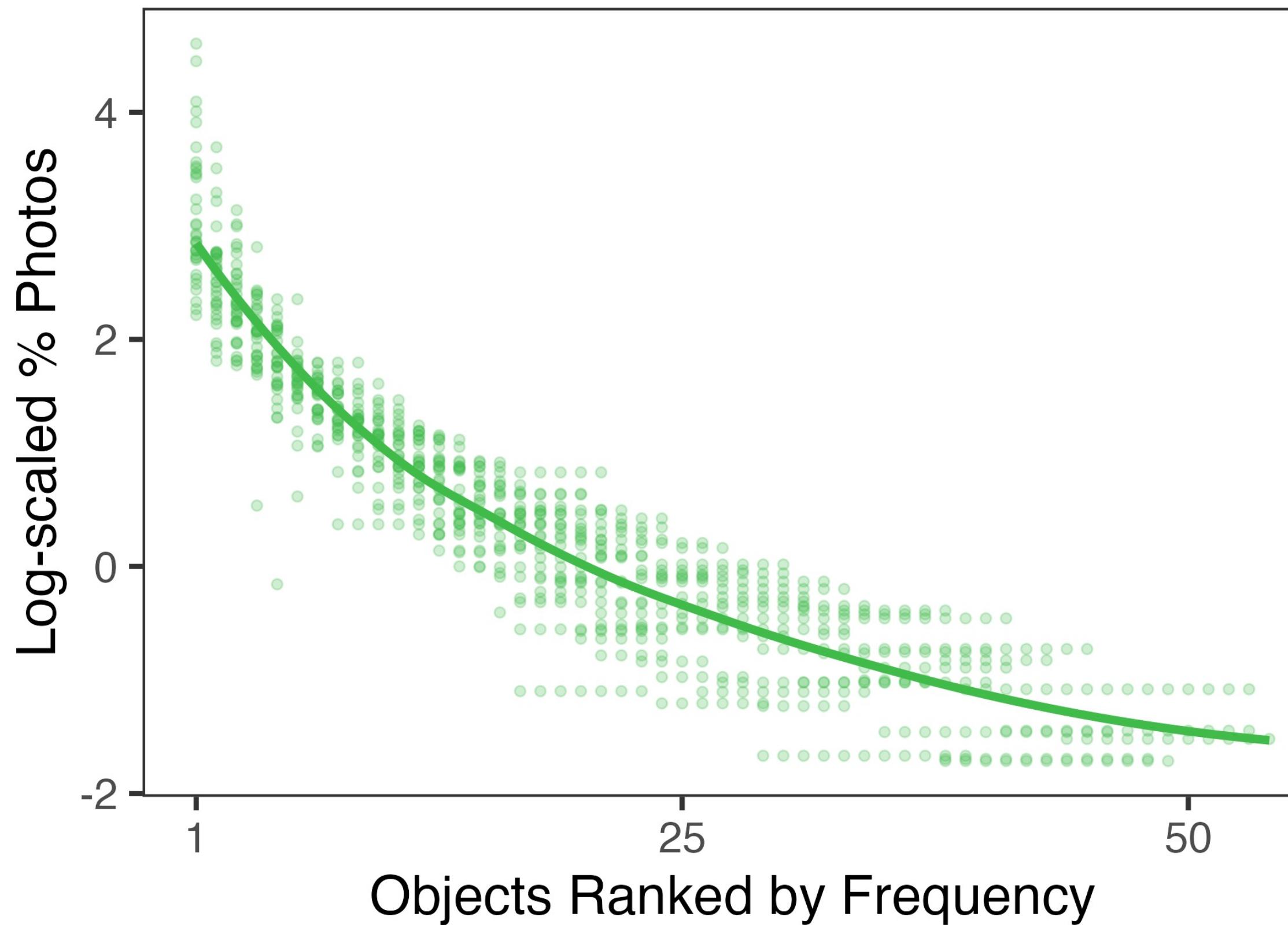
## RESULTS: object handling increases with age



# RESULTS: right-skewed distribution of common object types



**R E S U L T S :** right-skewed distribution of common **object types**

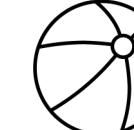


**Q2: How does object handling relate to word learning in Tseltal?**

# CHECKLIST METHOD

VEHICLES ANIMALS TOYS

xanich	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
xawin	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>xaw</i>	
xpokok	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
xulem	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
xux	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>xux</i>	
abion/avion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
aktobus/autobus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
bisikleta/bicicleta	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
bocho	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
karo/carro	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>karo</i>	
koral te'	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
moto	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
kanika/canica	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>kanica</i>	
lapis/lapiz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
libro	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
munyeka/muñeca	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>muñeca</i>	
pelota	<input type="checkbox"/>	<input checked="" type="checkbox"/> <i>Pelota</i>	
ton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



N: 84 children

Age range: 9–23 months ( $M = 16$ )

