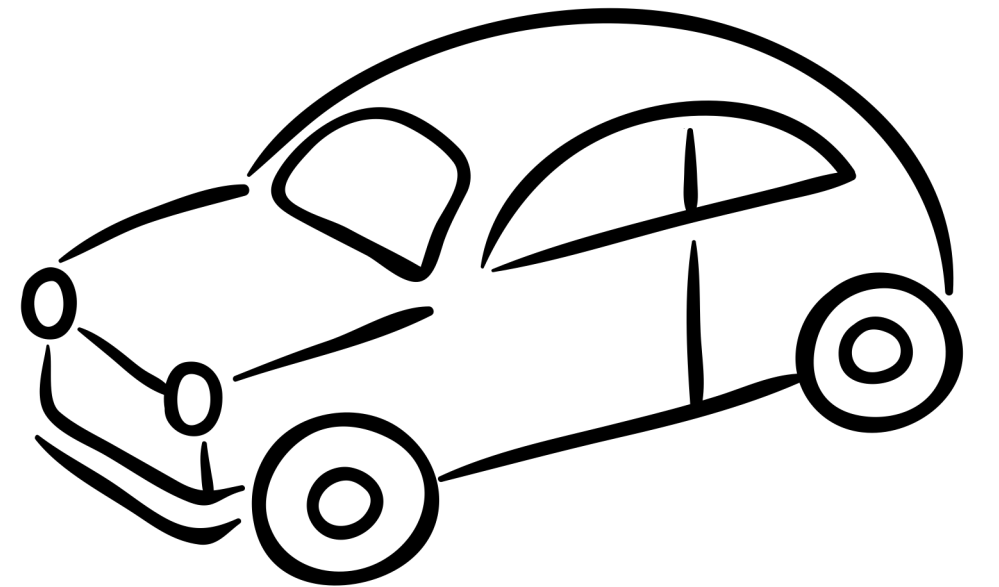
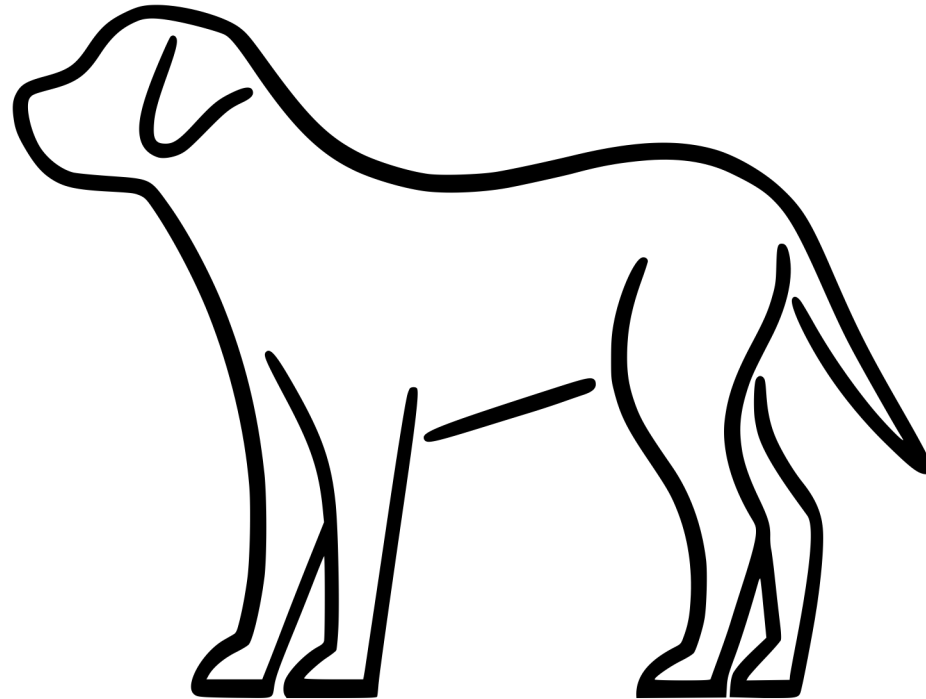
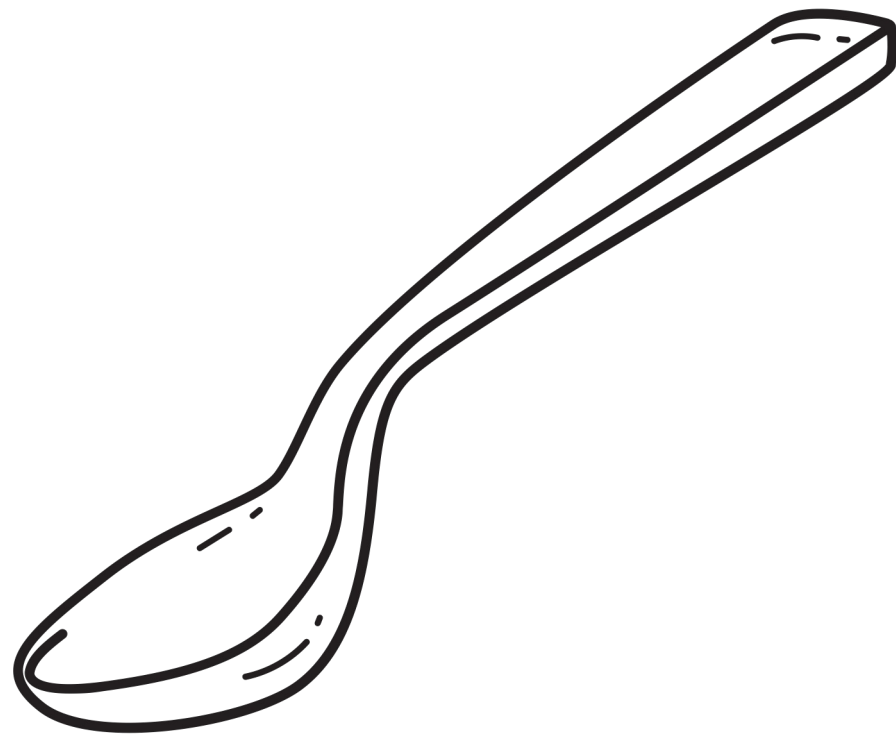
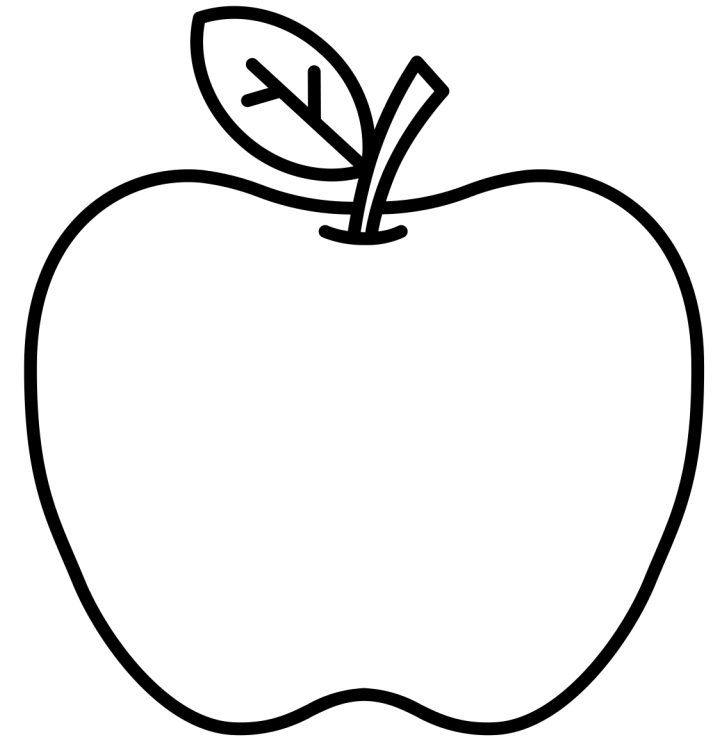
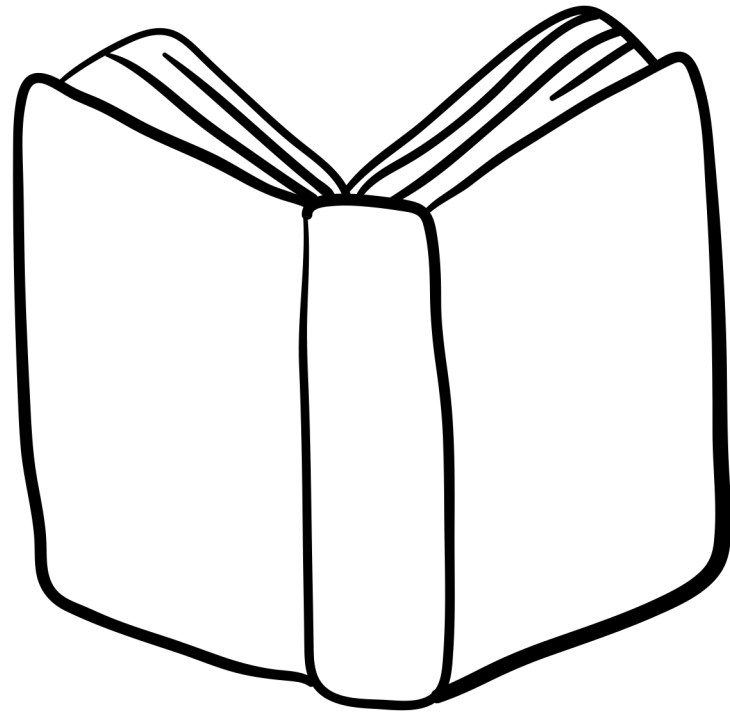
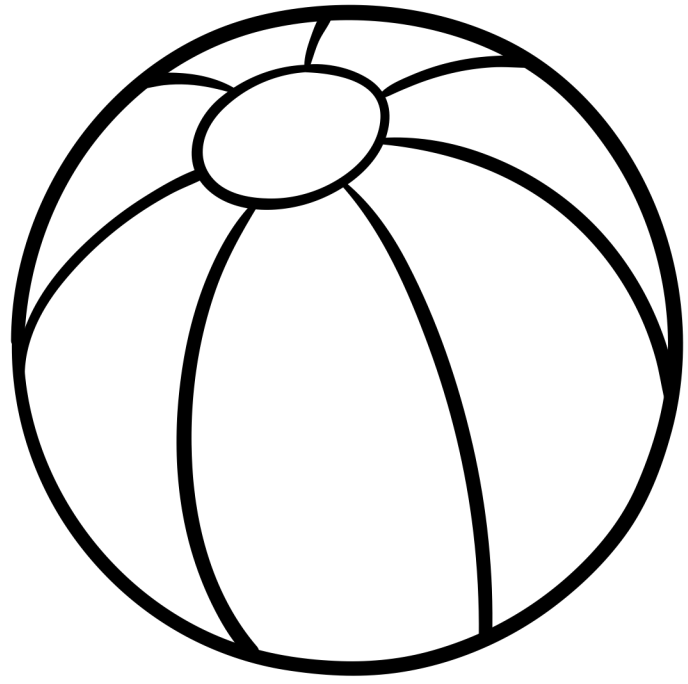


