

# Sticks, leaves, buckets, and bowls: Distributional patterns of children's at-home object handling in two subsistence societies

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Penny Brown



Steve Levinson



Lizzie Mickiewicz



Anapaula Silva Mandujano



Mara Duquette



Elika Bergelson



Ine Alvarez van Tussenbroek



Cielke Hendricks

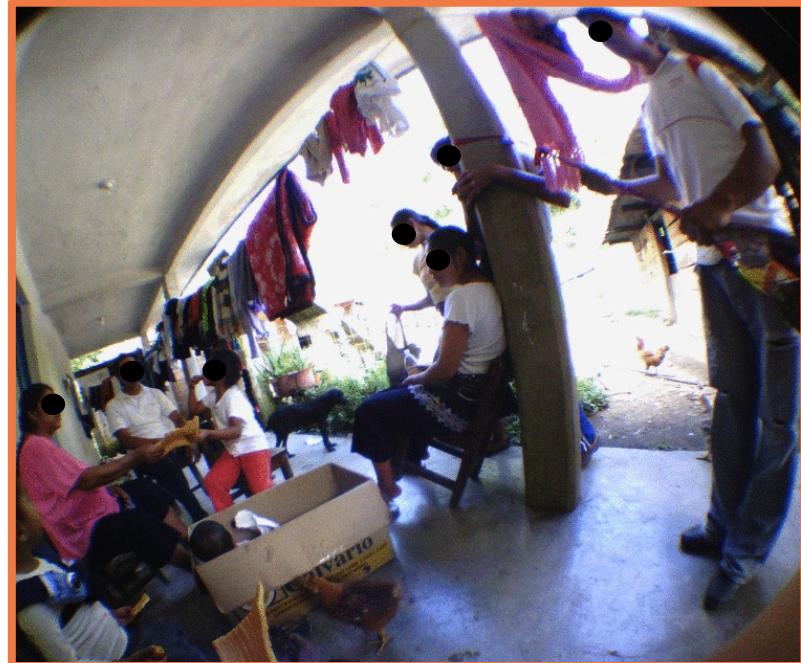


Will Fisher



Shawn Tice

# First-person object handling experience



7mo, Tseltal Mayan



11mo, Rossel Papuan



11mo, NY American

# First-person object handling experience



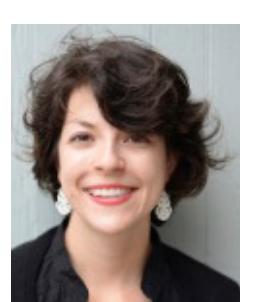
**7mo, Tseltal Mayan**  
cardboard packaging



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ball (carved from buoy)



**11mo, NY American**  
stuffed animal



# First-person object handling experience

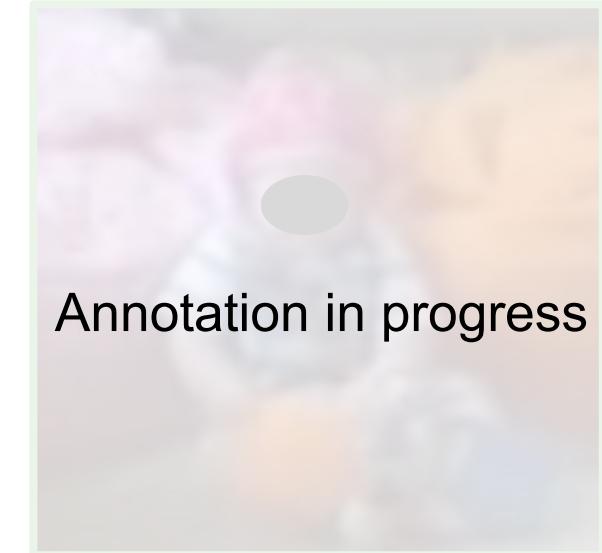


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cardboard packaging



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ball (carved from buoy)

Casillas et al., 2020, 2021



**11mo, NY American**  
stuffed animal

Bergelson, 2017

# Participating communities



# Object handling provides learning opportunities

- Perceptual properties
- Affordances
- Category membership
- Labels & other associated language

*Baumgartner & Oakes, 2011; Bornstein & Mash, 2010;  
Clerkin & Smith, 2022; Rachwani et al., 2020; Slone et al., 2019*

# Object handling changes with age

- Motor development
- Permitted object access

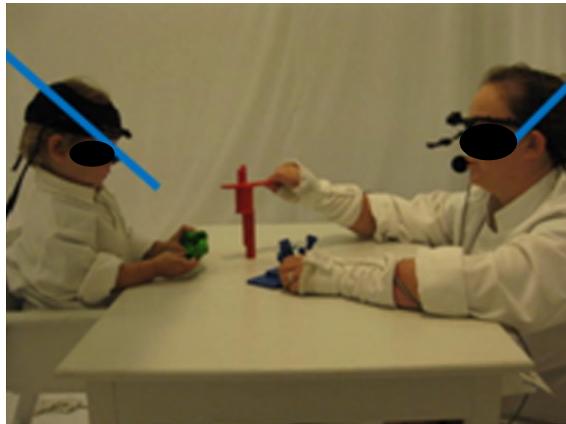
# Object handling varies across cultures

- Available objects
- Daily routines
- Child carrying practices

*Adolph et al., 2010; Arnold et al., 2012; Brown & Casillas, 2021; Casillas et al., 2020, 2021; Karasik et al., 2018*

# Current studies: Daylong object handling in two subsistence communities

4min (in-lab, US)



*Yu & Smith, 2013*

~2hr (at-home, US)



