Are content nouns always better? Considering variable pronoun usage in children's acquisition of novel verbs

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Introduction

- Given *one exposure* to a novel verb, children can learn its meaning when it is surrounded by content nouns, but not pronouns (e.g., "The boy is *pilking* a balloon," versus "He is *pilking* it") (Arunachalam & Waxman, 2015)
- Variability helps learners, including in word-learning tasks (Naigles, 1996; Perry, Samuelson, Malloy, & Schiffer, 2010; Waxman & Klibanoff, 2000)
- Pronouns help children
  - Identify word boundaries (e.g., Mintz's Frequent Frames Hypothesis, Mintz, 2003)
  - Use a novel verb productively (Childers & Tomasello, 2001)

Hypothesis 1: Children will learn a novel verb's meaning better given both content nouns and pronoun contexts as compared to only content noun contexts.

However, this may not be uniform across children.

- Late Talkers: 2 year olds who are in the bottom 15th percentile in vocabulary measures with no comorbid deficits or known ideologies (Desmarais, Sylvestre, Meyer, Bairati, & Roulea, 2008)
- Late Talkers (LTs):
  - Are slower to identify familiar nouns at 18 months, indicating processing challenges (Fernald & Marchman, 2012)
  - Cannot use fast-mapping to learn the meanings of novel nouns at 30 months, indicating word-learning difficulties (Ellis Weismer, Venker, Evans, & Moyle, 2013)
  - Have different verb vocabularies, indicating possible differences in verb acquisition (Horvath, Rescorla, & Arunachalam, under revision)

Hypothesis 2: Because variability is likely to incur greater processing demands, LTs may benefit more from repetition than typically-developing children (TDs).

Participants

- Ages 24 to 35 months, mean age 28 months
- TD N = 18, LT N = 7
- LTs identified by scores at or below 15th percentile on Macarthur-Bates Communicative Development Inventories (MCDI-2)
- LT and TD groups differ on measures of expressive and receptive language (MCDI-2, Preschool Language Scales) and in their non-verbal cognition (Mullen Scales of Early Learning, Visual Reception Subscale)

Methods

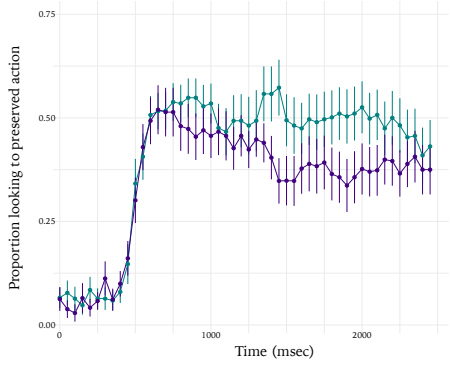
	Familiarization	Preview	Prompt	Test
Visual		 	★	 *Preserved object*  *Preserved action*
Auditory	Same condition: The girl is gonna *ziff* the truck. The girl is *ziffing* the truck!	Look!	Let's find *ziffing!*	Where's *ziffing?*
	Varied condition: The girl is gonna *ziff* the truck. She is *ziffing* it!			

Design

- Paradigm similar to other verb learning studies (e.g., Arunachalam & Waxman, 2015; Imai et al., 2005).
  - In Arunachalam & Waxman (2015), children succeeded with stimuli similar to the Same Condition, but with only one exposure.
- Within-subject design, 4 trials each of 2 conditions, 8 exposures to the verb during Familiarization
  - Same Condition: only content nouns
  - Varied Condition: content nouns and pronouns

Results

Same versus Varied Conditions, Both Groups

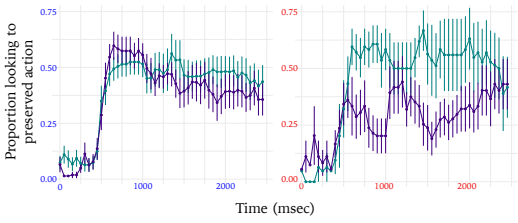


Analysis

- Time window of analysis: 1-2.5 seconds (following Arunachalam, 2013)
- Mixed-effects regression, with
  - Random effects of participant (with a random slope for time) and trial (with a random slope for time)
  - Fixed effects of time by group by condition
  - A dependent variable of proportion looking to the target versus elsewhere (including track loss and non-scene looks)

- **Finding: Main effect of condition (t = 2.3, p = 0.01), but not of group (t = 1.4, *n.s.*) or group by condition (t = -1.0, *n.s.*).**

Typically Developing Children | Late Talkers



Conclusions

Main finding:

- Children perform better when given only content nouns, rather than a mixture of content nouns and pronouns
- For 2-year olds, the benefits of content nouns in acquiring verb meaning override potential benefits of variability.

Typically-Developing children vs. Late Talkers:

- No significant difference between TDs and LTs, and no significant interaction
- Group difference trends in expected direction and may emerge with a larger sample size

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