# OBJECT HANDLING PREDICTS AGE OF NOUN ACQUISITION IN A TSELTAL MAYAN COMMUNITY

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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**



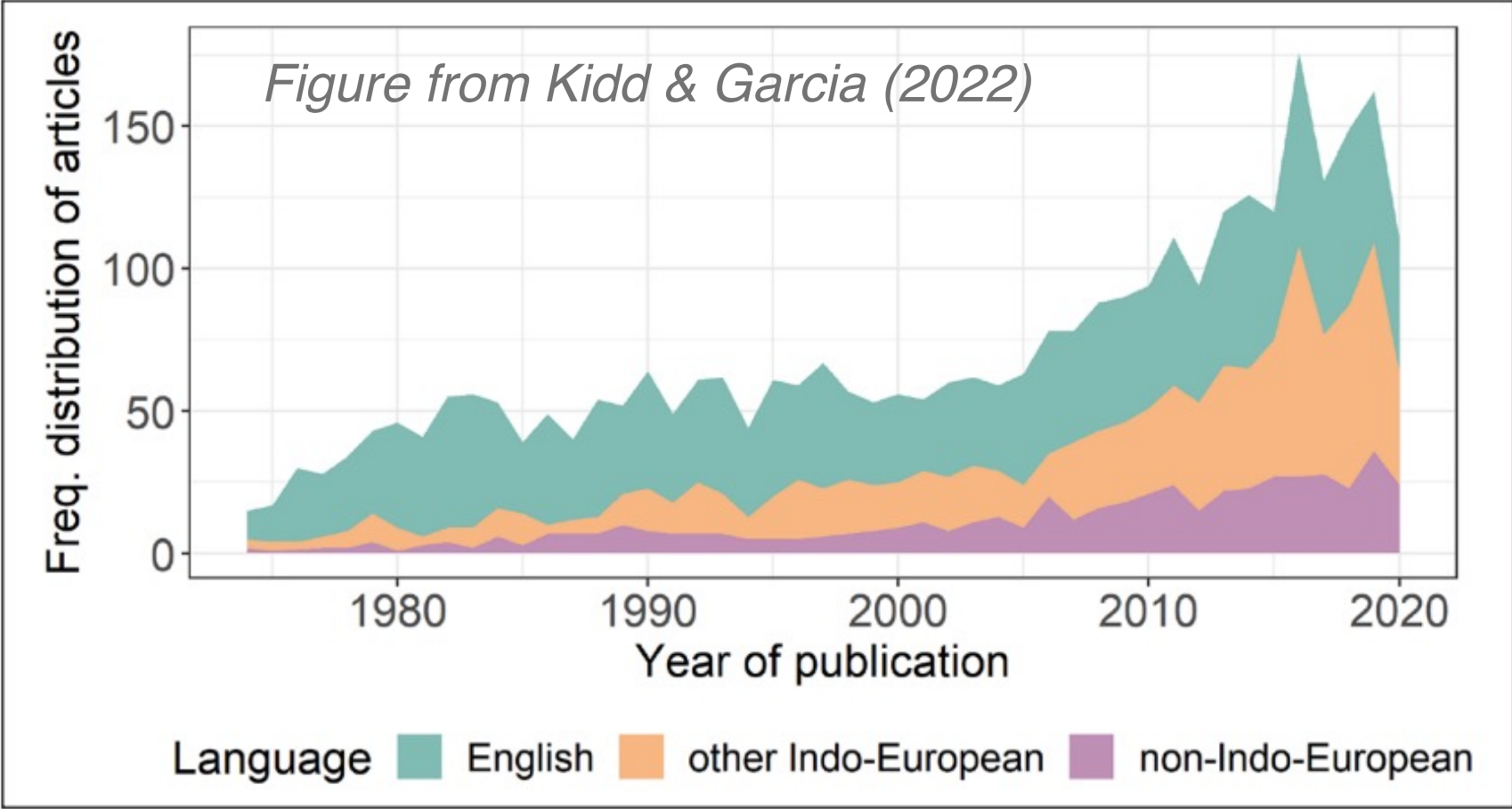
**WORD LEARNING**



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

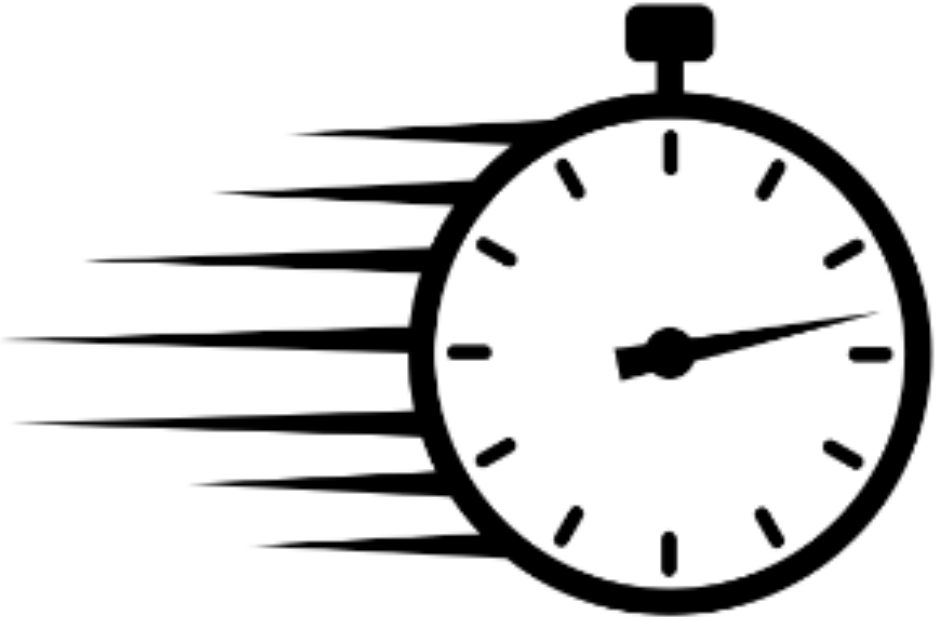
# NEED FOR REPRESENTATIVE SAMPLES AND TIMESCALES

## 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 TSELTAI (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 Tselal children's **object handling**?

# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1 camera



Photojojo "super" fisheye lens (180° view)



*Image from Casillas & Casey (2024)*





***photo stream***

~9 recorded hours

2 photos per minute



\*rotated 90° for presentation

**35moF**

*Casillas HomeBank Corpus (2017)*



# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1 camera



Photojojo "super" fisheye lens (180° view)



35mm F

# RECORDING METHOD: CHEST-WORN CAMERAS



Narrative Clip 1  
camera



Photojojo "super"  
fisheye lens  
(180° view)

**N:** 38 children

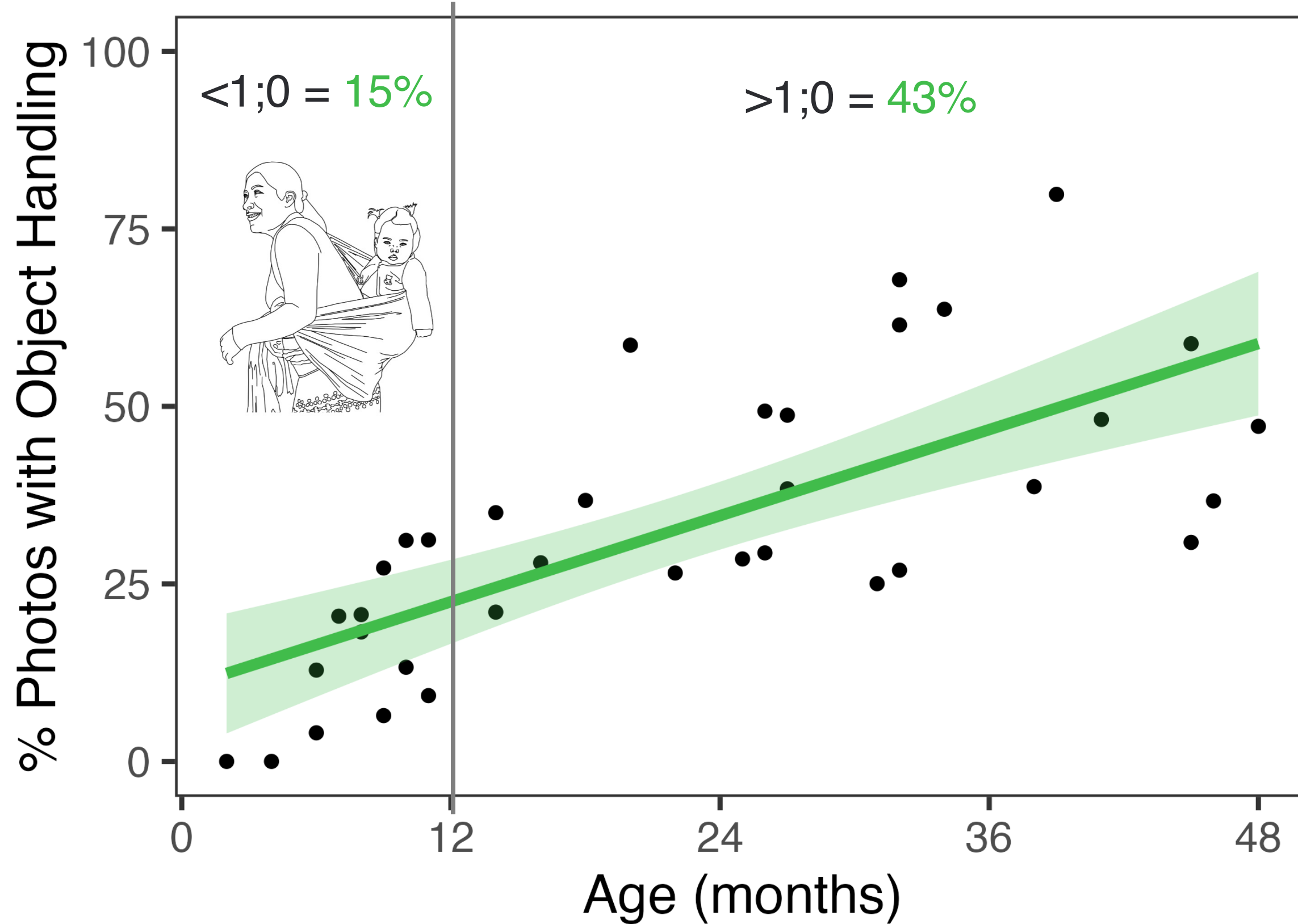
**Age range:** 2–48 months ( $M = 21$ )

2 photos per minute

~9 recorded hours per child

>40k total photos

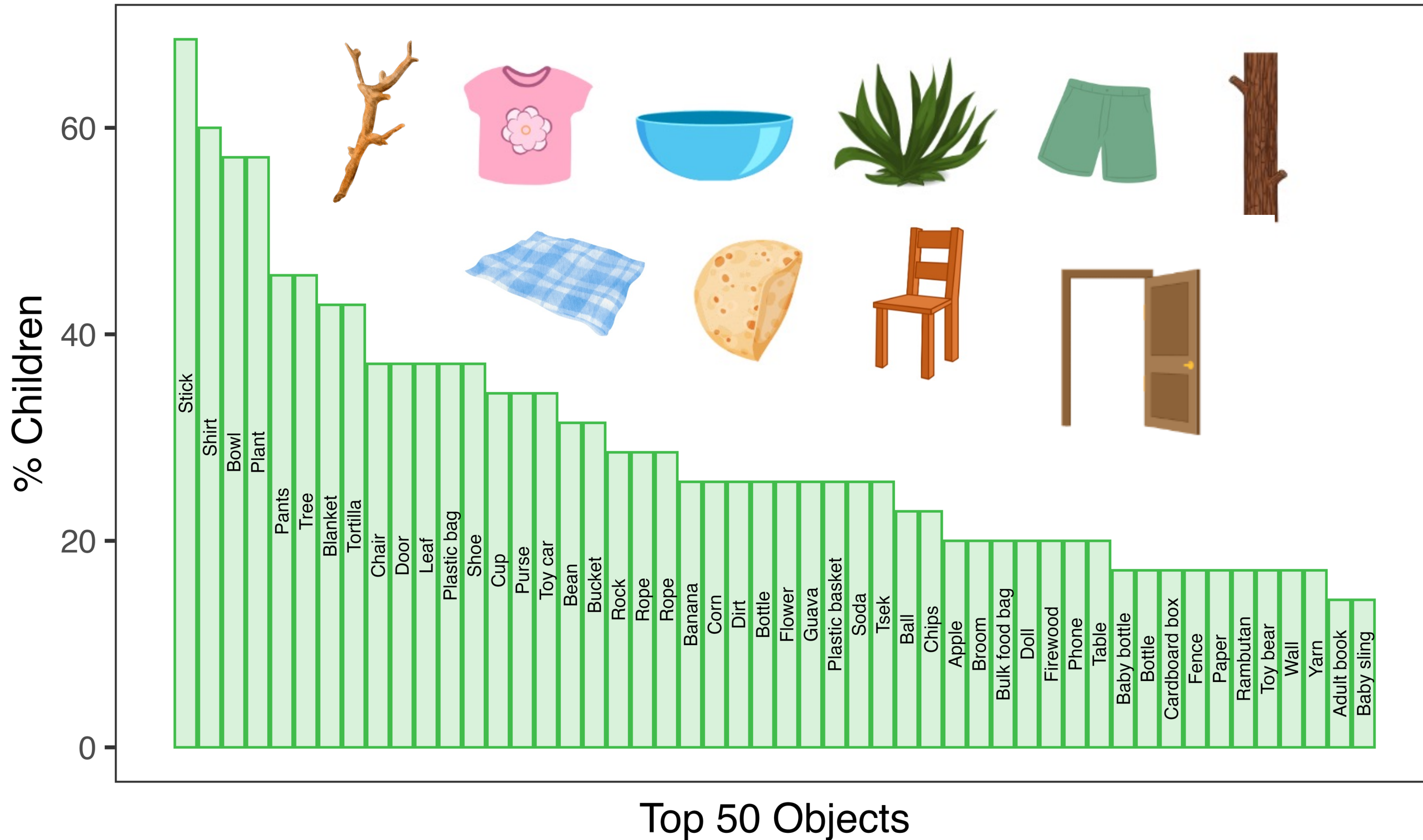
**RESULTS:** **object handling** increases with age