*Herzberg et al., 2022*

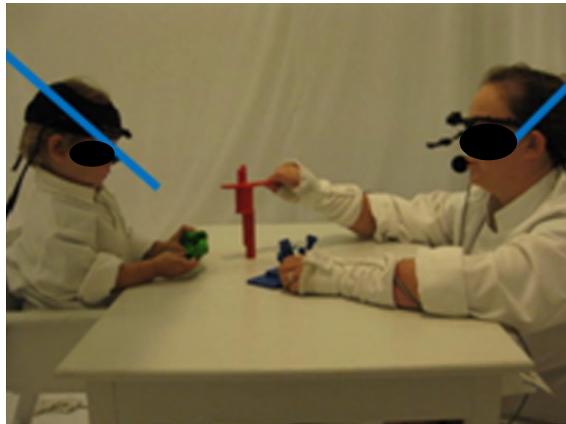
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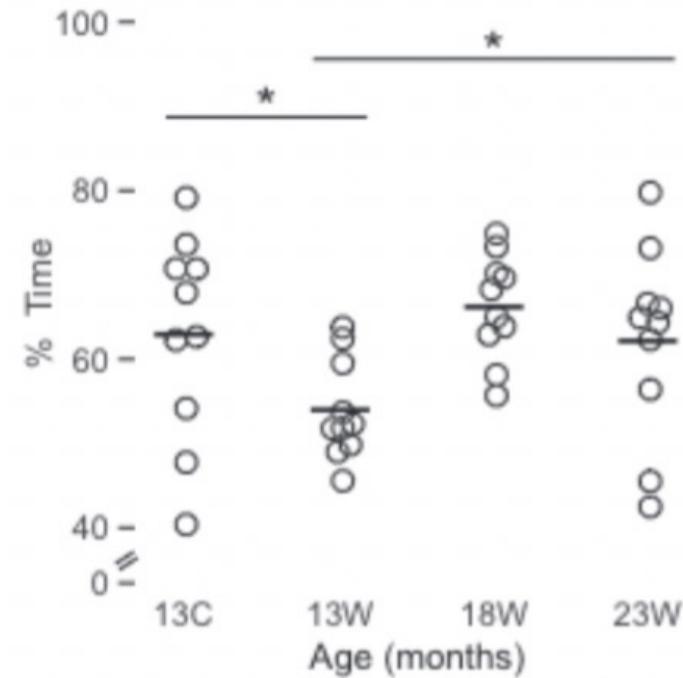
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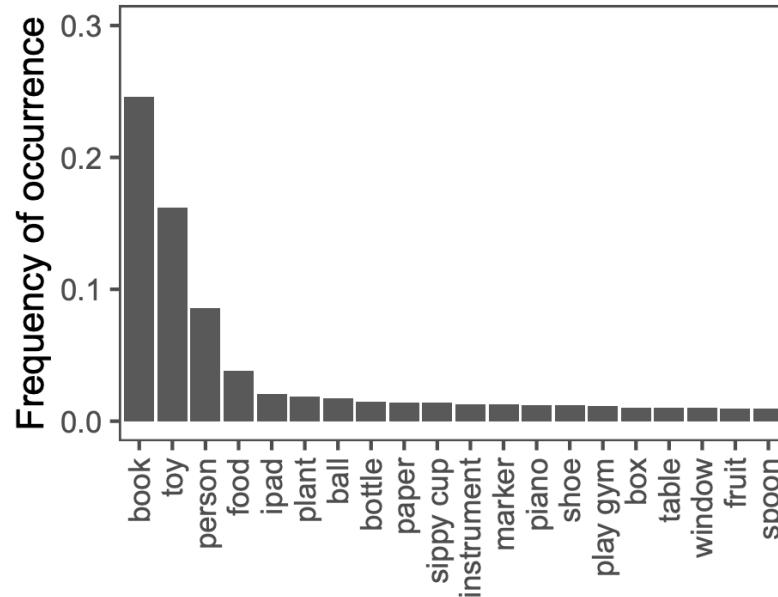
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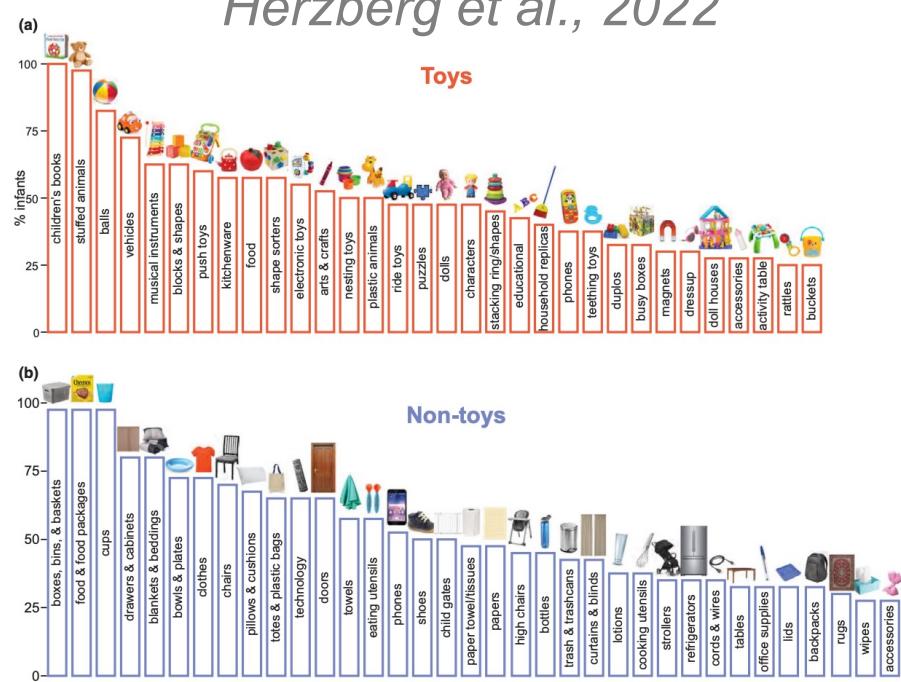
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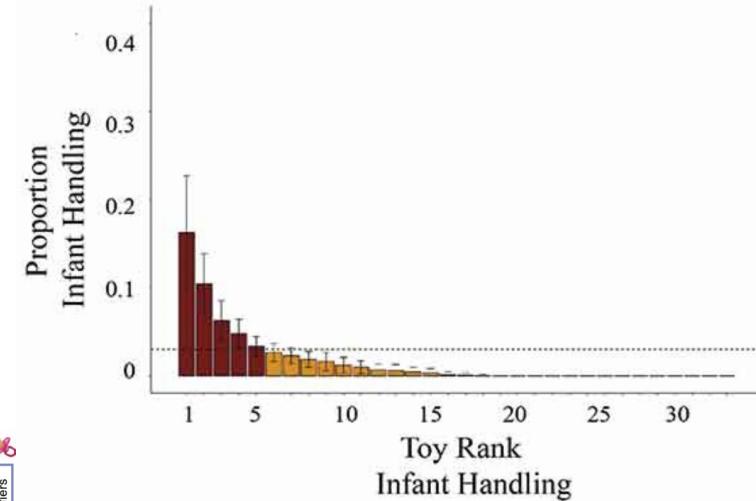
Long et al., 2021



