

Priming Children's Interpretation of Globally Ambiguous Sentences

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BACKGROUND

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

Globally Ambiguous Sentences / PP-Attachment Ambiguity

(1) The elephant blows on the monkey with the fan.

VP Attachment / Instrument: The elephant uses the fan to blow on the monkey.

NP Attachment / Modifier: The elephant blows on a monkey that is holding a fan.

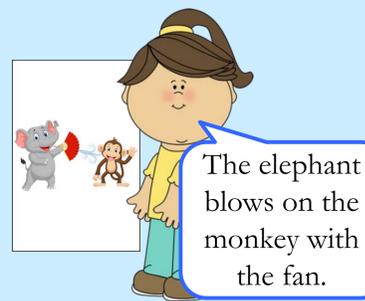
Comprehension Priming

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

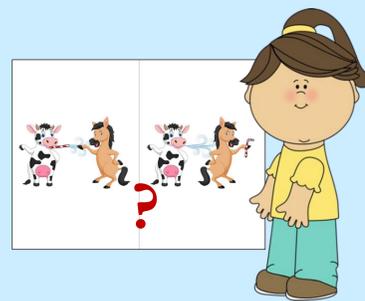
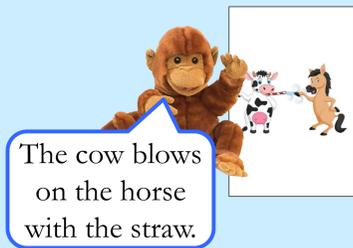
Main Questions: Can 4- to 6-year-olds be primed toward a particular interpretation of a globally ambiguous sentence? Is the strength of this priming affected by whether or not the prime sentence itself is ambiguous?

PICTURE SELECTION TASK

Prime Trial



Target Trial



PART 1: PRIMING STUDY

Participants 51 children, mean age = 5;7, range 4;5 – 6;7

Prime Sentences (between subjects, n = 8)

- Ambiguous:** "The elephant blows on the monkey with the fan."
- Unambiguous – Instrument:** "The elephant blows on the monkey by using the fan."
- Unambiguous – Modifier:** "The elephant blows on the monkey that has the fan."

Equi-Biased Verbs (from [5]) scratch / throw / pinch / feel / drag / turn over / blow on / point at

Interpretation Groups (between subjects)

Instrument: [VP blows on [the monkey][with the fan]]

Modifier: [VP blows on [the monkey with the fan]]

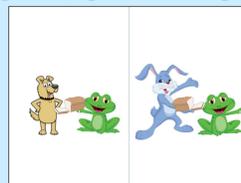
PART 2: CONTROL STUDY

- Children have access to both interpretations [6], but need to establish a baseline preference

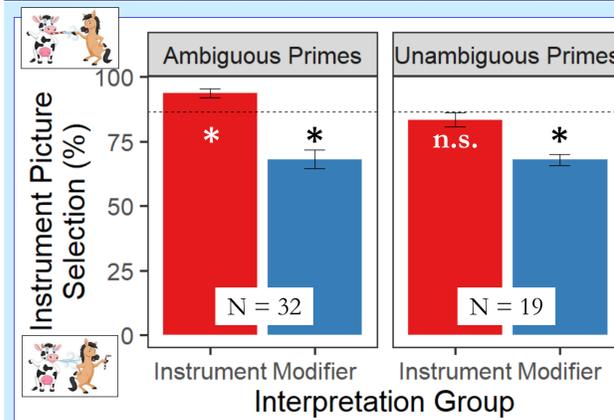
Participants 13 children, mean age = 5;3, range 4;1 – 5;11

Target Sentences (n = 8) Ambiguous target trials from Part 1 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)