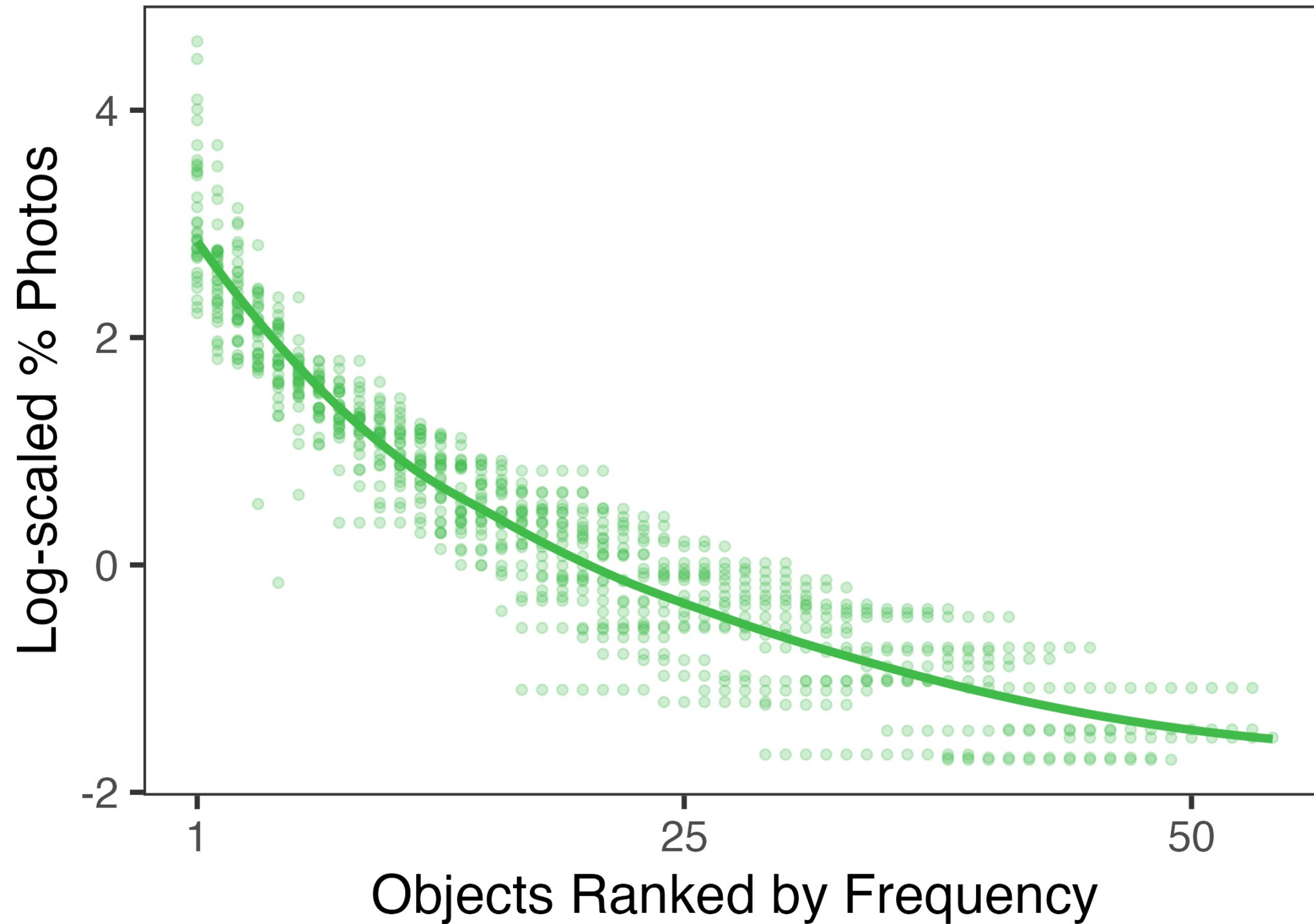
*M* = 33% of waking day



# RESULTS: right-skewed distribution of common **object types**



**RESULTS:** right-skewed distribution of common **object types**



**Q2:** How does **object handling** relate to **word learning** in Tsel'tal?

# CHECKLIST METHOD

ANIMALS



xanich  
xawin  
xpokok  
xulem  
xux

*xaw*  
  
  
 *xux*



VEHICLES

abion/avion  
aktobus/autobus  
bisikleta/bicicleta  
bocho  
karo/carro  
koral te'  
moto

