

Comprehension of conjunction by English-speaking adults and children

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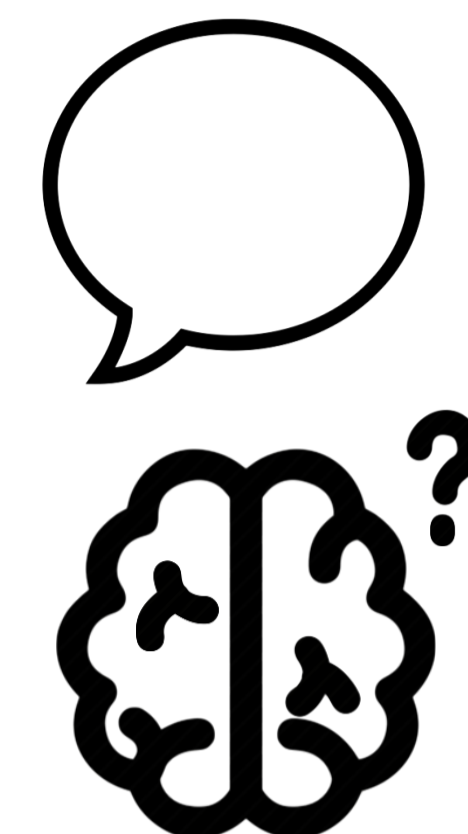
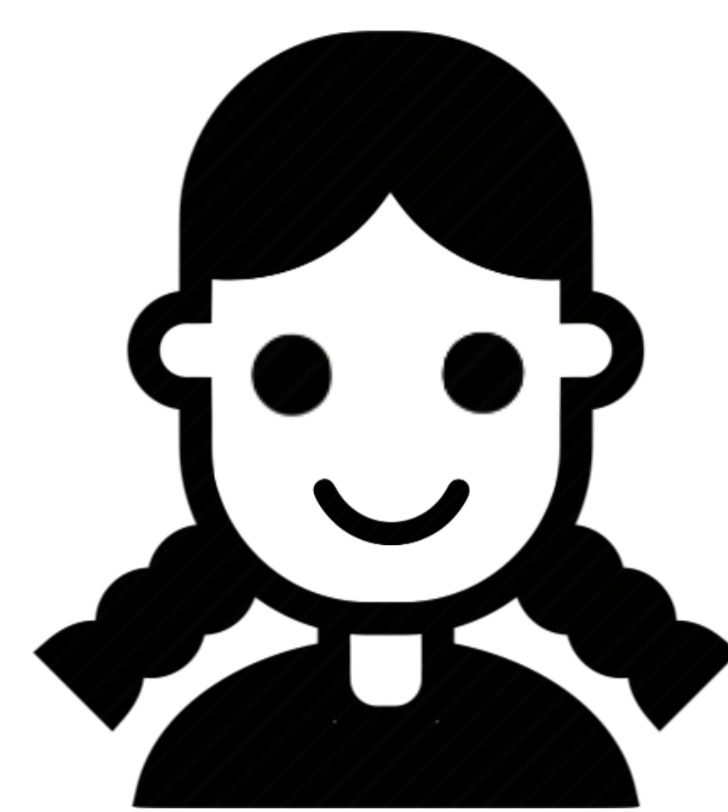
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The acquisition of *and*

And presents a challenging case for language acquisition due to its cross-categorical flexibility:

- a. Anna and Bill laughed.
- b. Anna jumped and laughed.
- c. Anna jumped and Bill laughed.

NP-*and*
VP-*and*
S-*and*



Production:
as early as 2 years old

Comprehension:
much less understood

Question: Is there a developmental asymmetry between different *ands*? If so, is S-*and* acquired first?