Herzberg et al., 2022



Karmazyn-Raz & Smith, 2022



Zipf, 1965

# Participating communities



# Participating communities

## Differences

- Market integration
- Child carrying practices
- Day-to-day activities

**Tseltal Mayan**  
Chiapas, Mexico



**Rossel Papuan**  
Milne Bay Province,  
Papua New Guinea

## Similarities

- Rural, swidden horticulturalist
- Housed in multi-generation family complexes

# Photo sampling: Chestcams



Narrative Clip 1  
camera



Photojojo “super”  
fisheye lens  
(180° view)

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**35mo, Tzeltal Mayan**

# Photo sampling: Chestcams



Narrative Clip 1  
camera



Photojojo “super”  
fisheye lens  
(180° view)

81 children

- 0 – 48mo,  $M = 21\text{mo}$
- 38 Tseltal Mayan
- 43 Rossel Papuan

8 – 9 recorded hours/child

2 – 4 photos/minute

>111k total photos

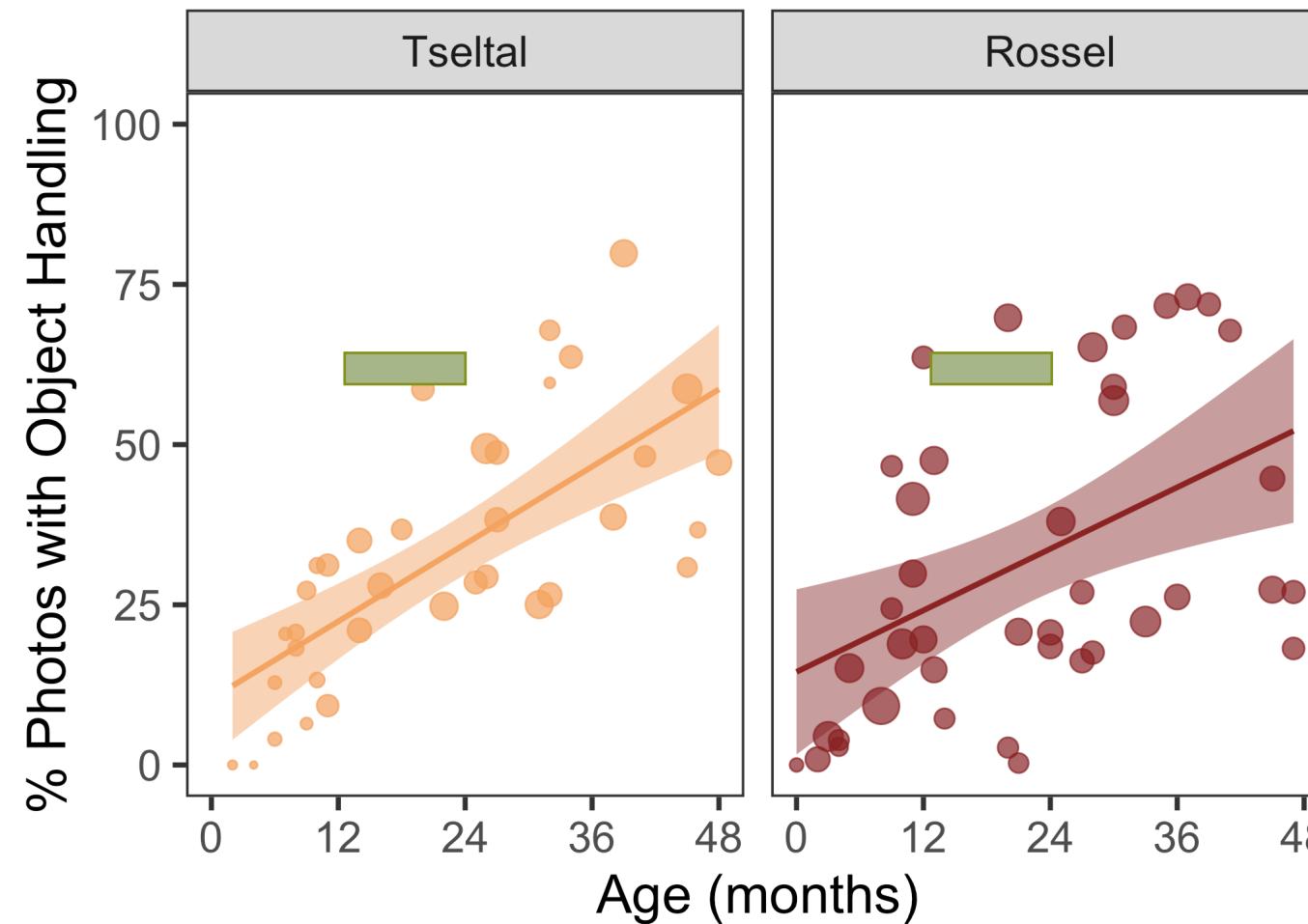
**Study 1: How frequent is object handling?**

**Study 2: What are the targets of object handling?**

# **Study 1: How frequent is object handling?**

$N = 81$ ,  $M = 490$  photos with hands (1 – 1,466)