250 total words

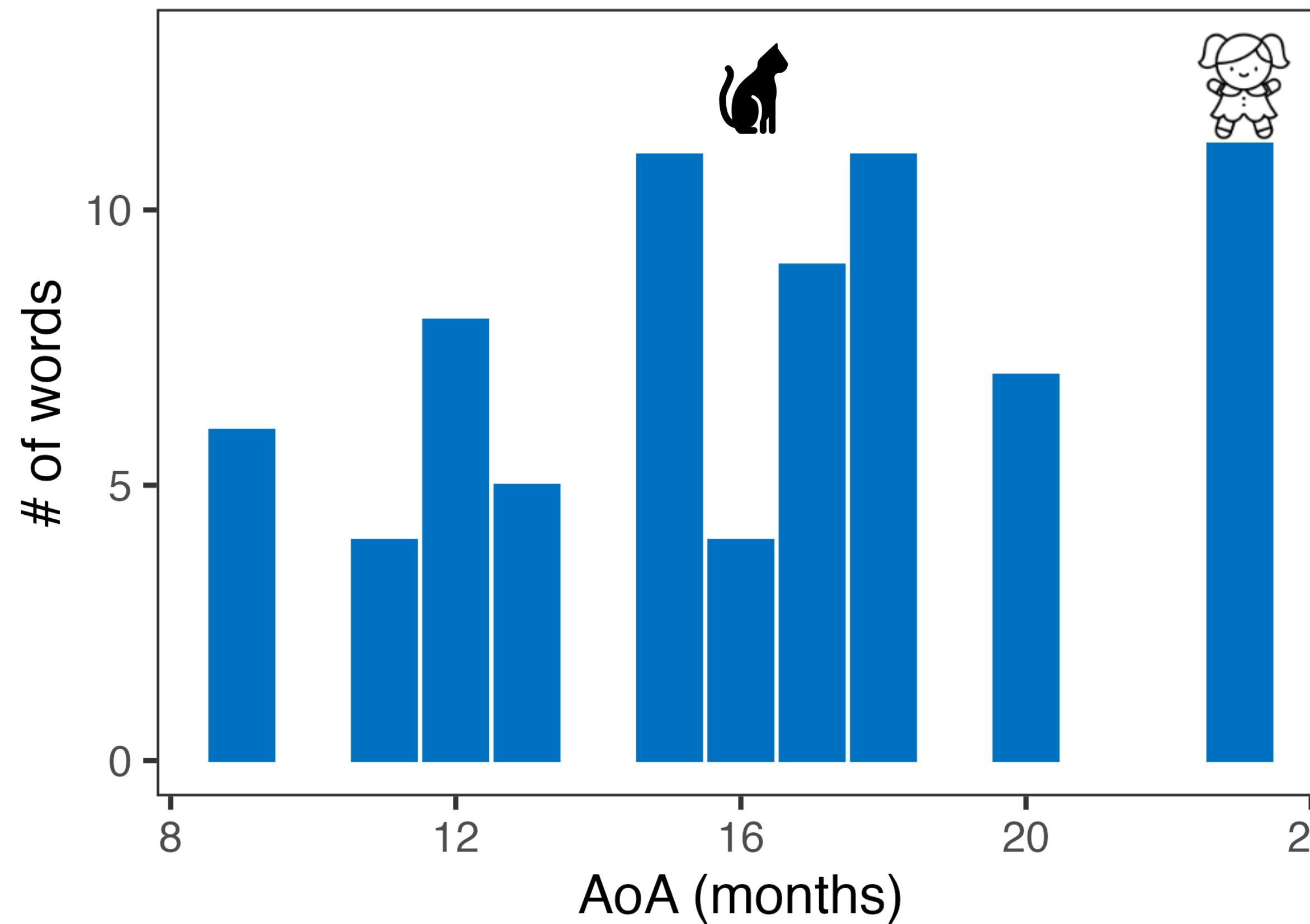
78 object/animal nouns included in the present analyses

Checklist developers:

