Early learning with picture books: novel noun acquisition during shared book-reading in 18- and 22-month-olds

Kristen Gilyard & Elika Bergelson, Psychology Department, Harvard University

Background

Babies understand **common nouns** (e.g. “nose”) more robustly after ~12mo. [1,2,3,4]
Toddlers can learn **novel words** in the lab (e.g. “blick”) in some circumstances but don’t retain these words well [5,6,7,8]

Home Book Reading provides a way to observe the word learning process over time during a naturalistic routine [9,11]

We’re providing protracted novel word exposure and measuring word learning (production & comprehension) at 2 ages: 18mo. and 22mo.

Research Questions:

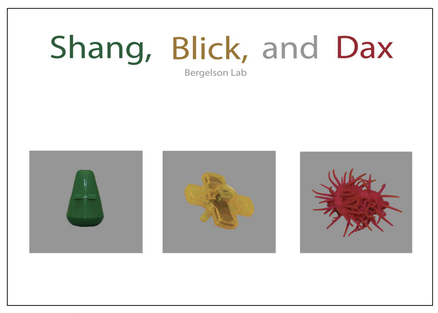
1) **Can toddlers produce 3 new words after a 2wk exposure?**
   a) **Does this vary by age?**
   b) **Does variability within naturalistic exposure predict word production?**
2) **Can toddlers comprehend novel words after a 2wk exposure?**
   a) **Does this vary by age?**

Predictions: Toddlers will learn new words but 22-mos will say and comprehend words faster and better than 18-mos due to their increased cognitive and language skills.

Methods

Caregivers read a new book containing 3 novel words: shang, blick and dax

Caregivers read the book with their infants 2/day for 2 weeks.



Participants (so far!): 40 dyads
- 18-mos (n= 20)
- 22-mos (n=20)

Caregivers were also provided picture cards of the objects
The book includes 9 instances of each novel word (~252 total exposures)

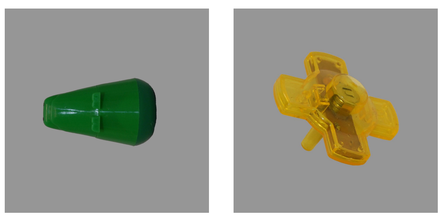
We transcribed the first 2, middle 3, and final 2 recordings for:

of **times each word was said** (by caregiver & by toddler)
of caregivers’ **extratextual extensions** [9,10]

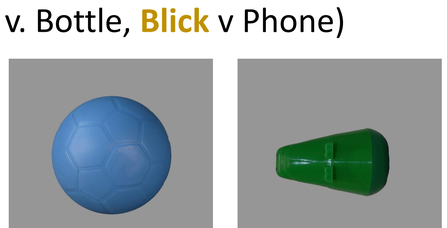
“Let’s count all of **those**!”
“What **color** is that?”
“Where do we put **this one**?”

Toddlers completed an eye-tracking word comprehension task

Novel-Novel Condition: (1st)
Each novel object was paired with every novel other object (e.g., **Shang** vs. **Blick**)



Novel-Familiar Condition: (2nd)
Each novel object was paired with a familiar object:
(**Shang** v Ball, **Dax** v. Bottle, **Blick** v Phone)

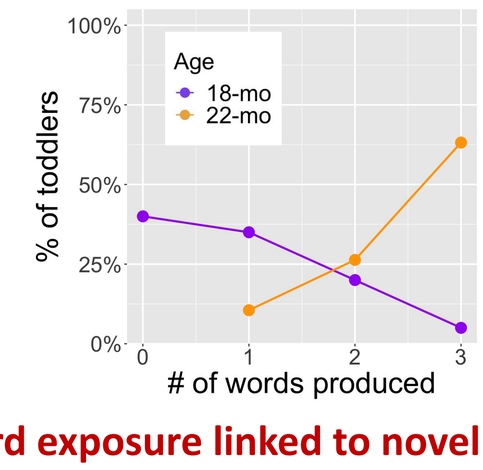


Results

18-mos and 22-mos produced novel words after 2 weeks

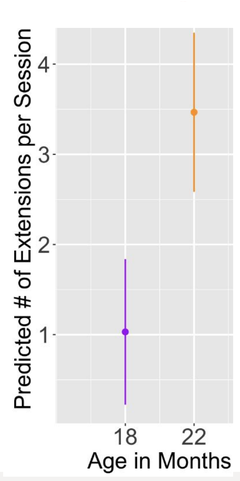
Avg. # of times caregivers said each novel word per session

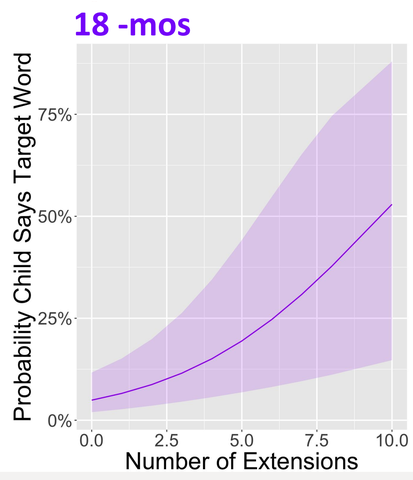
M(SD)	Caregivers of 18-mos	Caregivers of 22-mos
shang	9.2(2.2)	10.1(1.9)
blick	9(2)	9.8(1.9)
dax	9.1(1.9)	10(2.1)