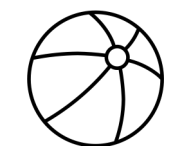
*karo*



TOYS

kanika/canica  
lapis/lapiz  
libro  
munyeka/muñeca  
pelota  
ton

*kanica*  
  
  
 *muñeca*  
 *pelota*



**N:** 84 children

**Age range:** 9–23 months ( $M = 16$ )

250 total words

78 object/animal nouns included in the present analyses

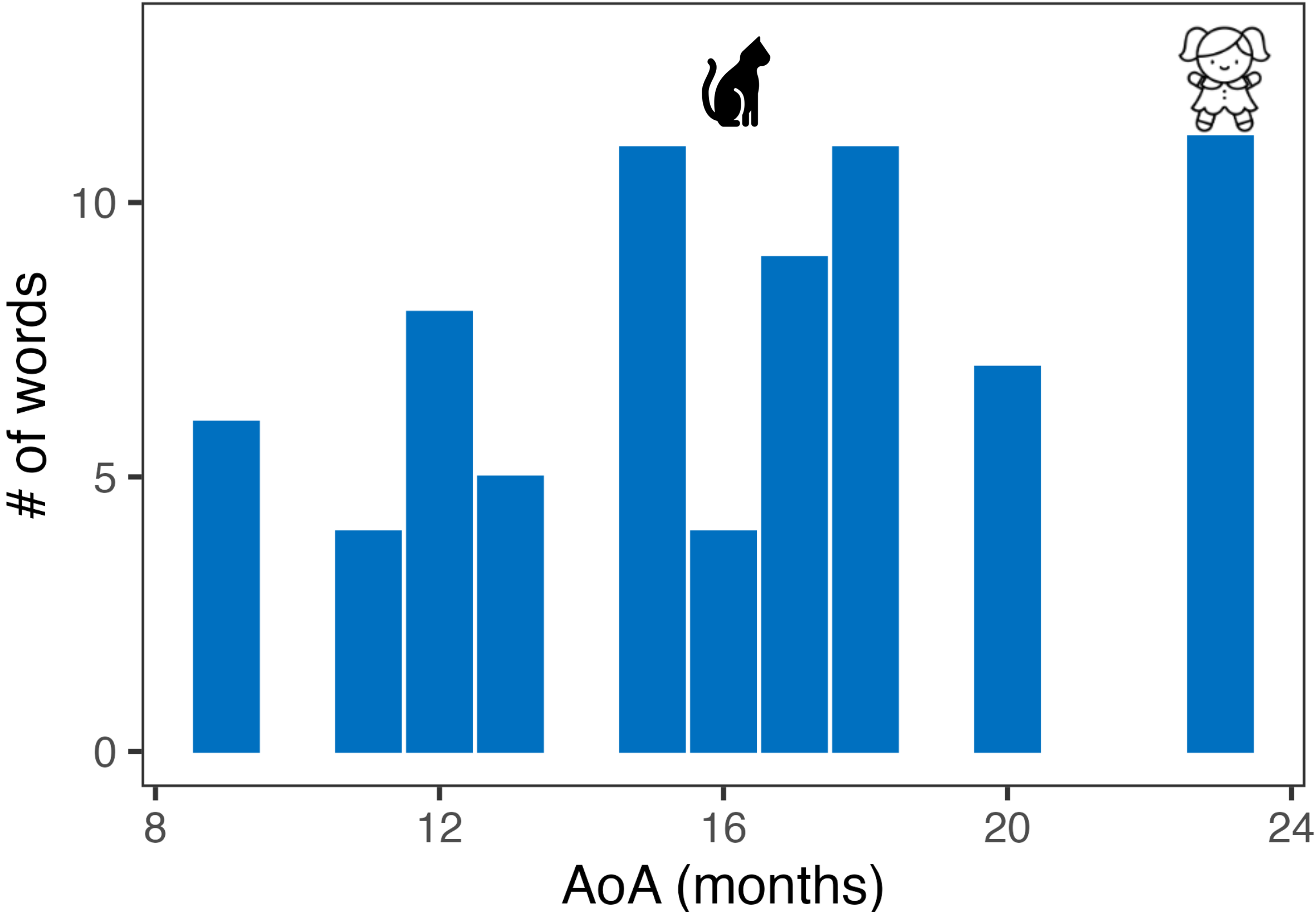
*Checklist developers:*

*Marisa Casillas, Humbertina Gómez Pérez, Penny Brown*

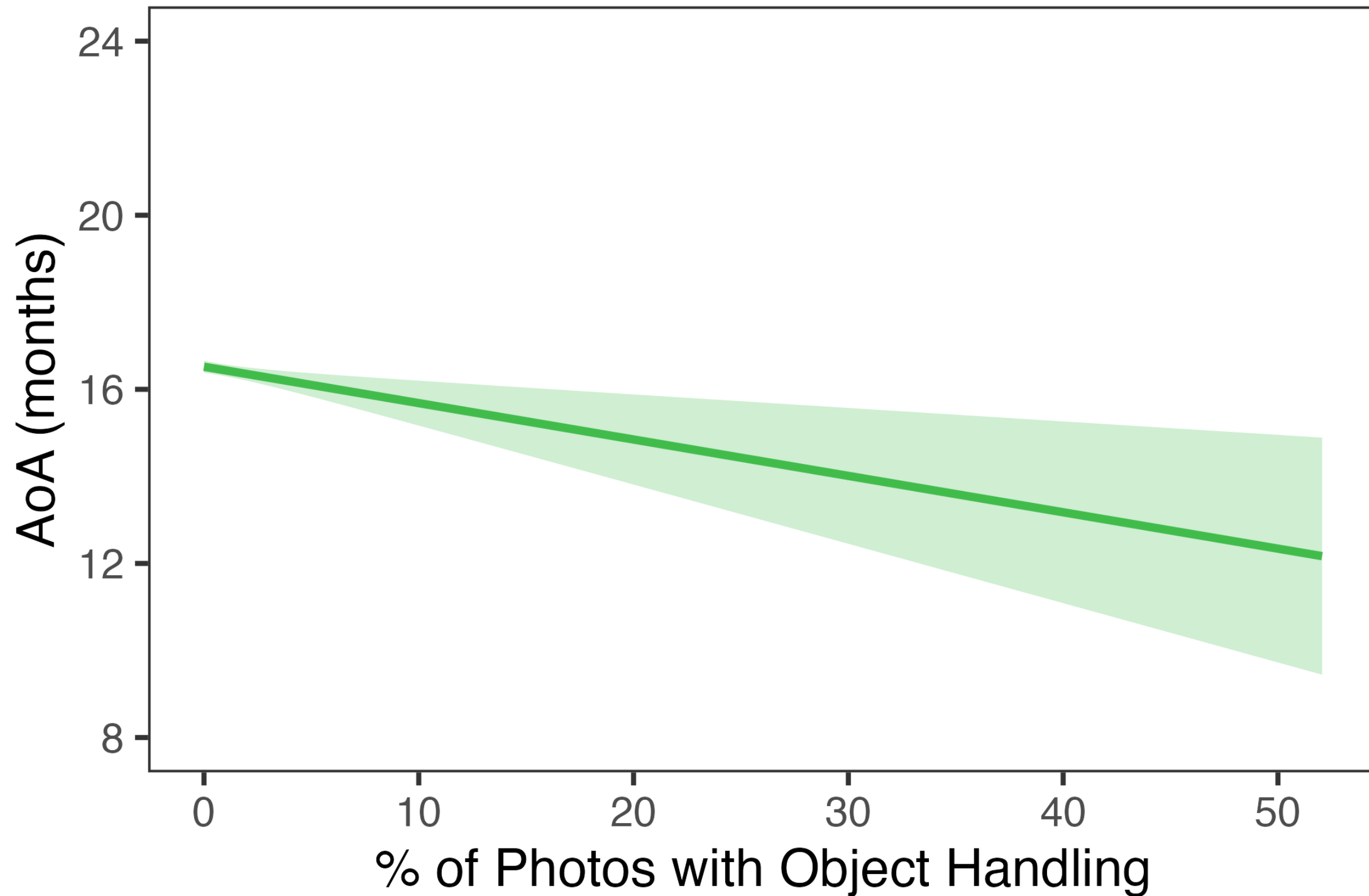




# CHECKLIST METHOD: Calculating AoA

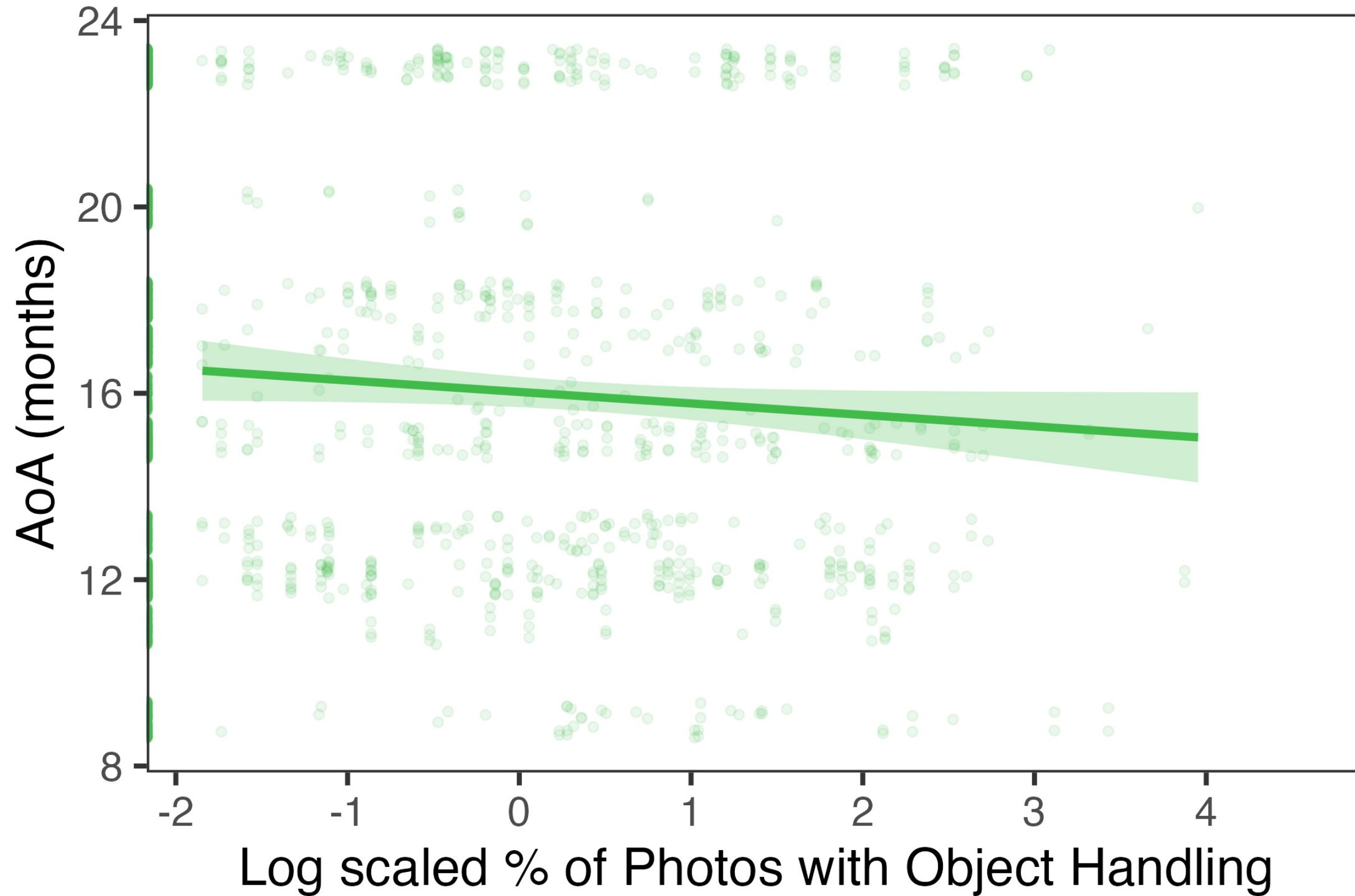


