

# Can Children's Verb Biases be Overcome? A Priming Study

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## BACKGROUND

**Goal of the Study:** Investigate whether children's interpretation of sentences with PP-attachment ambiguities can be primed against verb-based attachment biases by producing sentences with an unambiguous meaning.

### Globally Ambiguous Sentences / PP-Attachment Ambiguity

(1) The lion chooses the pig with the ruler.

#### VP Attachment / Instrument:

The lion uses the ruler to choose the pig.

#### NP Attachment / Modifier:

The lion chooses the pig that is holding a ruler.

### Comprehension Priming

- Adults' interpretation of PP-attachment ambiguities primed by comprehension & production [1]
- 3- to 6-year-olds primed (e.g., [2-4]) but research has focused on structural alternatives with similar meanings – active vs. passive; dative alternation
- Production-priming is robust (e.g., [2,3]); comprehension-priming is seldom utilized (e.g., [4])

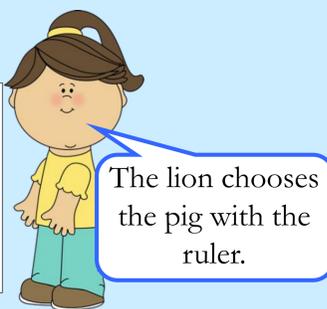
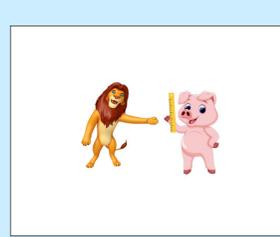
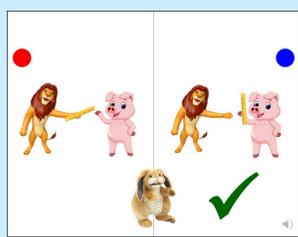
### Verb Biases

- 5-year-olds rely on verb biases, even when the visual context supports the alternate interpretation [5]

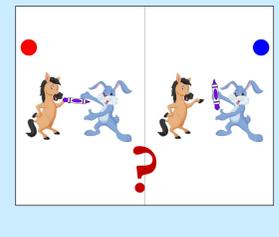
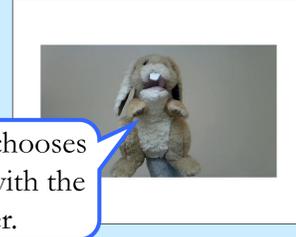
**Main Questions:** Can 4- to 6-year-olds be primed toward a particular interpretation of a globally ambiguous sentence? Can this priming overcome verb-based biases toward the less frequent NP attachment / modifier interpretation?