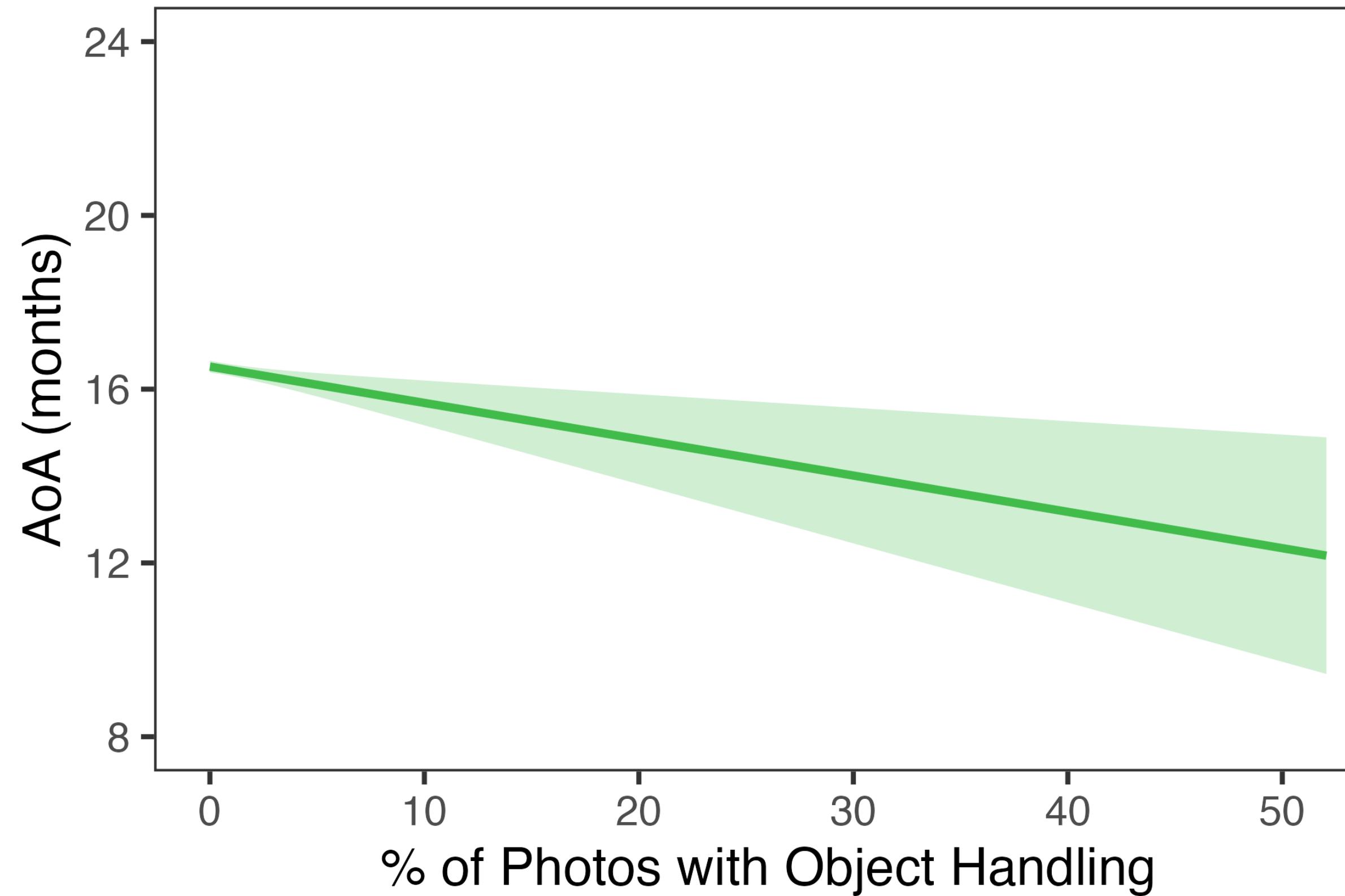
Marisa Casillas, Humbertina Gómez Pérez, Penny Brown