# RESULTS: **object handling** predicts **earlier AoA**



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

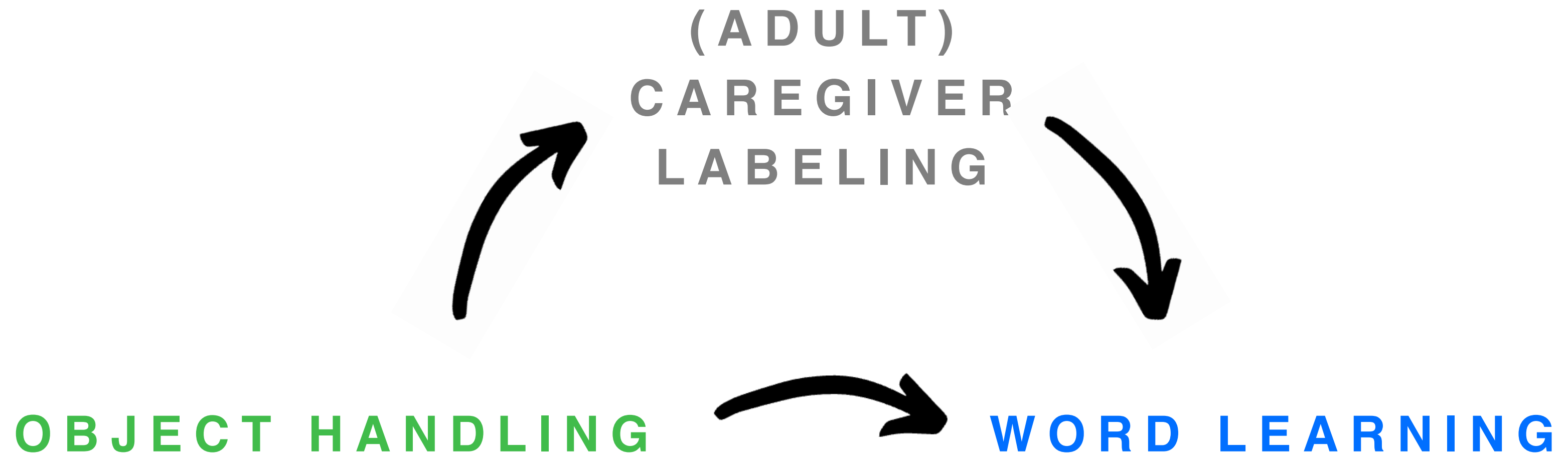
Increases with age

Nearly 1/2 after 1;0



## WORD LEARNING

Earlier AoA (production)

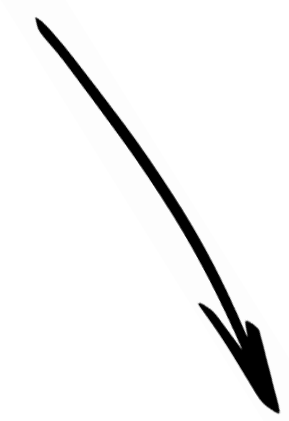
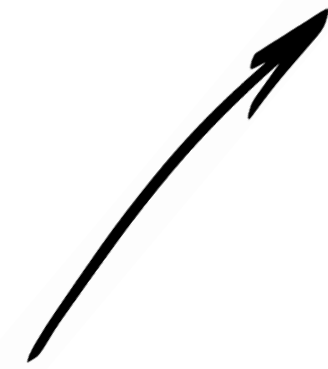


INFREQUENT  
LABELING

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

OBJECT HANDLING

WORD LEARNING



## OBJECT HANDLING



word frequency?

interest?

salience?

## WORD LEARNING



cultural relevance?

activity contexts?

animacy?