# Study 1: How frequent is object handling?



- $M = 32.3\%$
- No effect of cultural context
- Significant increase with age

\*Dot sizes correspond  
to # of usable photos

Herzberg et al., 2022;  
Swirbul et al., 2022

**Study 1:** How frequent is object handling? ~1/3 of the recorded day

**Study 2:** What are the targets of object handling?

**Study 1:** How frequent is object handling?

**Study 2:** What are the targets of object handling?

# Study 2: What are the targets of object handling?

- Categories
- Types
- Tokens
- Effects of cultural context & age

Total >17k photos

$N = 77, M = 219 (1 - 631)$

# Categories

Mealtime Tool

Consumable

Work Tool

Toy

Clothing

Immovable

Natural

Synthetic

# Categories: Mealtime Tool



bowl



fork



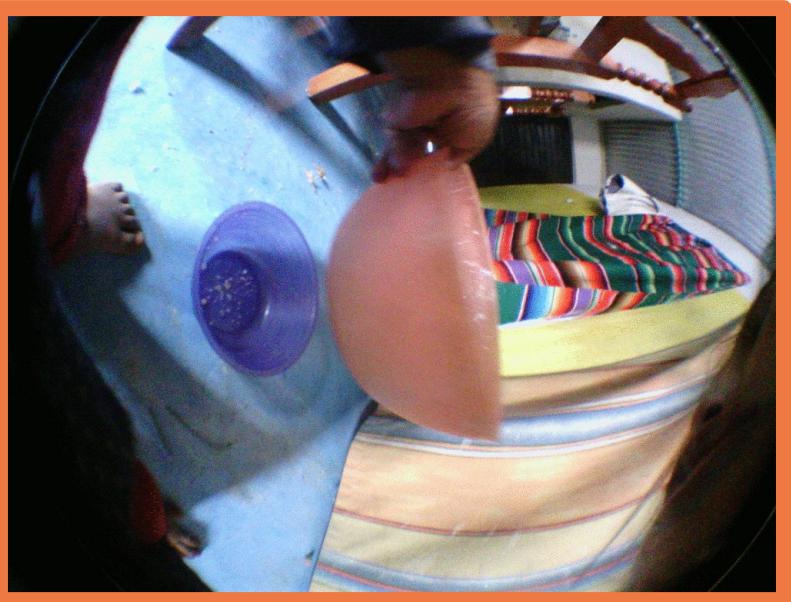
spoon



plate

# Types

# Types: Bowl



# Tokens



bowl1



bowl2



bowl3

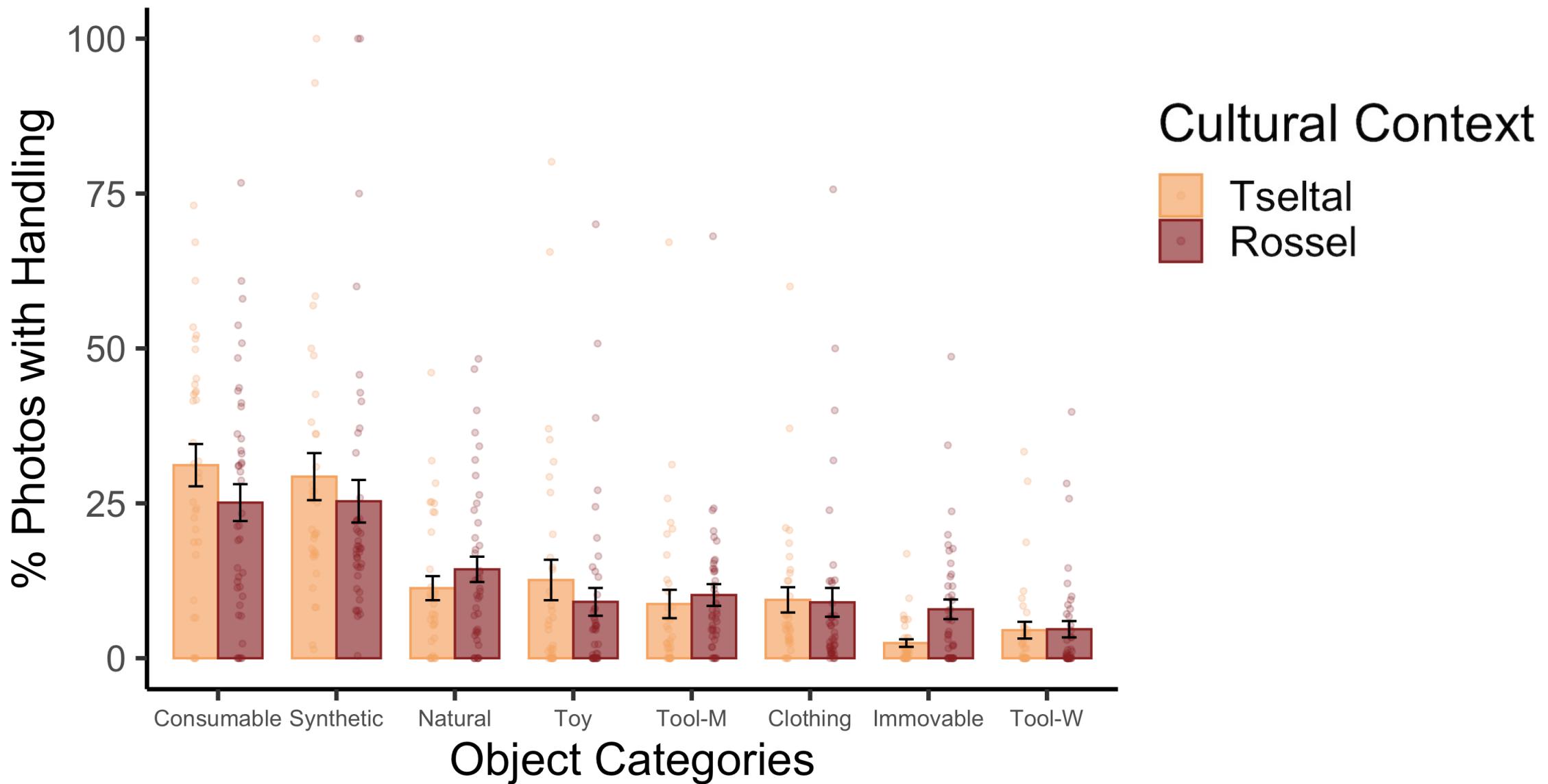
# Highlights

- **Categories:** Stable over age and across cultural contexts
- **Types:** Right-skewed distribution at the community and individual level
- **Tokens:** Cross-community differences