# CHECKLIST METHOD: Calculating AoA

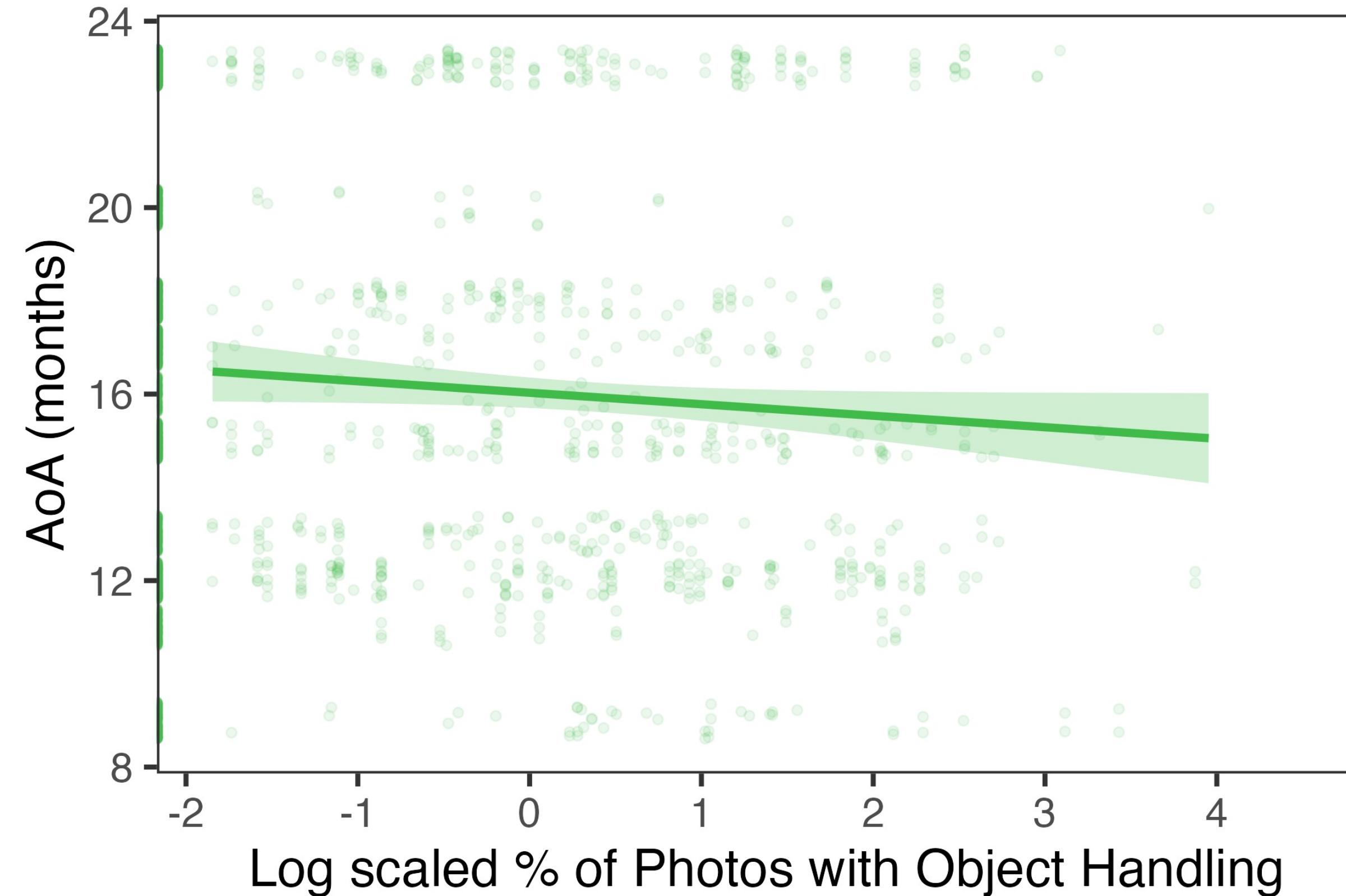


## RESULTS: object handling predicts earlier AoA



`glmer(aoa ~ prop_handling + (1|child))`

## RESULTS: object handling predicts earlier AoA



# SUMMARY

## OBJECT HANDLING

1/3 of waking time

Increases with age

Nearly 1/2 after 1;0

## SUMMARY

### OBJECT HANDLING

1/3 of waking time

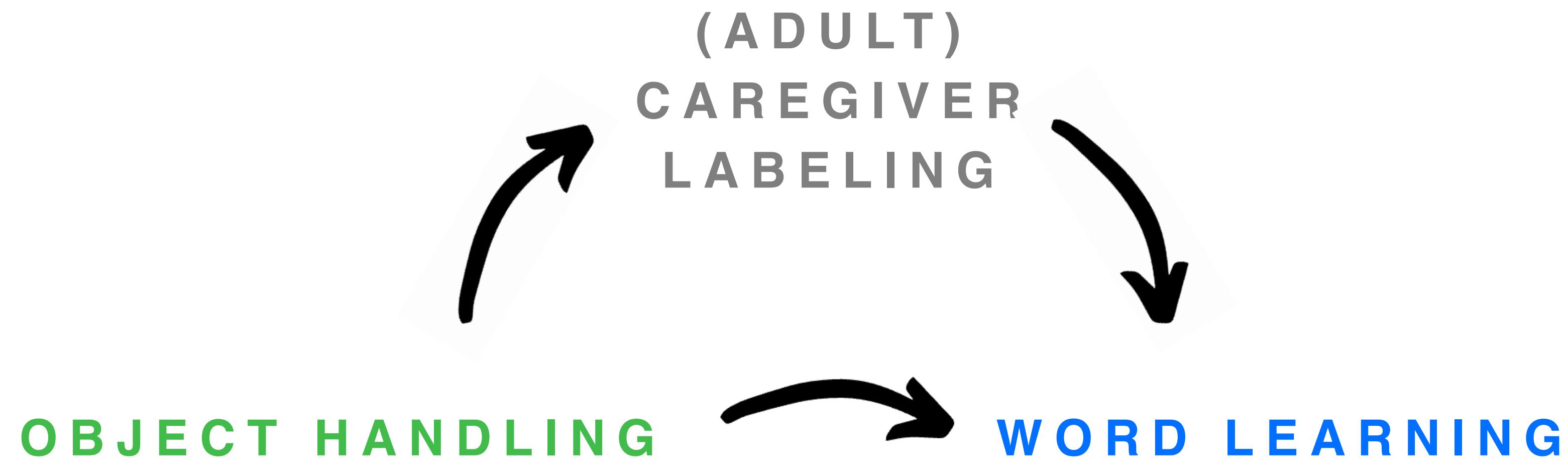
Increases with age

Nearly 1/2 after 1;0



### WORD LEARNING

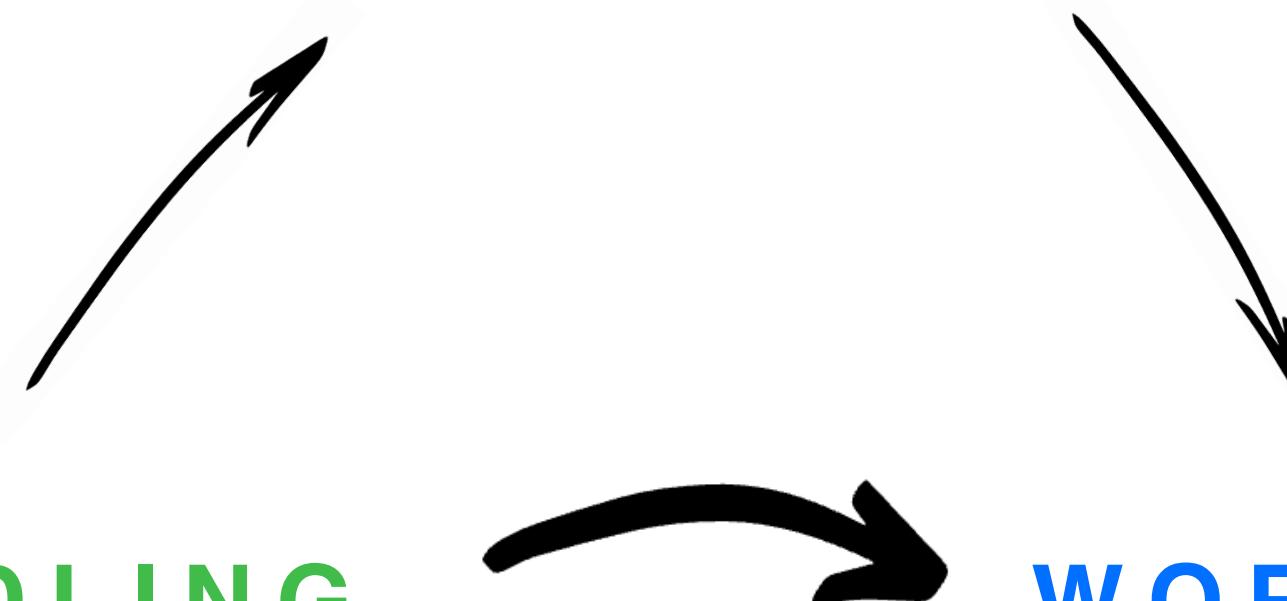
Earlier AoA (production)