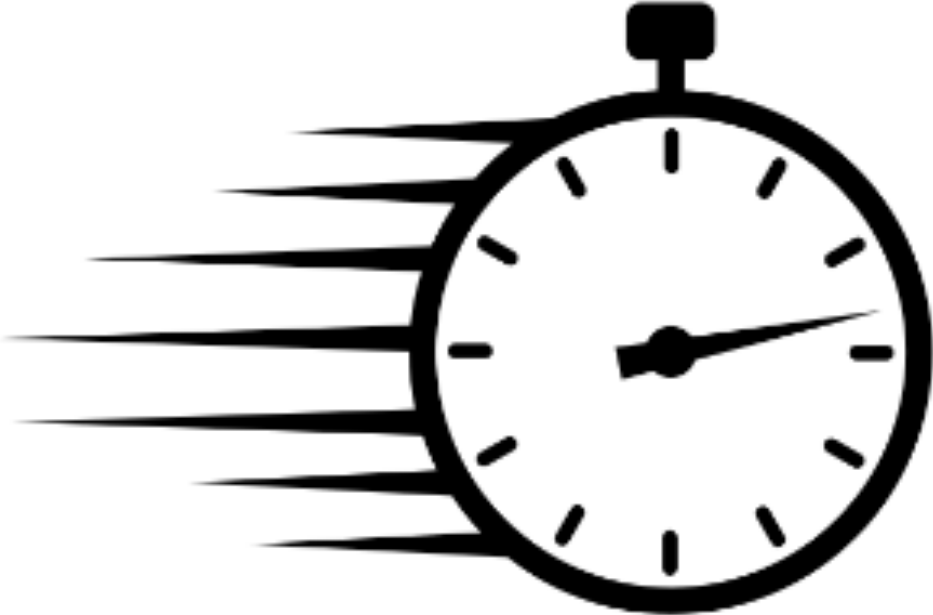


# SAMPLING STRATEGIES MATTTTER

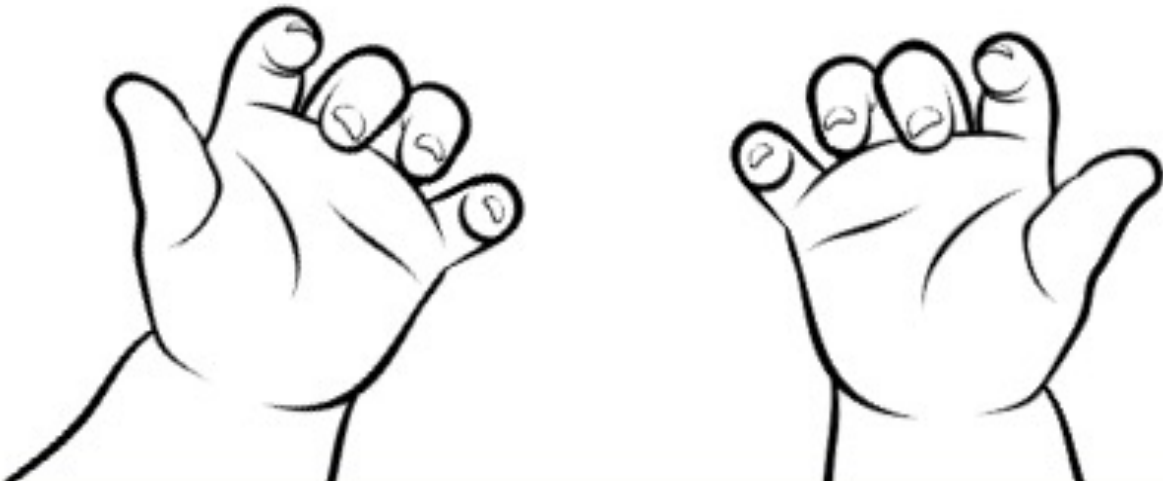
Cultural and linguistic variation



Recording length and context



Egocentric/child-perspective



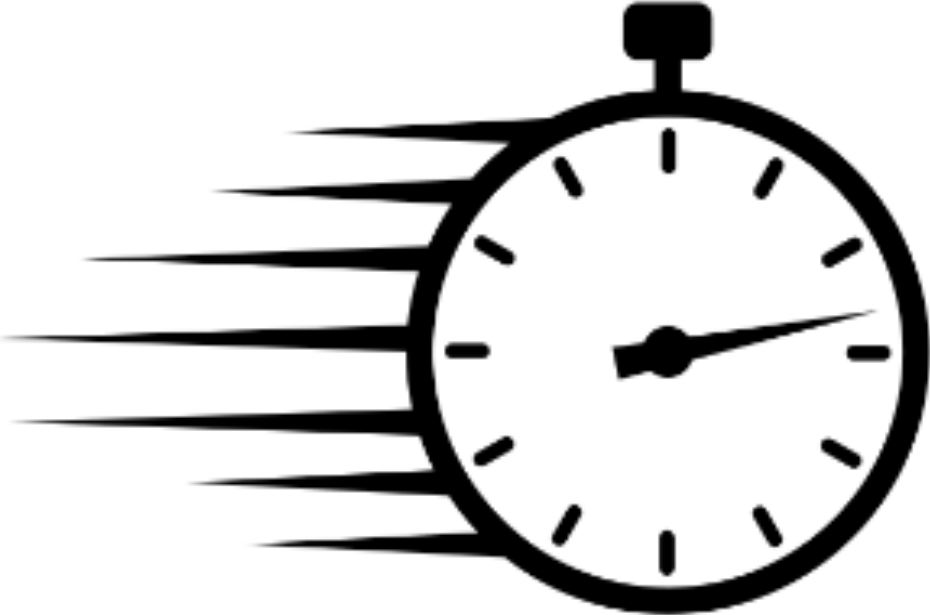
# SAMPLING STRATEGIES MATTTTER

Cultural and linguistic variation

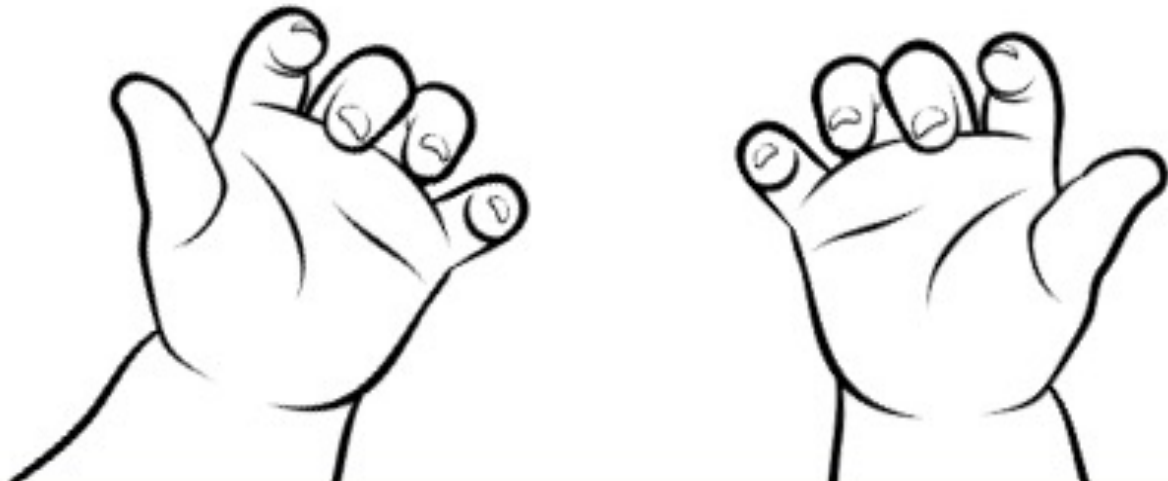


**33%** vs. **65+%**

Recording length and context



Egocentric/child-perspective

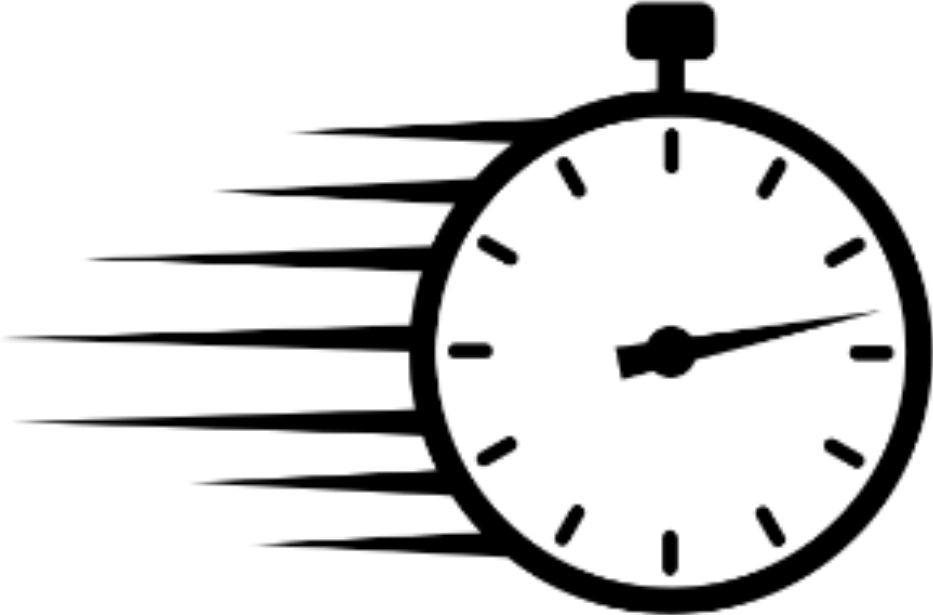


# SAMPLING STRATEGIES MATTTTER

Cultural and linguistic variation

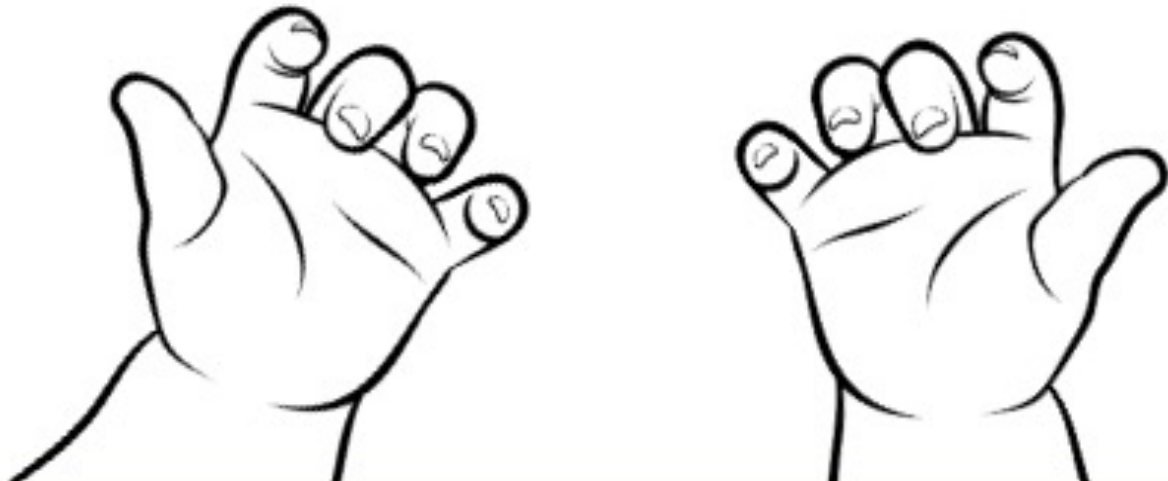


Recording length and context



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