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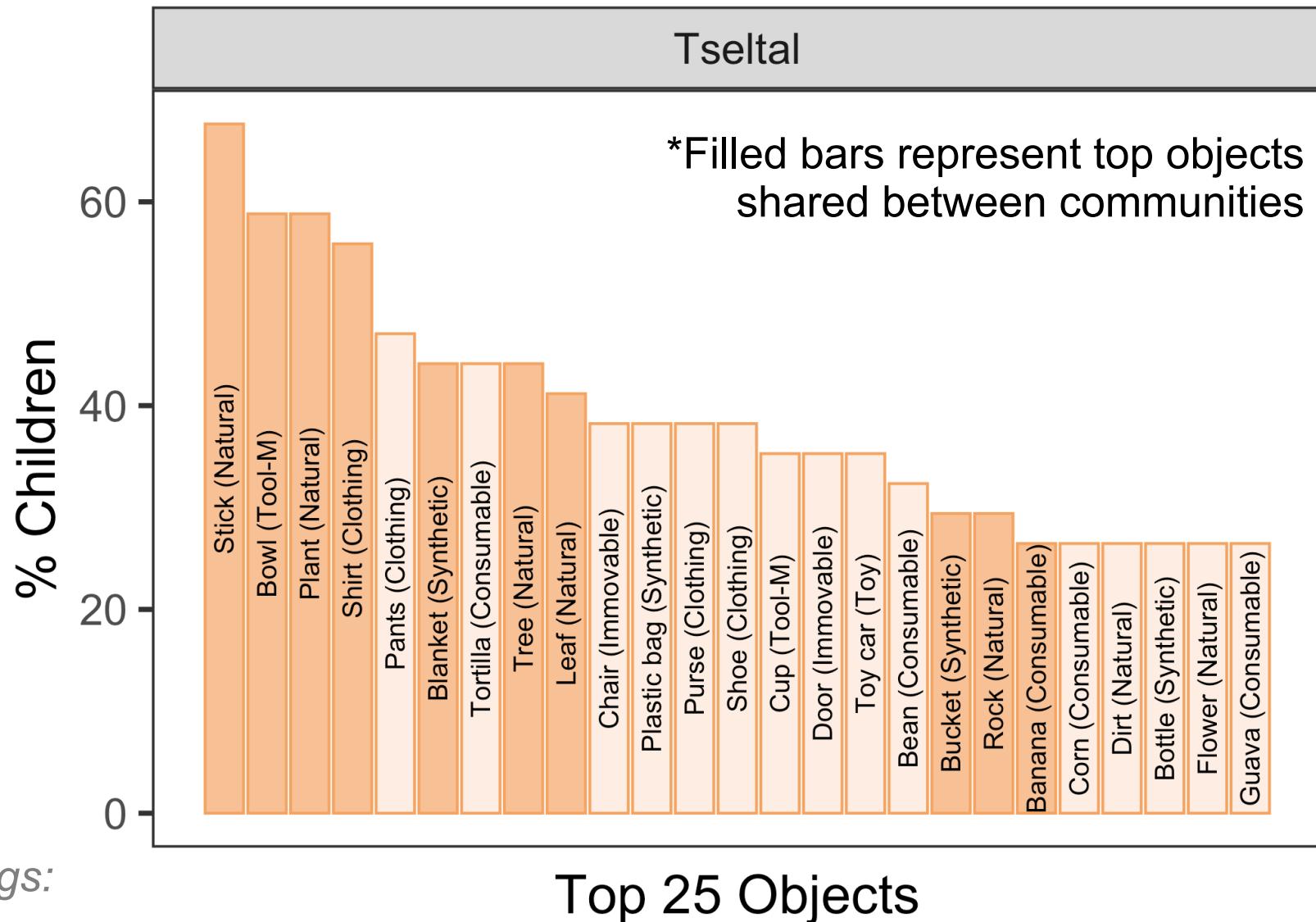


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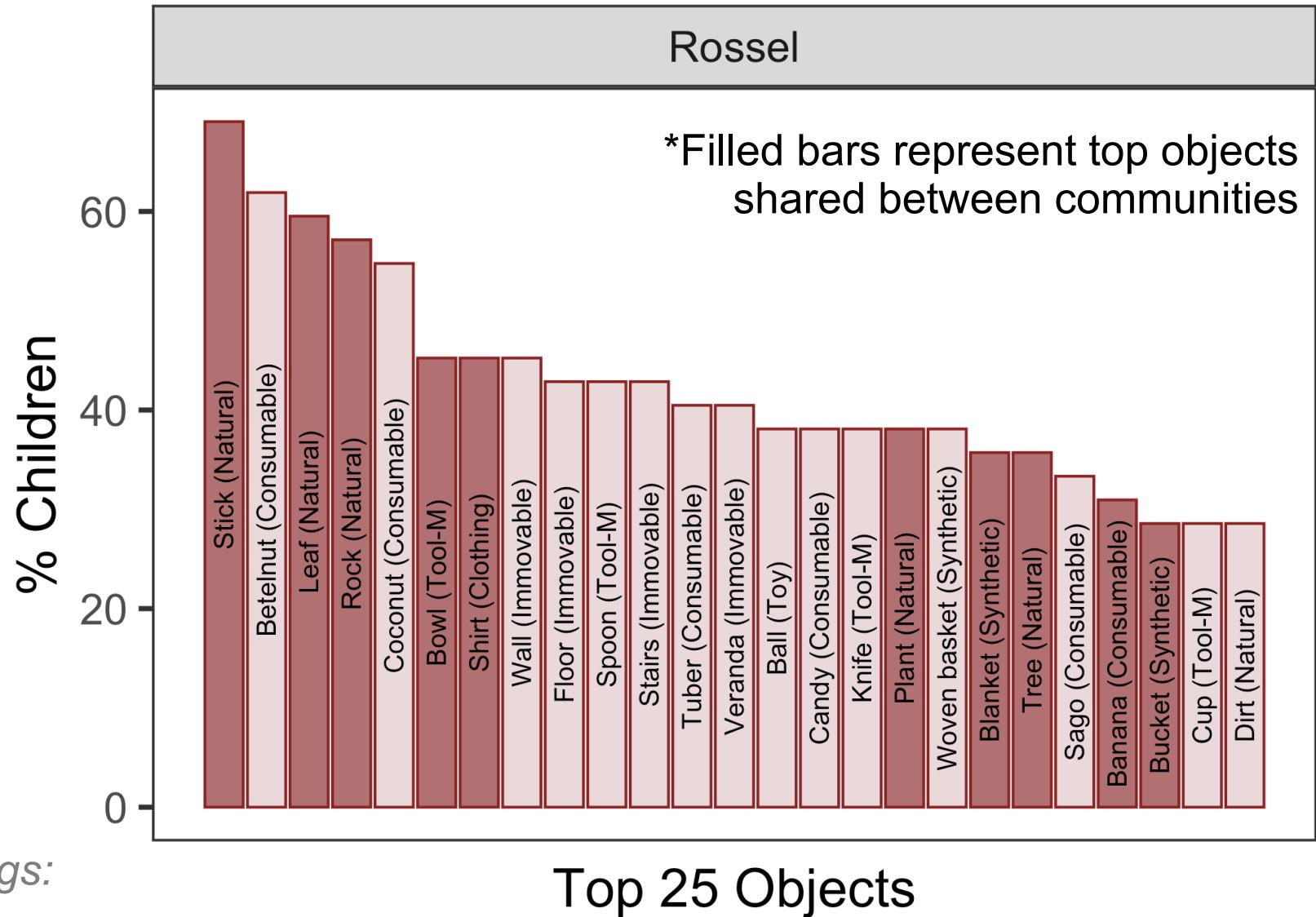
## Community level