**OBJECT HANDLING**

**INFREQUENT  
LABELING**

*Brown, 2011; Brown & Casillas, 2021;  
Casillas et al., 2020; de León, IASCL 2024*



**WORD LEARNING**

## OBJECT HANDLING



salience?

word frequency?

interest?

## WORD LEARNING



cultural relevance?

activity contexts?

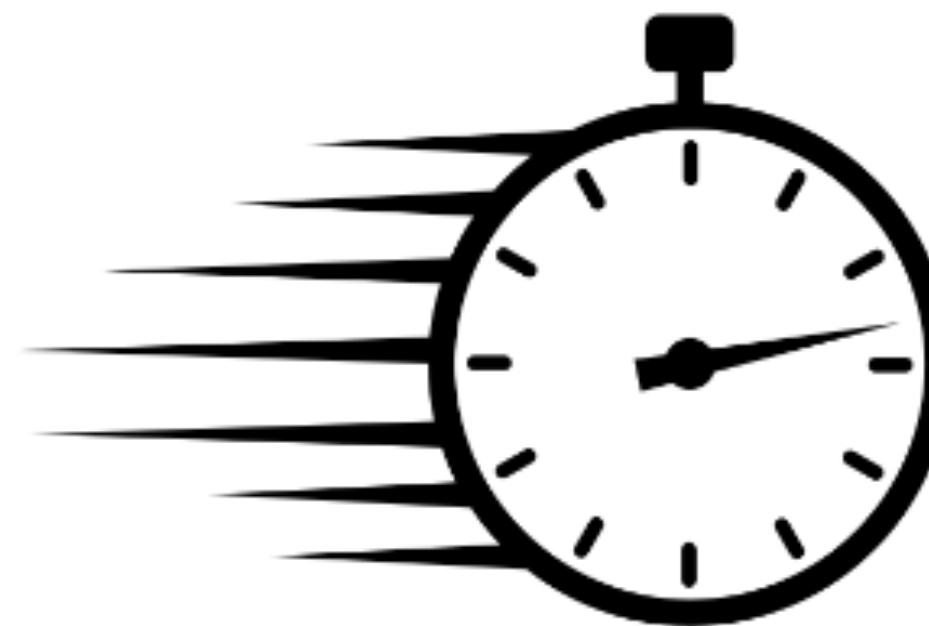
animacy?