The Somebody Experiment

- **Stage:** 3 characters, 2 objects
- **ConjunctionType:** S-*and* vs. NP-*and*
- **Set-up:** Match vs. Mismatch
- Experimental procedure:
 - Experimenter A says to Wilbur: *Okay Wilbur, make it so that*
 - **S-*and*:** [Somebody has a carrot] **and** [somebody has a donut].
 - **NP-*and*:** Somebody has [a carrot **and** a donut].
 - Experimenter B sets up the scene behind the curtains.
 - When Wilbur finishes the set-up, Experimenter A lifts the curtains and asks the child: “Did Wilbur get it right?”
 - If the answer is no, the child participant is invited to fix the scene by moving around the objects on the stage.
 - Adult participants see an online version of this experiment that uses the same material and mimics this procedure closely.
- Results & Analysis in mixed-effect logit models:
 - Coded as *correct* iff
 - Answer *yes* in the **Match** condition
 - Answer *no* in the **Mismatch** condition + fix the scene correctly
 - Children: main effects of ConjunctionType ($b = 12.84, p < .001$) and Set-up ($b = 5.04, p < .05$), but no significant interaction between them ($b = -0.11, p = .97$).
 - Adults: a significant interaction between ConjunctionType and Set-up ($p < .05$)
- Possible interpretations:
 - Developmental asymmetry: S-*and* \gg NP-*and*?
 - A non-linguistic principle *Fairness!*:
 - The child desires to distribute objects among the characters as evenly as possible
 - Affecting the interpretation of the NP-*and* condition: Do children have an S-*and* interpretation of NP-*and*, or are they observing *Fairness*?