*Trend consistent with US 2hr recordings:  
e.g., Herzberg et al., 2022*

# Types

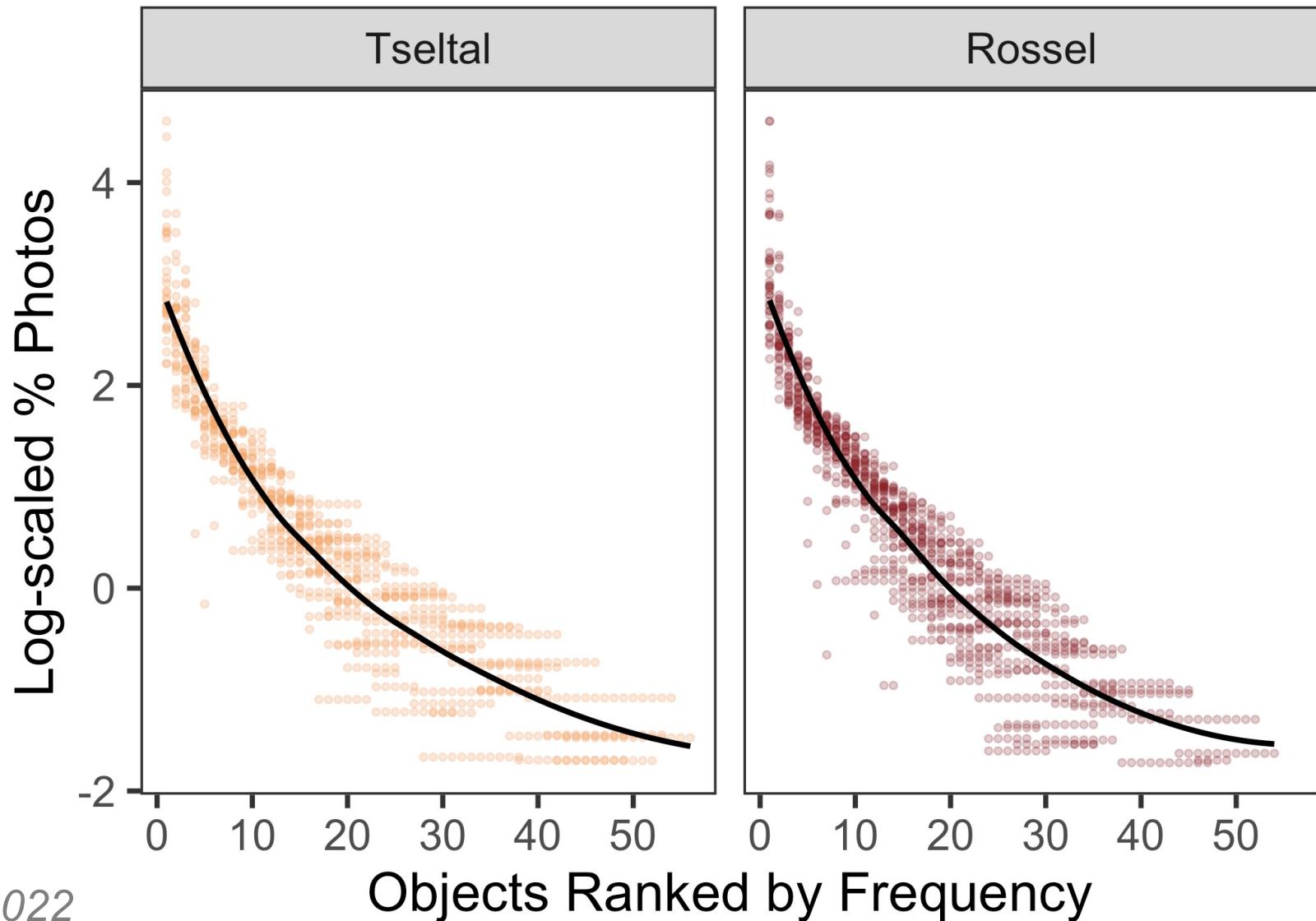
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# Types

## Individual level



# Highlights

- **Categories:** Stable over age and across cultural contexts
- **Types:** Right-skewed distribution at the community and individual level
- **Tokens:** Cross-community differences