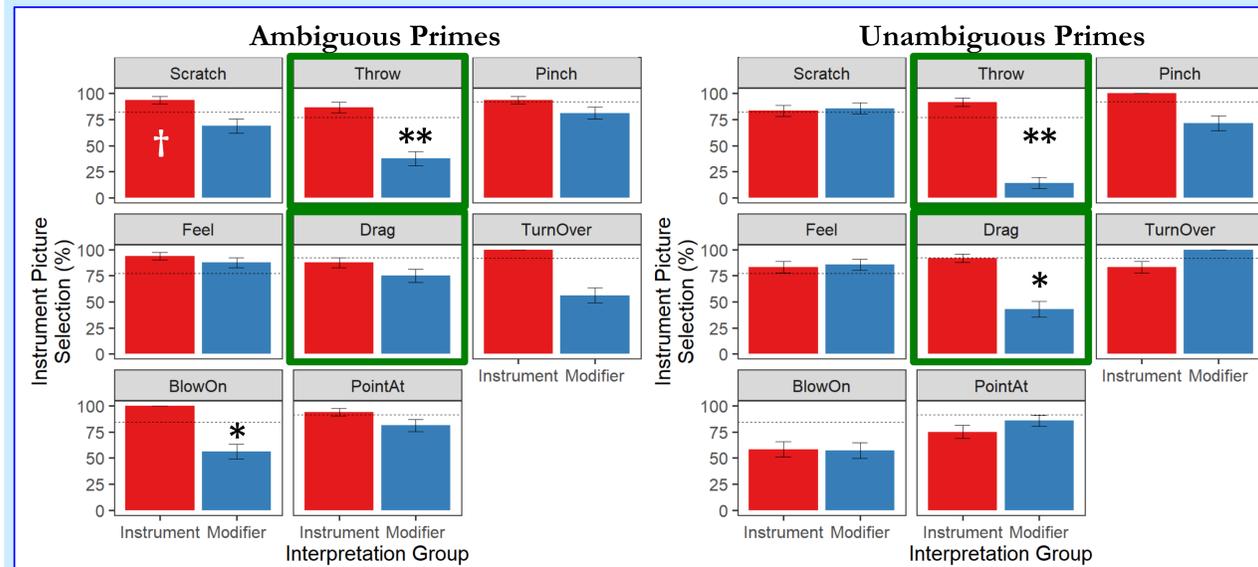


OVERALL RESULTS



- Overall preference for the **instrument** interpretation (baseline = 86.4%)
- Both **modifier** interpretation groups select the instrument interpretation less often ($\beta = 0.87, Z = 3.25, p < 0.001$)
- Older children marginally more likely to select the instrument interpretation ($\beta = 0.89, Z = 1.90, p = 0.058$)
- All groups** significantly different from **baseline** *except* the instrument interpretation group with unambiguous primes

INDIVIDUAL VERB RESULTS



- Consistent decrease in selection of instrument interpretation by **modifier** group for only **2 verbs**
- Only a few cases are significantly different from individual verb baseline selection rates

DISCUSSION & CONCLUSION

Main Findings: Comprehension-priming is possible when the structure of the prime is globally ambiguous. Priming occurs in both directions when the prime is ambiguous, but only modifier interpretations are primed when the prime is unambiguous.

Baseline Preferences: Children have consistently higher rates of instrument preferences compared to adults in [3]

Individual Verbs: Exploratory analyses, but overall effects may be driven by 2 verbs (throw / drag)

Future Directions

- Children solely rely on verb bias to interpret PP-attachment ambiguities [5] → can they be primed against these biases?
- e.g., priming modifier interpretations for instrument-biased verbs

Verb	Instrument Responses [5]
Scratch	75%
Throw	33%
Pinch	60%
Feel	50%
Drag	40%
Turn over	50%
Blow on	67%
Point at	40%

References: [1] Branigan, H., Pickering, M., & McLean, J. (2005). Priming prepositional-phrase attachment during comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 31(3), 468-481. [2] Huttenlocher, J., Vasilyeva, M., & Shimpi, P. (2004). Syntactic priming in young children. *Journal of Memory and Language*, 50(2), 182-195. [3] Savage, C., Lieven, E., Theakston, A., & Tomasello, M. (2003). Testing the abstractness of children's linguistic representations: Lexical and structural priming of syntactic constructions in young children. *Developmental Science*, 6(5), 557-567. [4] Thothathiri, M. & Snedeker, J. (2008). Syntactic priming during language comprehension in 3- and 4-year-old children. *Journal of Memory and Language*, 58, 188-213. [5] Snedeker, J. & Trueswell, J. (2004). The developing constraints on parsing decisions: The role of lexical-biases and referential scenes in child and adult sentence processing. *Cognitive Psychology*, 49, 238-299. [6] Zimmer, E. J. (2017). Children's comprehension of two types of syntactic ambiguity. *First Language*, 37(1), 7-23.