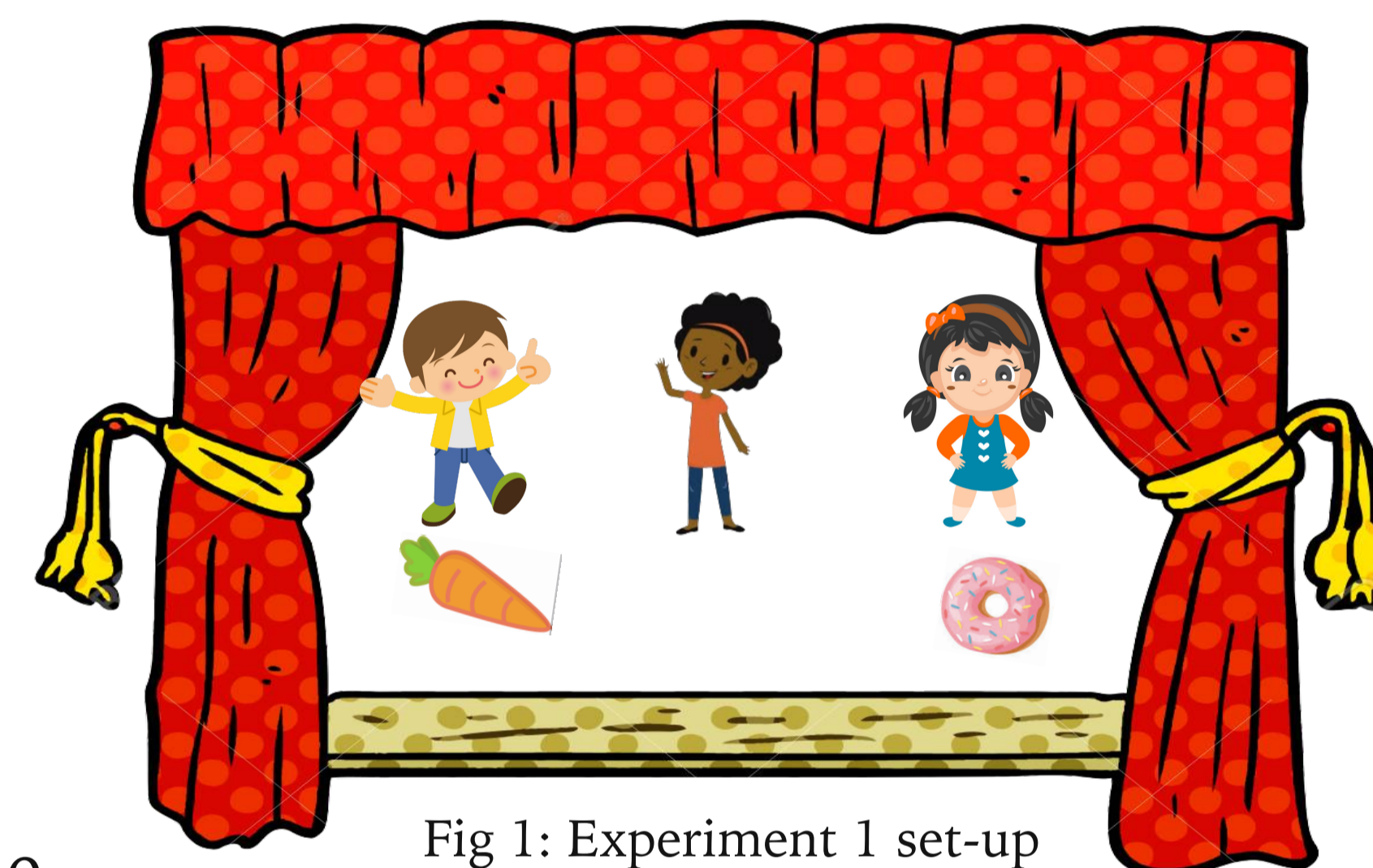


Fig 1: Experiment 1 set-up

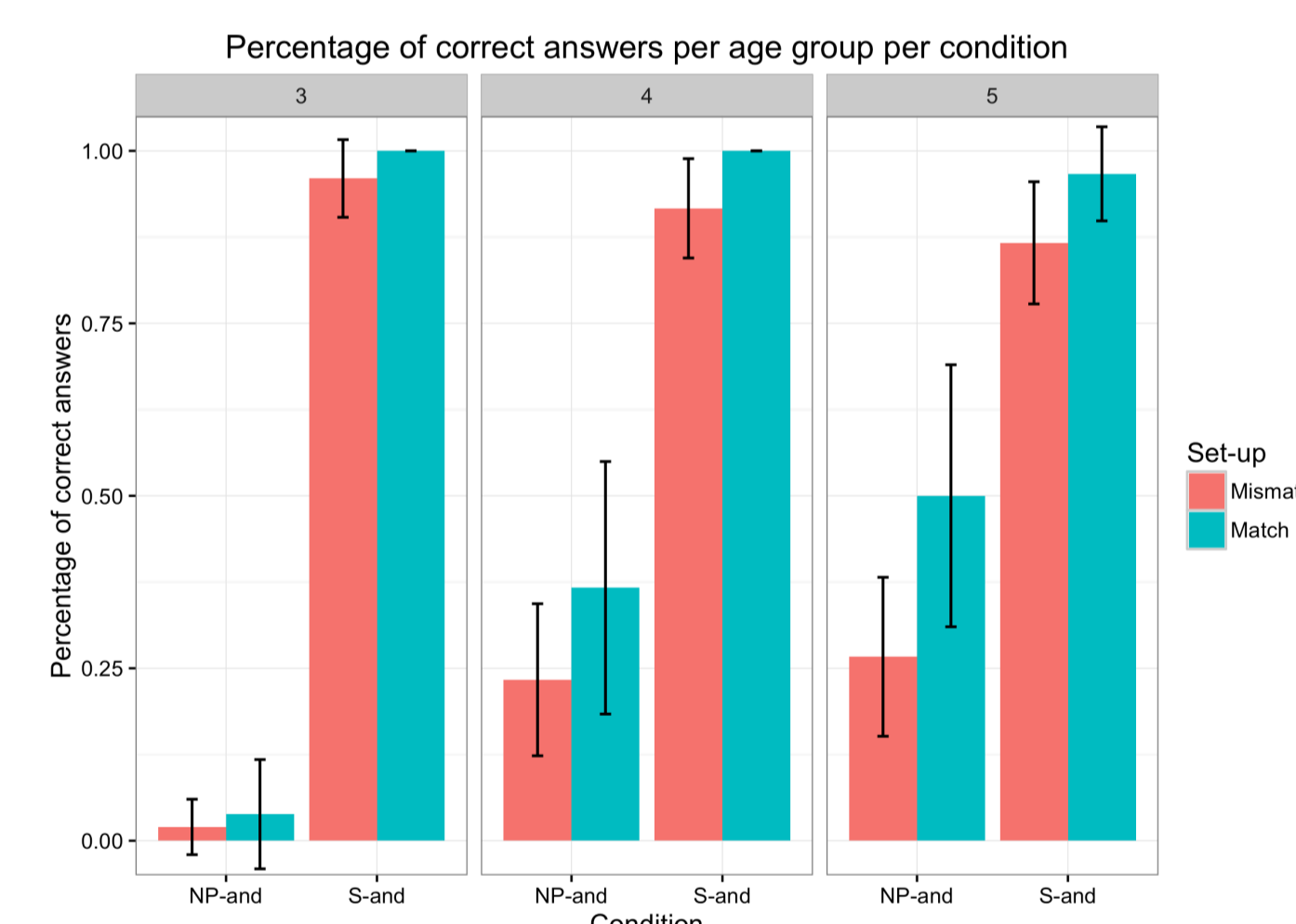


Fig 2: Exp 1 results with child participants (N=43)