# SAMPLING STRATEGIES MATTER

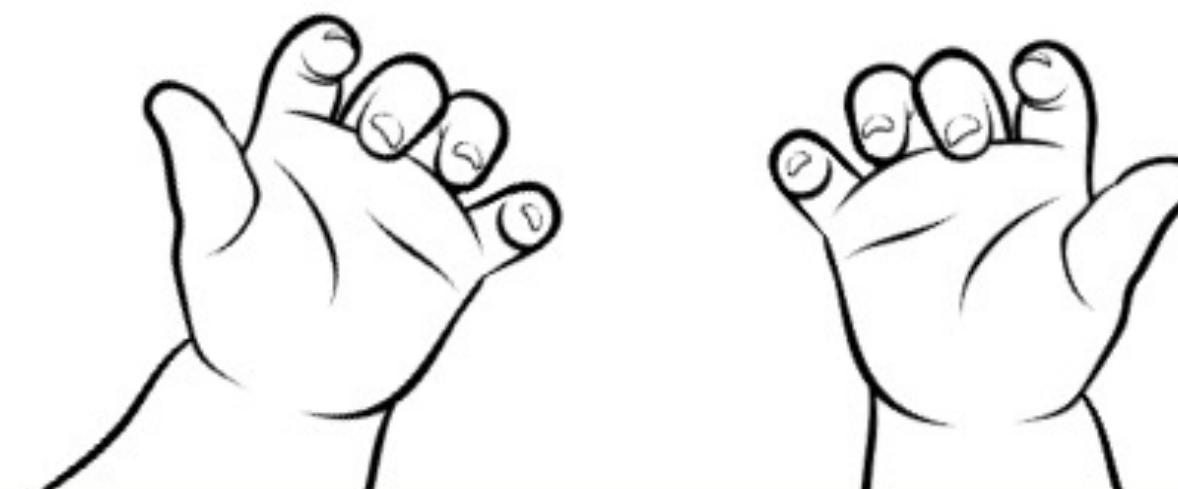
Cultural and linguistic variation



Recording length and context



Egocentric/child-perspective



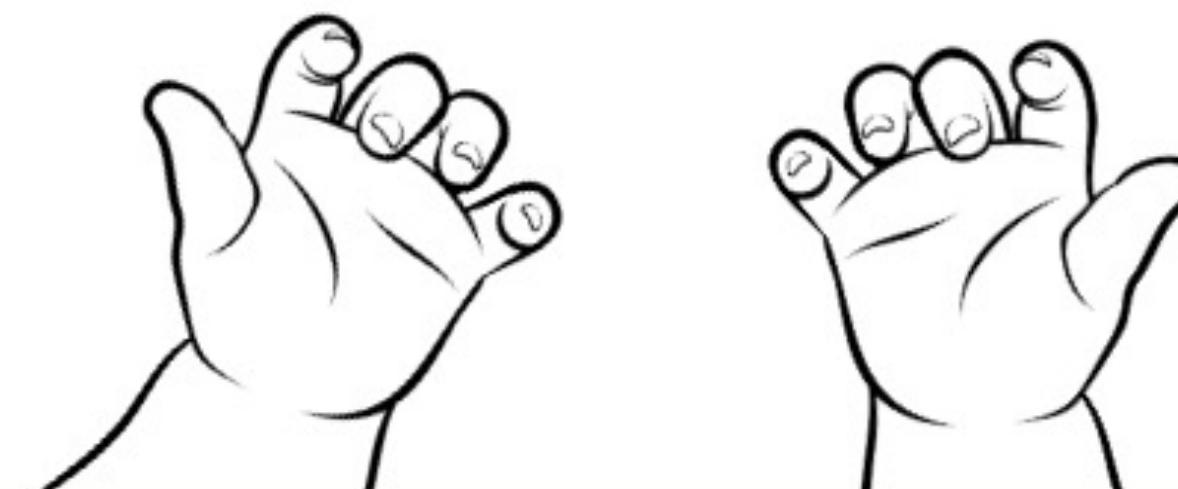
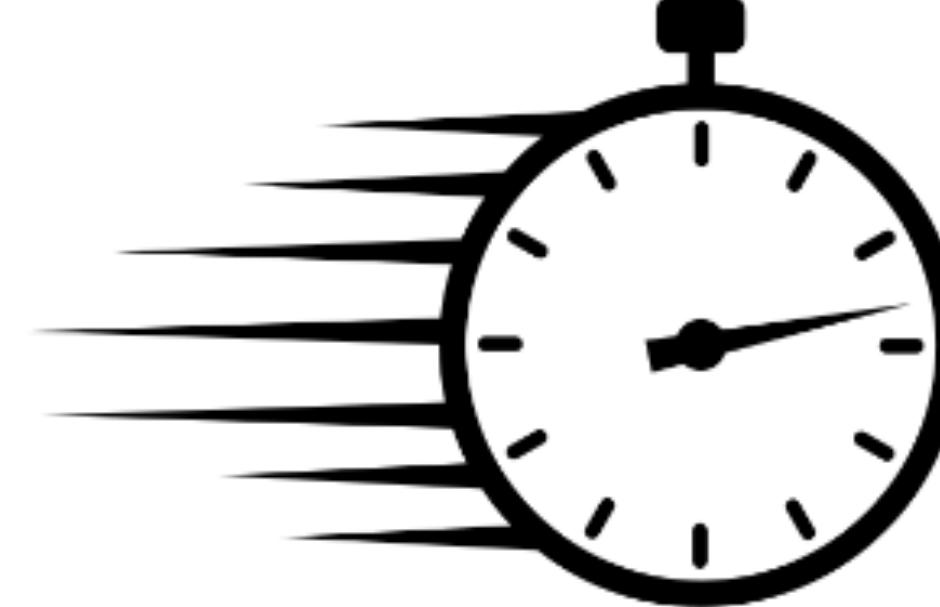
# SAMPLING STRATEGIES MATTER