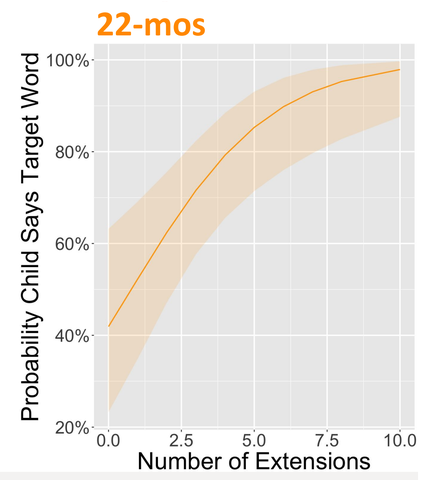


- *# of word exposures largely consistent across words and ages*
- *All 22-mos and >50% of 18-mos produced at least 1 new word during the 2 weeks*

Variability in word exposure linked to novel word production



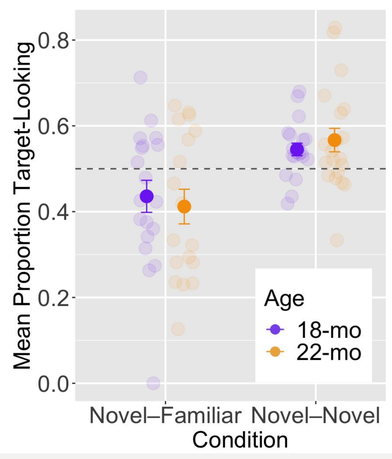


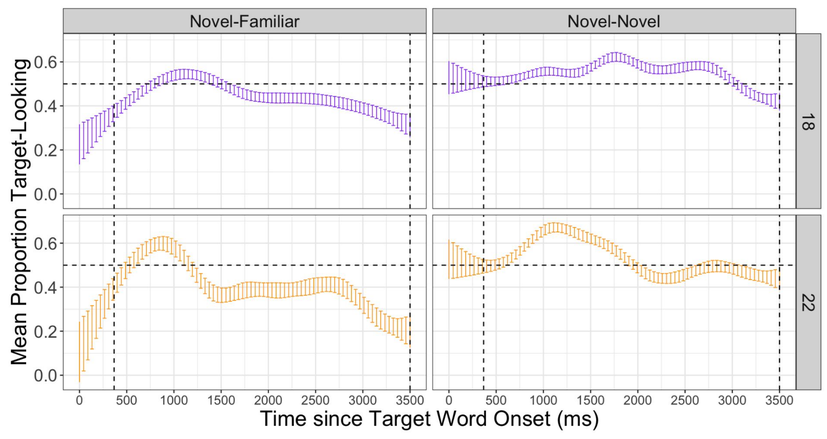


- *Caregivers of 22-mos use more extensions than Caregivers of 18-mos (p<.05 in LMM).*
- *As the number of caregiver’s extensions increased, the probability that their child said the target word increased significantly (p<.05). This holds for each age group.*
- *Caregivers of 22-mos (M=108.6 (35.1)) spent more total minutes reading than Caregivers of 18-mos (M=78.1(33.8)) (p<.05 in LMM). Time spent reading predicted likelihood of word production overall and for just 18-mos (p<.05).*

Logistic Mixed Effects Models: child_says_target ~ extensions_number + (1|child) & child_says_target ~ #_minutes_reading_total+ (1|child)

18-mos and 22-mos display some comprehension of novel words





- Toddlers looked in both age groups looked significantly more at the target in the Novel-Novel condition (p<.05) but not in the Novel-Familiar Condition.

Mixed Effects Model: mean_prop_looking ~ age_group + condition + (1 | Child)

Discussion

Can toddlers produce 3 new words after a 2wk exposure? Does this vary by age?

- Some can, and yes! The majority of 18-mos and 22-mos said at least 1 novel word after 2 weeks. However, >50% of 22-mos said all 3 words, while only a few 18-mos said all 3.

And, does variability within naturalistic exposure predict word production?

- Yes! More caregiver extensions linked to more likely word production. This held for both age groups, even though 22-mos received on average more extensions than 18-mos.

Can toddlers comprehend novel words after a 2wk exposure? Does age matter?

- It depends! Current eye-tracking data shows both 18- and 22-mos look more at the target in the more difficult Novel-Novel condition but not the Novel-Familiar condition. This differed from our original prediction! This is likely due to the salience of the familiar objects.

To further answer main questions:

- Data with 14-mos in progress
- Ongoing forced-choice novel word comprehension task

Questions? Comments? Contact: kristen_gilyard@g.harvard.edu

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