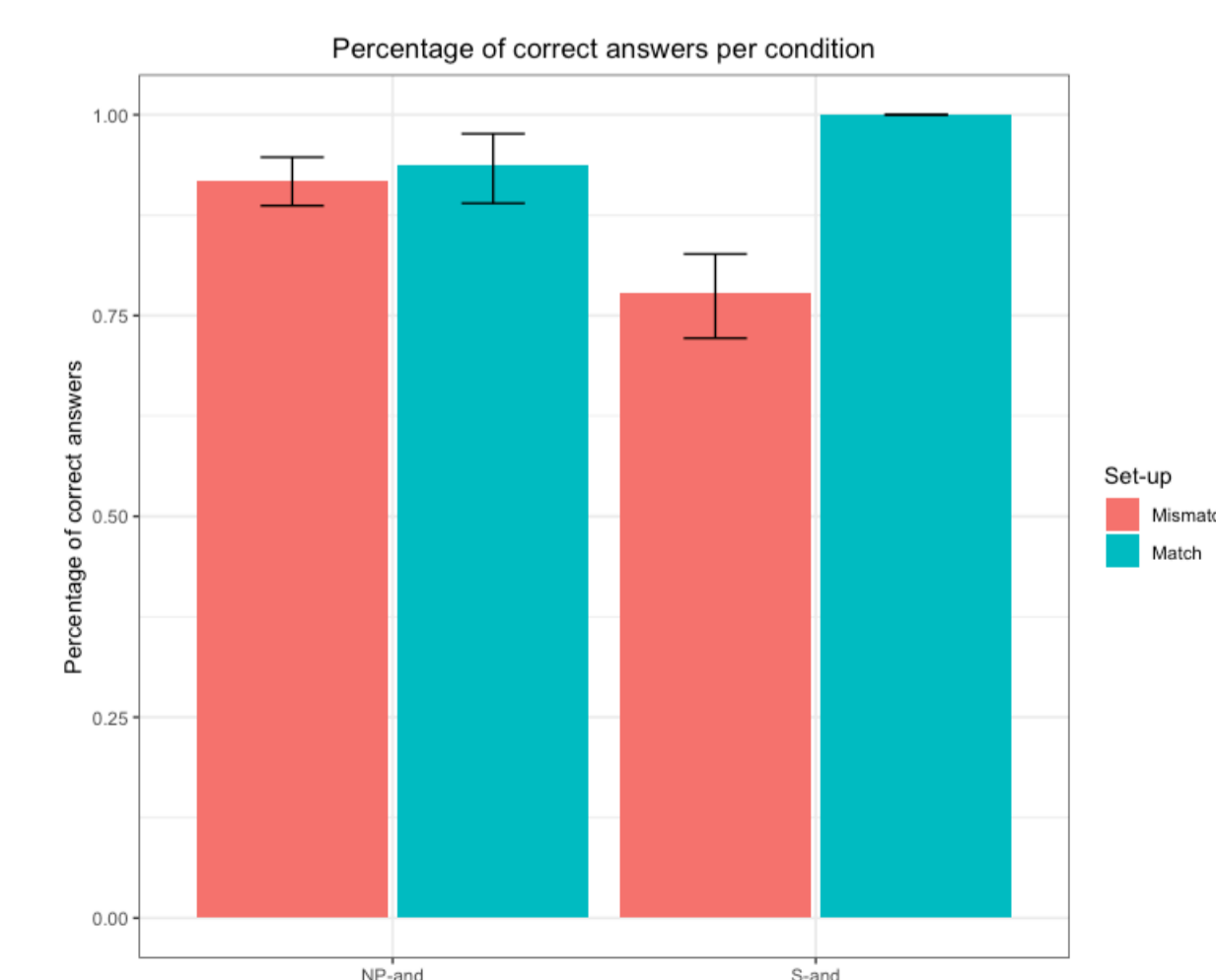


Fig 3: Exp 1 results with adult participants (N=68)

The Somebody Experiment 2.0

- Motivation: to try to side-step *Fairness!*
- **Stage:** 2 characters, 3 objects
- **ConjunctionType:** S-*and* vs. NP-*and*
- **Set-up:** Match vs. Mismatch
- Experimental procedure: same as Exp 1
- New materials increases the complexity of NP-*and* sentences, which will need to be taken into consideration when interpreting the results:
 - **S-*and*:** [Somebody has a carrot] **and** [somebody has a donut].
 - **NP-*and*:** Somebody has [a carrot **and** a donut], and somebody has milk.
- Results & Analysis using the exact same model specification as Exp 1:
 - Children: main effects of ConjunctionType ($b = 3.623, p < .01$) and Set-up ($b = 3.224, p < .01$), but no significant interaction between them ($b = 0.351, p = .753$).
 - Adults: a marginally significant interaction between ConjunctionType and Set-up ($z = 1.726, p = .084$).
- Possible interpretations:
 - Developmental asymmetry: S-*and* \gg NP-*and*?
 - Full competence of NP-*and*, but the accuracy is lower due to the complexity of the NP-*and* sentences & difficulty of fixing the scene?