Egocentric/child-perspective

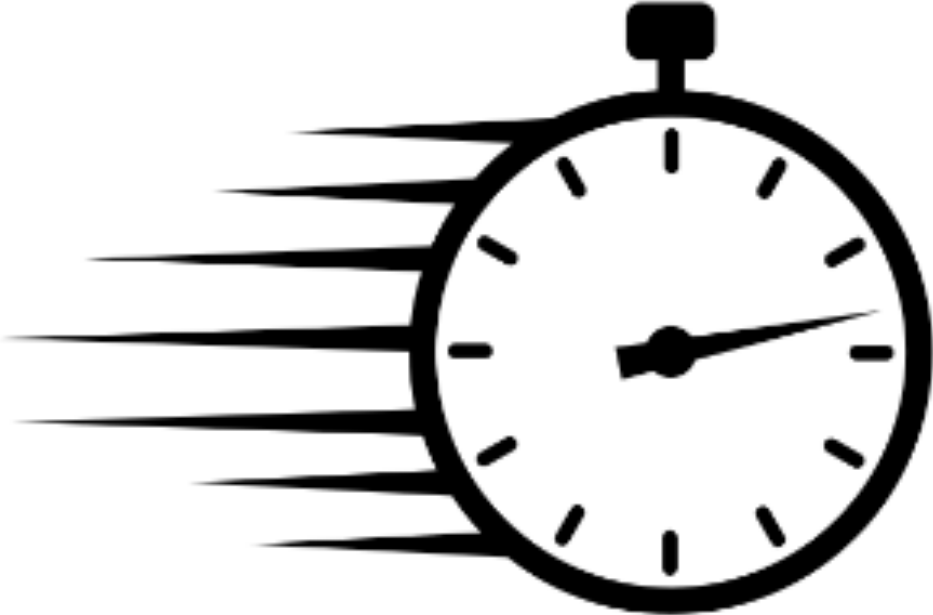


# SAMPLING STRATEGIES MATTTTER

Cultural and linguistic variation



Recording length and context

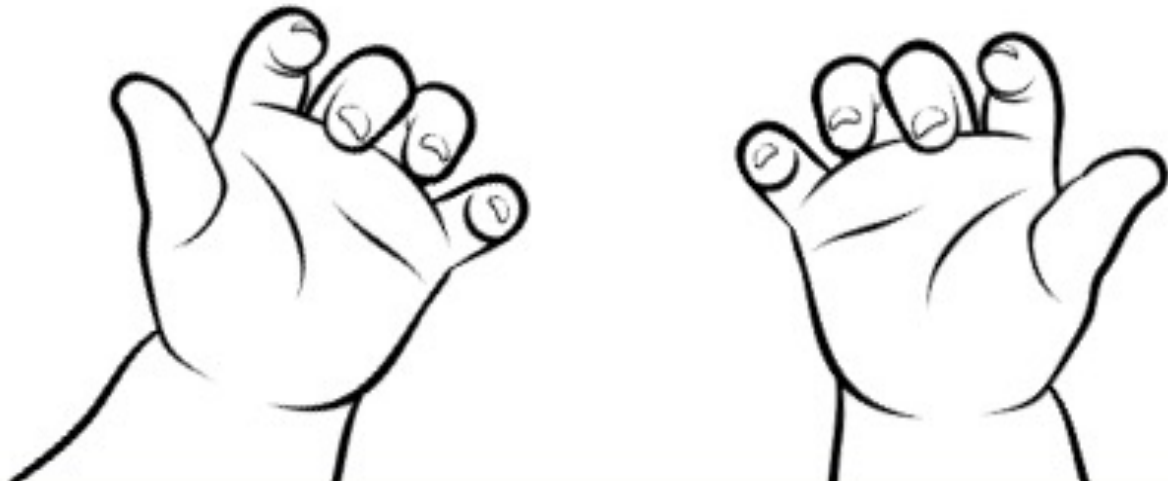


Egocentric/child-perspective

**Child: 33%**

vs.

**Interactant: 1%**



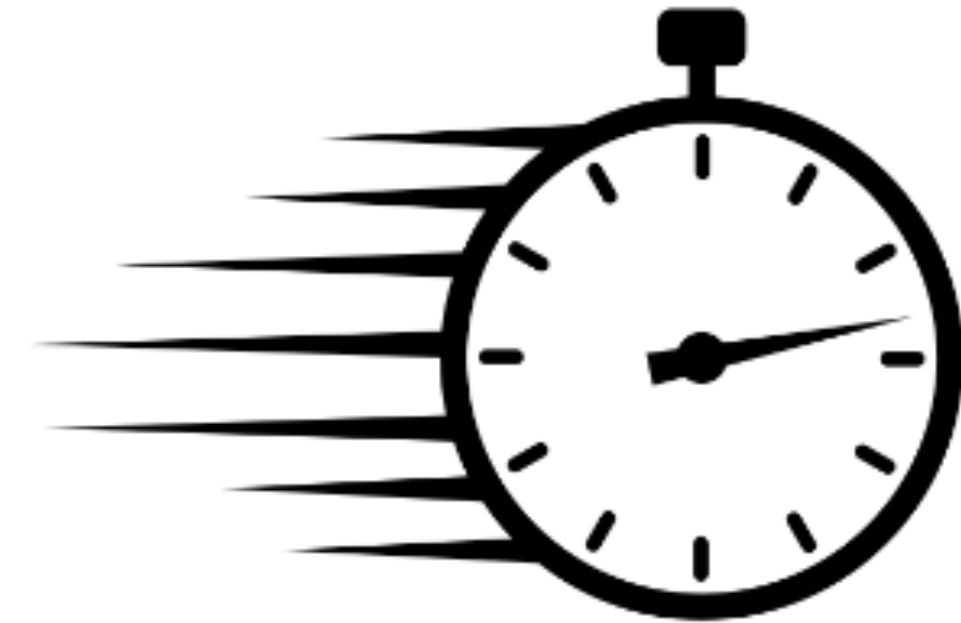


# SAMPLING STRATEGIES MATTTTER

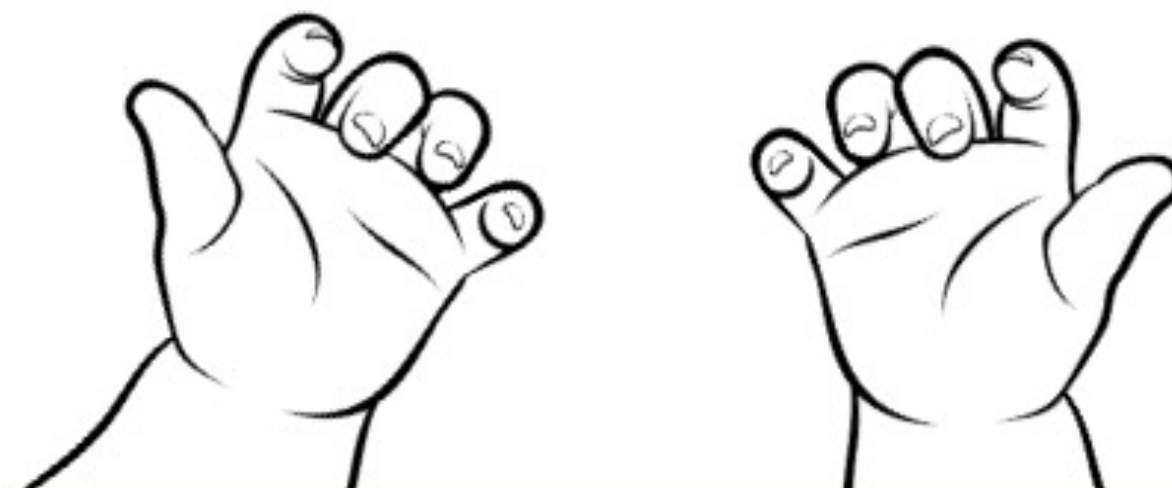
Cultural and linguistic variation



Recording length and context



Egocentric/child-perspective



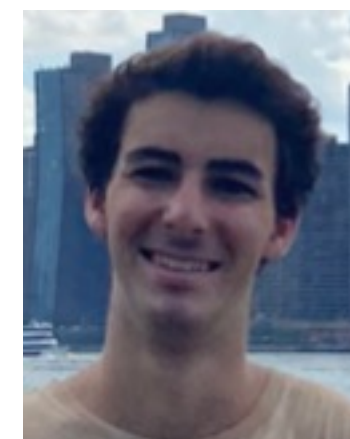
# ACKNOWLEDGMENTS



## Checklist team



## Object annotation team



Participating Tselal families  
and community members

