

Children assume an asymmetry in syntax indicates an asymmetry in meaning

Abigail Laver (Mentors: John Trueswell and Victor Gomes)
University of Pennsylvania



INTRO

- Symmetry is a feature of perception and logic
- This relation shows up in some words in natural language
 - Bill met Jane = Jane met Bill
 - Bill kicked Jane ≠ Jane kicked Bill
- Despite this, symmetrical predicates (meet, next to, etc.) include an asymmetry when they appear in transitive syntax:
 - “The bike is next to the garage” > “The garage is next to the bike”¹
 - Small, mobile objects → **Figure**
 - Large, immobile objects → **Ground**
 - Subject is Figure; Object is Ground
- **This is about sentence structure and not word order, since the figure-ground difference goes away with intransitives:**
 - The garage and bicycle are next to each other.
- 4- to 8-year-olds assume that an asymmetry in syntax indicates an asymmetry of meaning²
- Do 2- to 4-year-olds make the same assumption?
- If so, can they use this assumption to make hypotheses about word meaning?

METHODS

- 12 young (2y0m-3y5m), 7 old (3y6m-4y7m) participants
- Novel online preferential looking method through webcam
- Coded **eye gaze** and **word onset**
- Four **critical trials**
 - Scenes with two **unknown** objects (1 small, mobile and 1 large, immobile; see Figure 1)
 - Two between-subjects conditions for learning phase
 - Transitive (“The fep is next to the wug!”)
 - Intransitive (“The fep and the wug are next to each other!”)
 - Participants were asked to find the two objects (“Where is the fep?”)
- Where participants look after hearing nouns indicated which object they believed the noun labeled

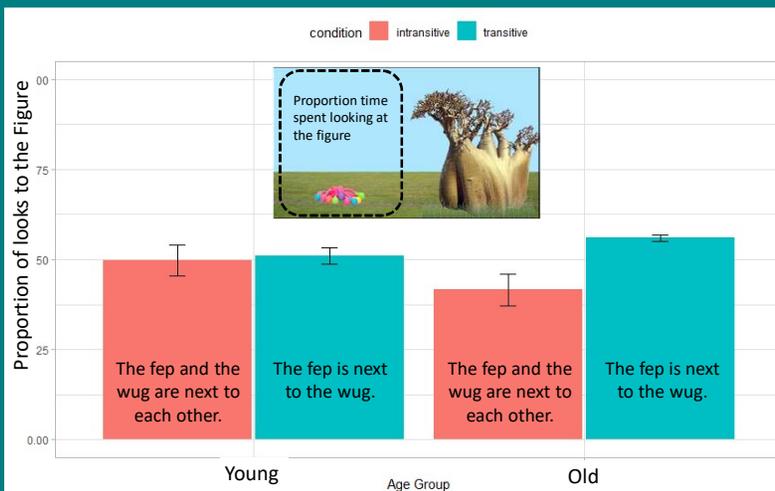


Figure 1. Example experimental trial



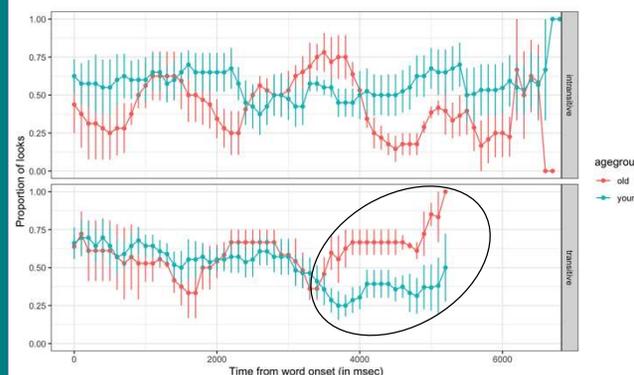
Figure 2. Example participant

Children over 3.5 years old assume that an asymmetry in syntax indicates an asymmetry in meaning and can use this to identify referents after hearing scene descriptions



Significant fixed effects of condition ($\beta = 0.164$, $z = 2.45$, $p = .014$) and the interaction of condition and age group ($\beta = 0.135$, $z = 2.02$, $p = .043$)

RESULTS



- Older children were more likely to look to the Figure at the end of the learning phase
- No evidence that children learned the meaning of novel nouns
 - No significant fixed effects of condition ($z = 1.27$, $p = .204$) or the interaction of condition and age group ($z = 0.10$, $p = .923$) during test phase

DISCUSSION

- Children 3.5 years and older assume that asymmetry in syntax corresponds to an asymmetry in meaning and can use this knowledge to identify referent objects
- Hypothesis that children would use this knowledge to make inferences about word meaning was not supported
 - Maybe children really can't do this
 - Underpowered
 - Task may be too difficult because children were asked to learn two nouns per trial

REFERENCES

1. Chestnut, E. K. & Markman, E. M. (2016). Are horses like zebras, or vice versa? Children's sensitivity to the asymmetries of directional comparisons. *Child Development* 87(2), 565-582.
2. Gleitman, L. R., Gleitman, H., Miller, C., & Ostrin, R. (1996). Similar, and similar concepts. *Cognition* 58(3), 321-376.

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