Cultural and linguistic variation



33% vs. 65+

Egocentric/child-perspective

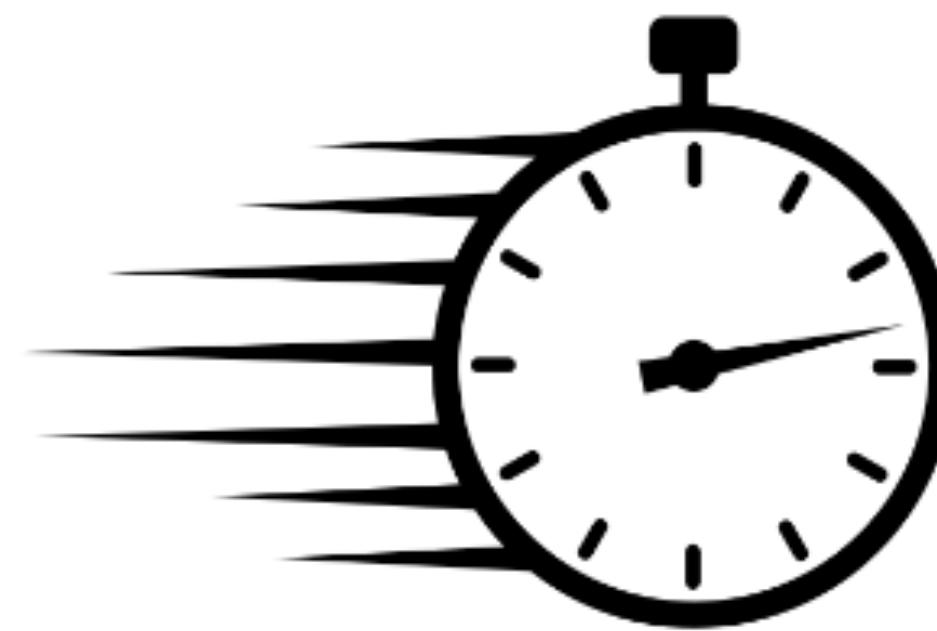


# SAMPLING STRATEGIES MATTER

Cultural and linguistic variation

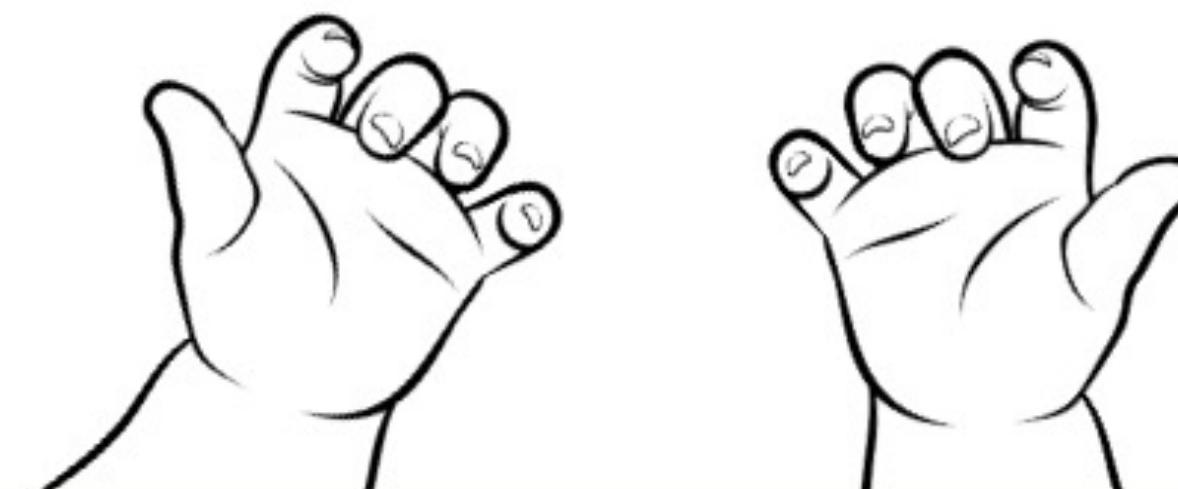


Recording length and context



0-75% ( $M = 23\%$ )