# Tokens x Categories

Object Tokens/Hour

15

10

5

Consumable

Natural

Toy

Tool-M

Clothing

Immovable

Object Categories

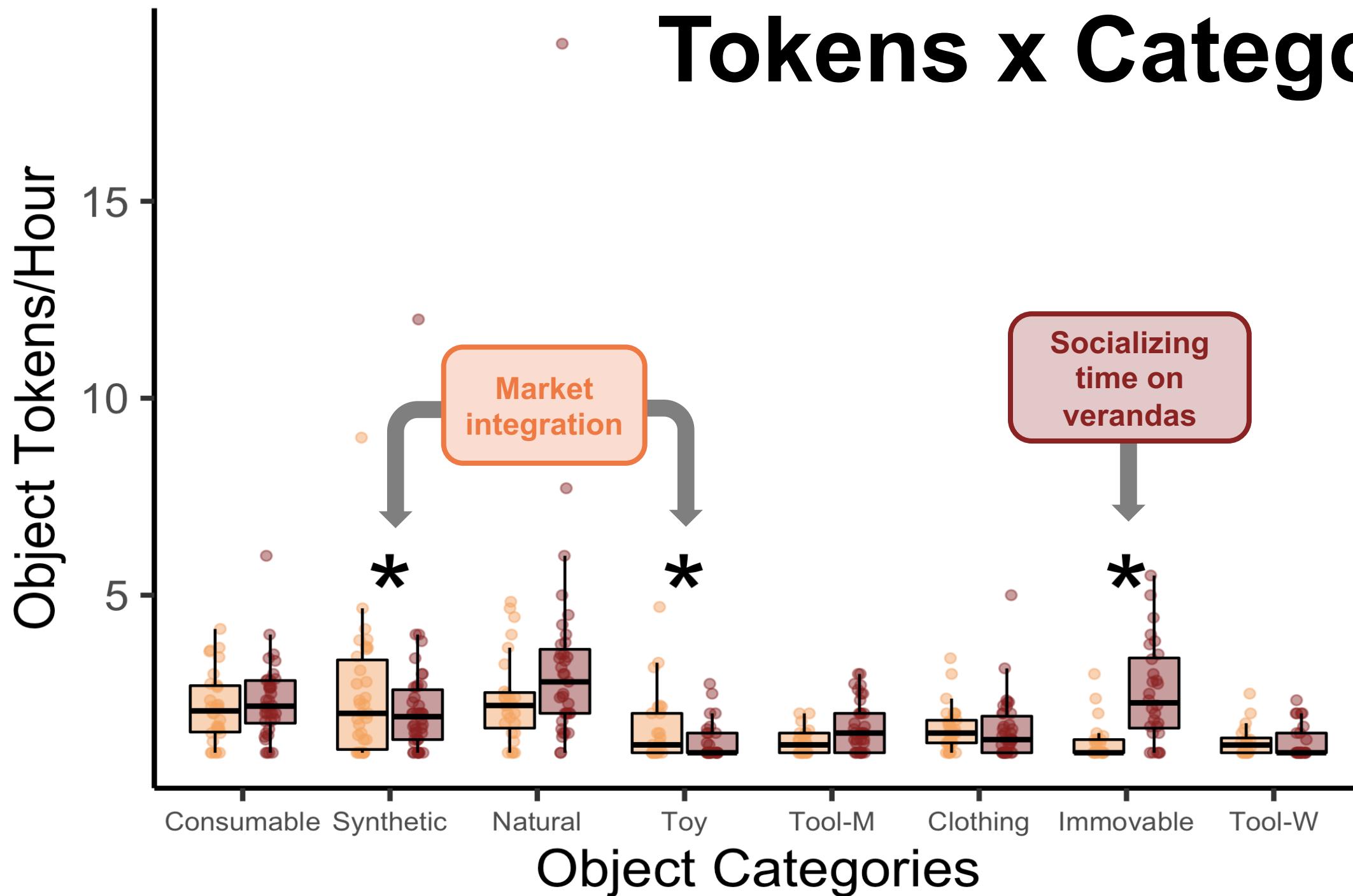
Market  
integration

Socializing  
time on  
verandas

\*

\*

\*



# Objects as insights into children's worlds

Stable

Variable

# Objects as insights into children's worlds

Stable

Variable

- Overall category prevalence
- Right-skewed distributions

*Herzberg et al., 2022; Karmazyn-Raz & Smith, 2022; Swirbul et al., 2022; Zipf, 1965; many others*