## PICTURE SELECTION TASK

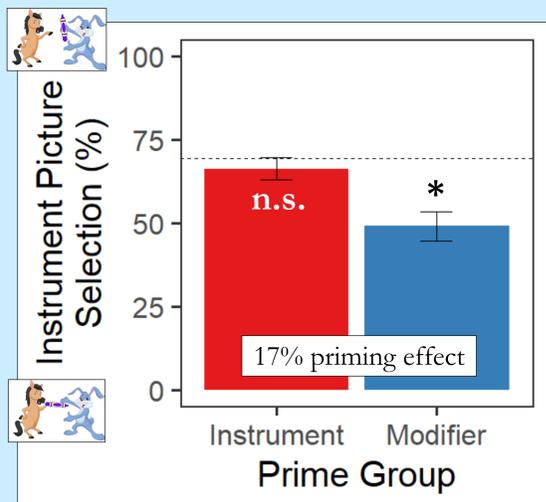
### Prime Trial



### Target Trial



## RESULTS



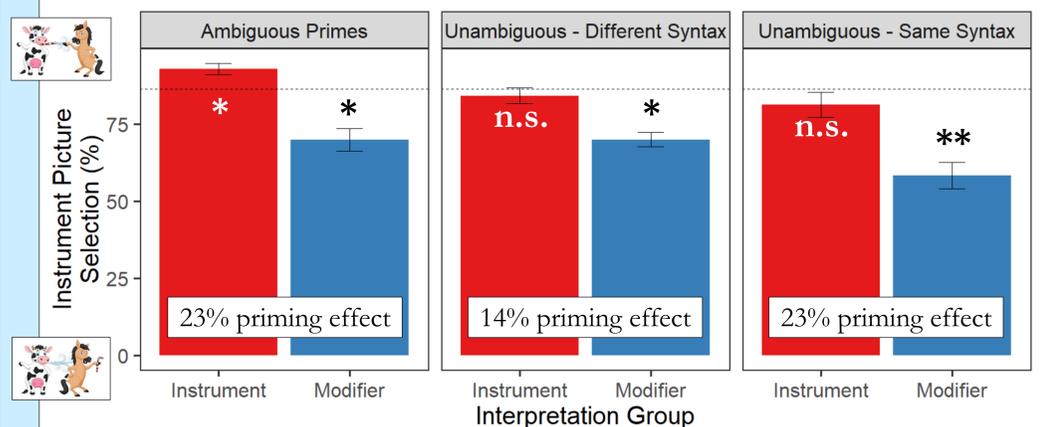
- Overall preference for the **instrument** interpretation (baseline = 69.53%)
- **Modifier** prime group selects instrument interpretation less often ( $\beta = 0.36, Z = 2.79, p < 0.01$ )
- No age related effects ( $\beta = 0.09, Z = 0.41, p > 0.1$ )
- **Modifier** group significantly different from **baseline**, but **instrument** group is not

**Prime** (n = 8): "The lion chooses the pig with the ruler."

**Effect Size:** Medium (Cohen's  $d = 0.78$ , 95% CI = 0.03-1.53)

- Compare to large effect for ambiguous primes & equi-biased verbs (Cohen's  $d = 1.26$ , 95% CI = 0.47-2.05)

### Previous Study: Equi-Biased Verbs [6,7]



### Prime Types (n=8 each):

- **Ambiguous** – "The elephant blows on the monkey with the fan."
- **Unambiguous (Different Syntax)** – "The elephant blows on the monkey **by using** / **that has** the fan."
- **Unambiguous (Same Syntax)** – "The elephant blows on **him** / **the one** with the fan."

## METHODS

### Priming Study

**Participants** 32 children, mean age = 5;7, range 4;8 – 6;4

**Modifier-Biased Verbs** (from [5]) choose / look at / listen to / yell at / sing to / find / talk to / hug

### Control Study

- Children have access to both interpretations [8], but need to establish a baseline preference (see also [6,7])

**Participants** 16 children, mean age = 5;0, range 4;1 – 6;3

**Target Sentences** (n = 8) Ambiguous target trials without the preceding prime sentence

**Filler Sentences** (n = 16) Sentences with a different structure & verbs than the targets (e.g., The frog and the rabbit eat the bread)



## DISCUSSION & CONCLUSION

**Main Findings:** Comprehension-priming is possible when the structure of the prime is globally ambiguous. The modifier group was primed toward the modifier interpretation, but this matches the supposed verb bias.

**Verb Bias:** Difficult to interpret!

- Children in the modifier group were primed against the instrument-prefering baseline
- Not unexpected, as priming is often limited to less common structure / interpretation
- BUT, these verbs are supposed to be modifier-biased!
- Priming toward their "bias," not against it

**Baseline Preferences:** Despite being categorized as modifier-biased by adults' judgments [5], children still prefer instrument interpretation. May be a pragmatic effect based on particular images used, but this would contradict the findings of [5] in which 5-year-olds ignore visual context for verb bias.

### Future Directions:

- In progress follow-up running unambiguous – same syntax condition with modifier-biased verbs: "The lion chooses **him** / **the one** with the ruler."
- Given strong instrument interpretation preference, is it possible to prime against this interpretation paired with instrument-biased verbs?