Egocentric/child-perspective

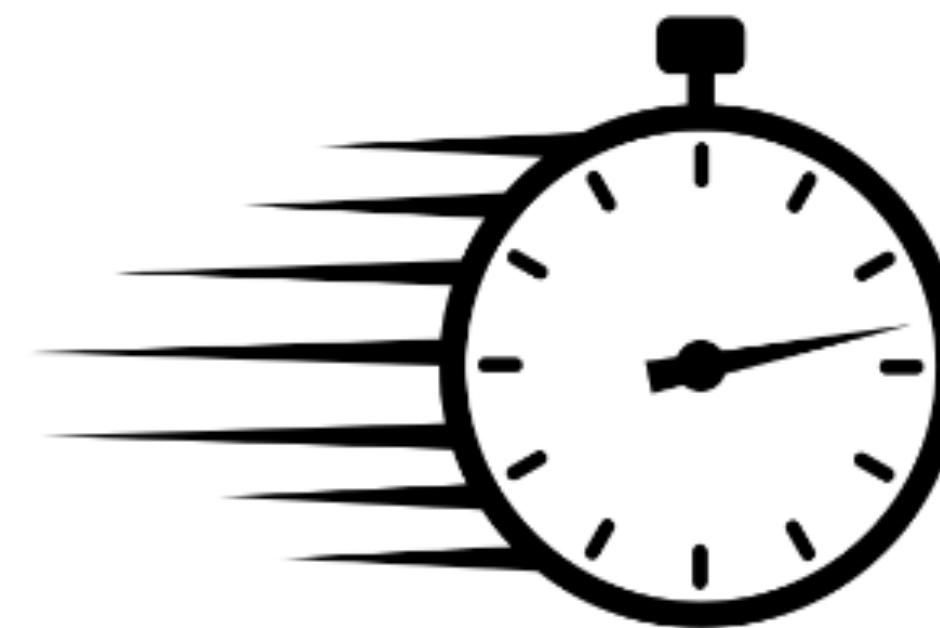


# SAMPLING STRATEGIES MATTER

Cultural and linguistic variation

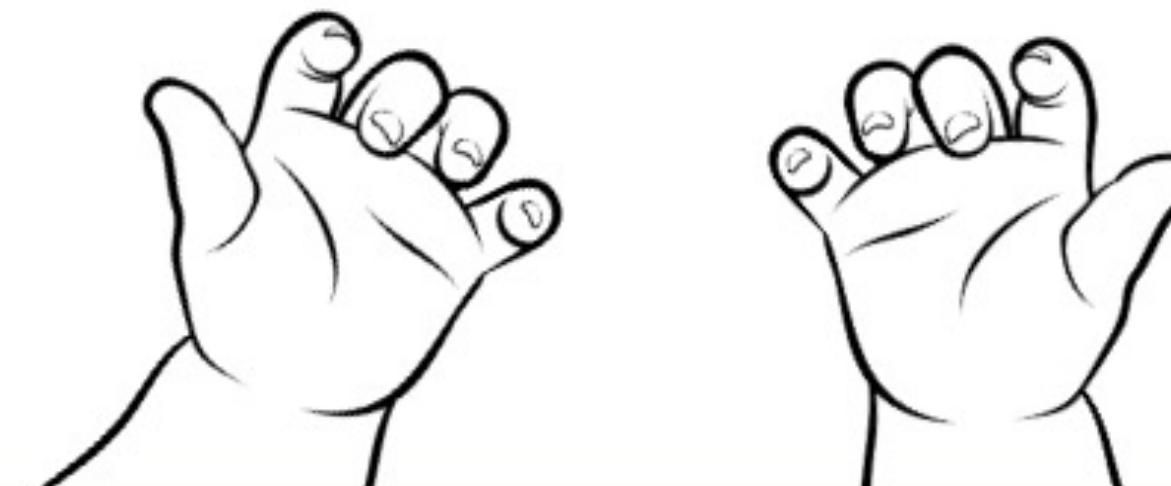


Recording length and context



Egocentric/child-perspective

Child: 33%  
vs.  
Interactant: 1%

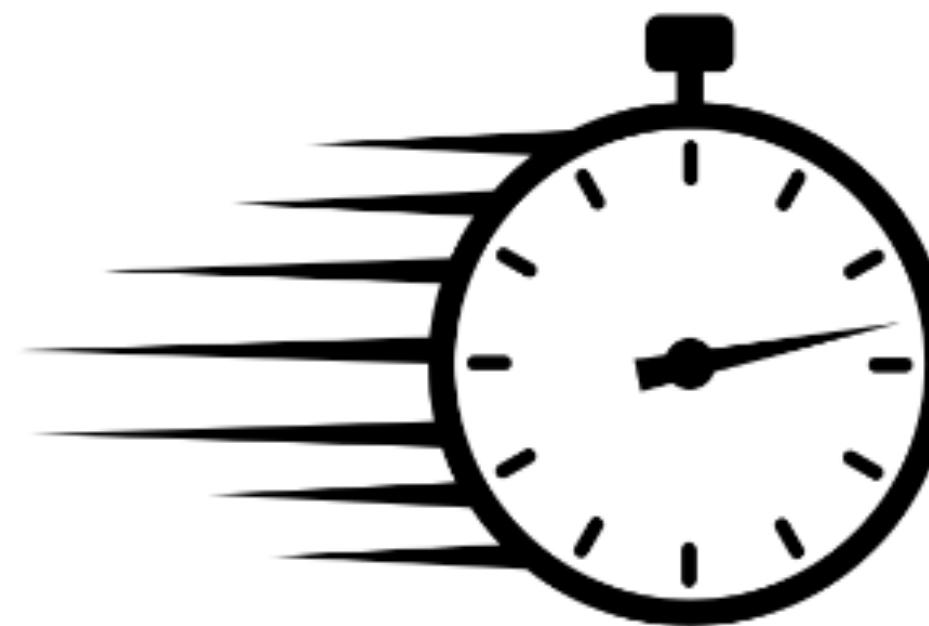


# SAMPLING STRATEGIES MATTER

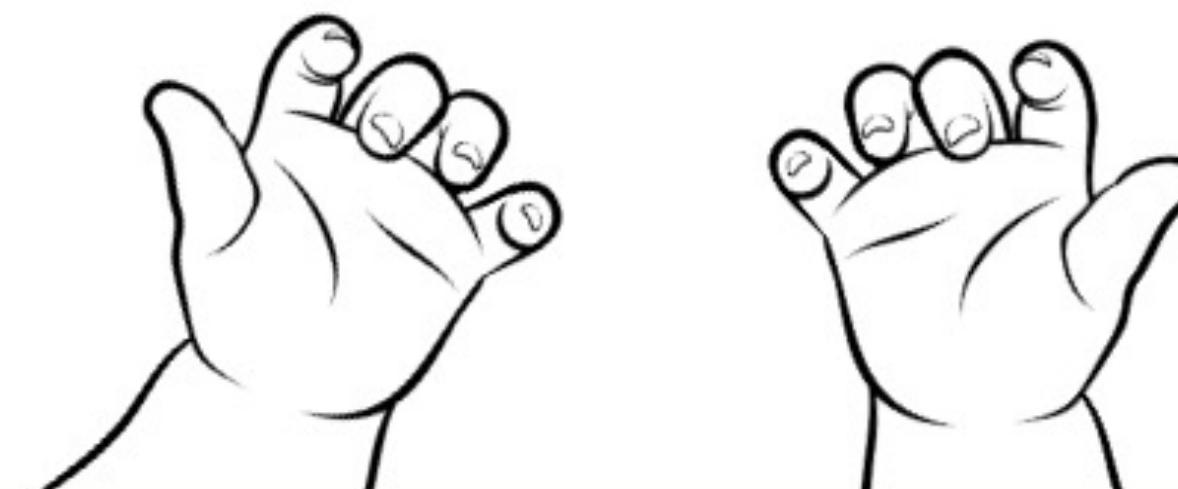
Cultural and linguistic variation



Recording length and context



Egocentric/child-perspective



# ACKNOWLEDGMENTS



Checklist team



Object annotation team



Participating Tseltal families  
and community members