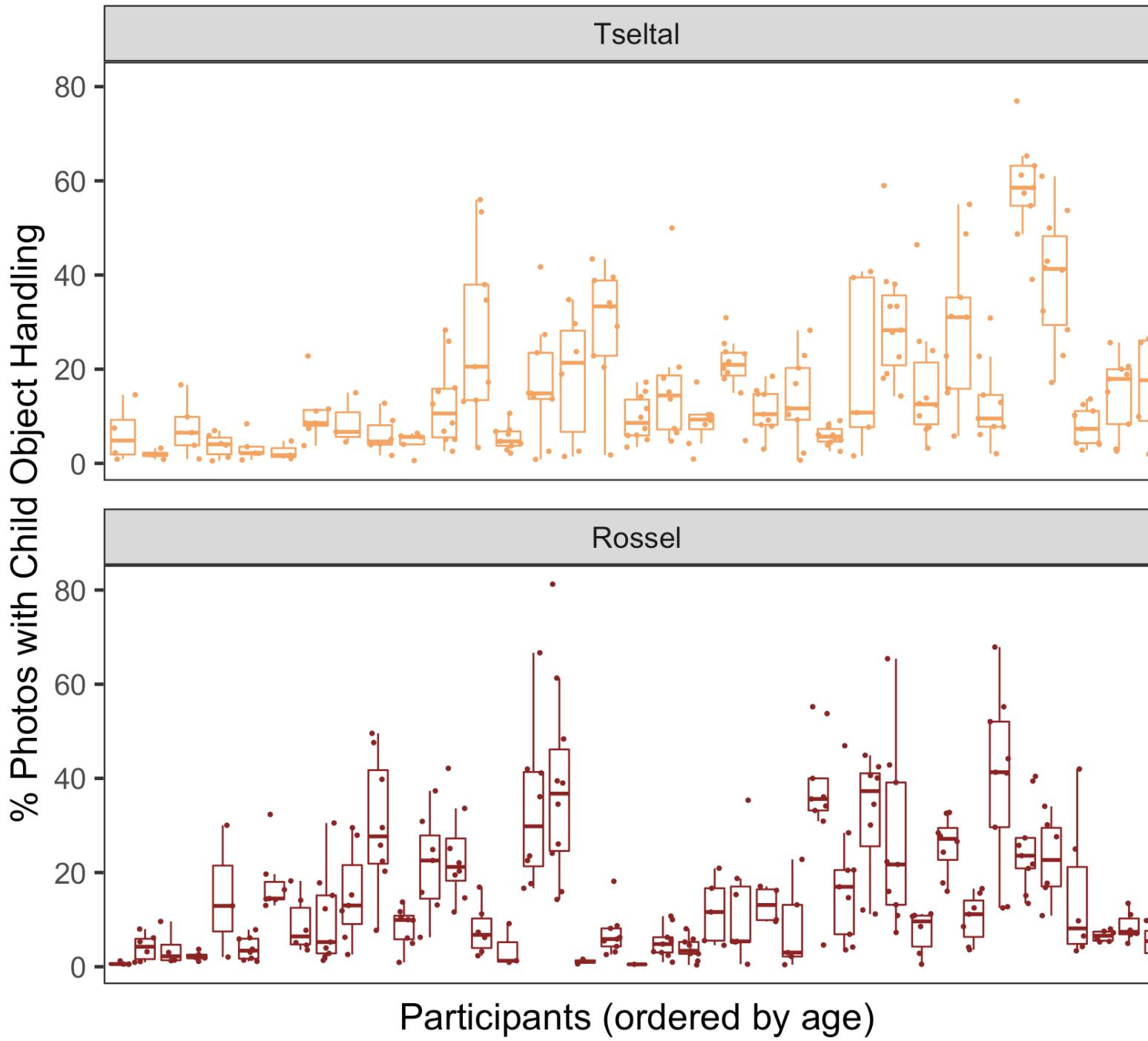
# Objects as insights into children's worlds

Stable

- Overall category prevalence
- Right-skewed distributions

Variable

- Rate of object handling
- Unique types/tokens



**~2hr (at-home, US)**



*Swirbul et al., 2022*

**~10min (at-home, US)**



*Clerkin & Smith, 2022*

**~2hr (at-home, US)**



*Herzberg et al., 2022*

# Objects as insights into children's worlds

Stable

- Overall category prevalence
- Right-skewed distributions

Variable

- Rate of object handling
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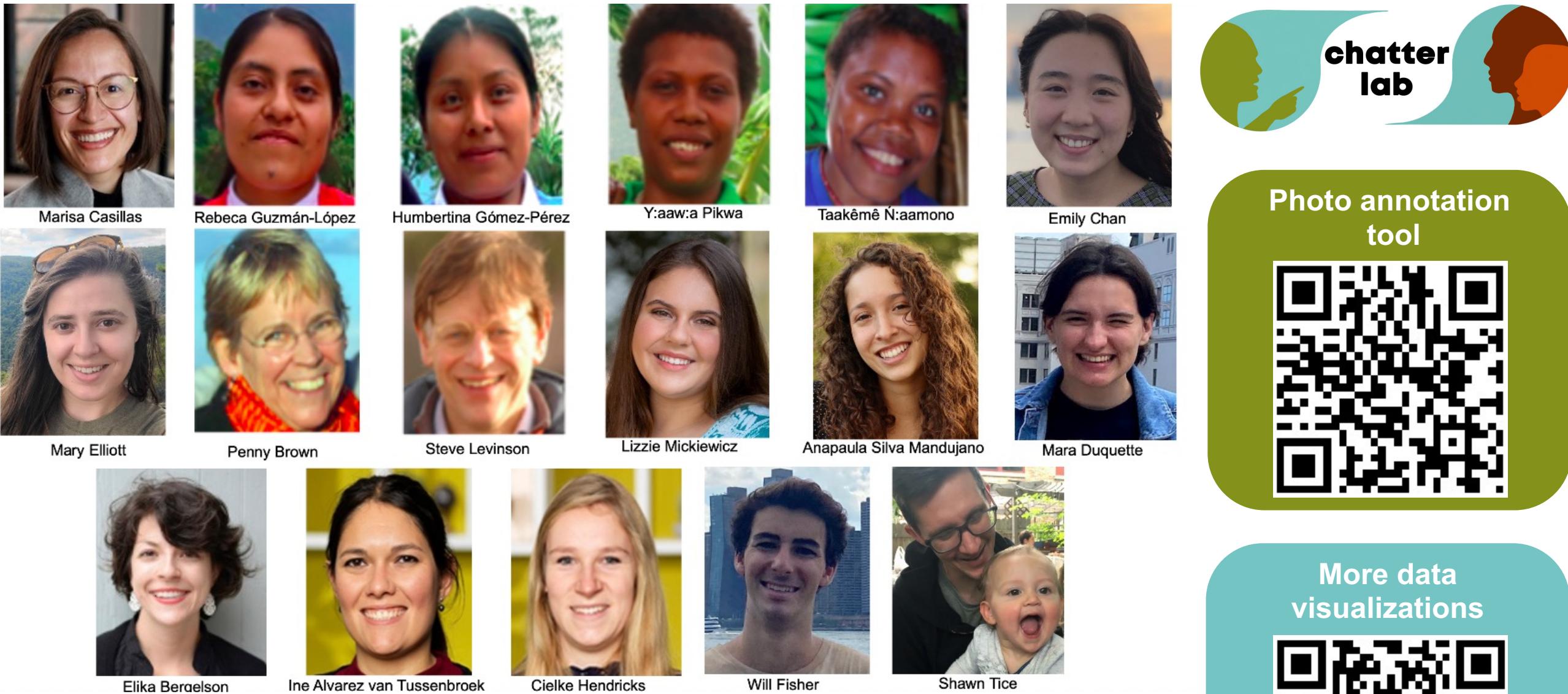


Photo annotation  
tool



More data  
visualizations



Thanks!