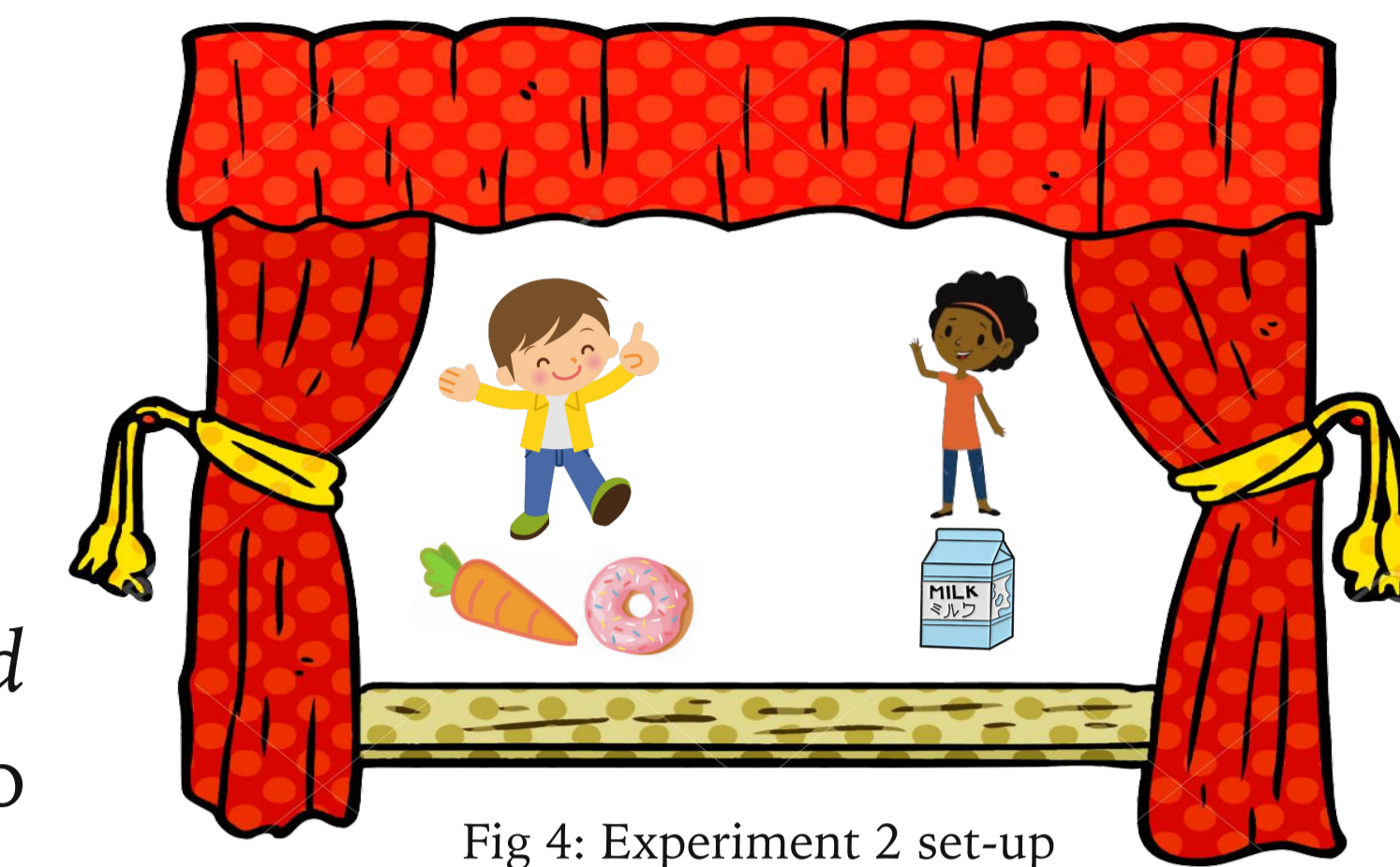


Fig 4: Experiment 2 set-up

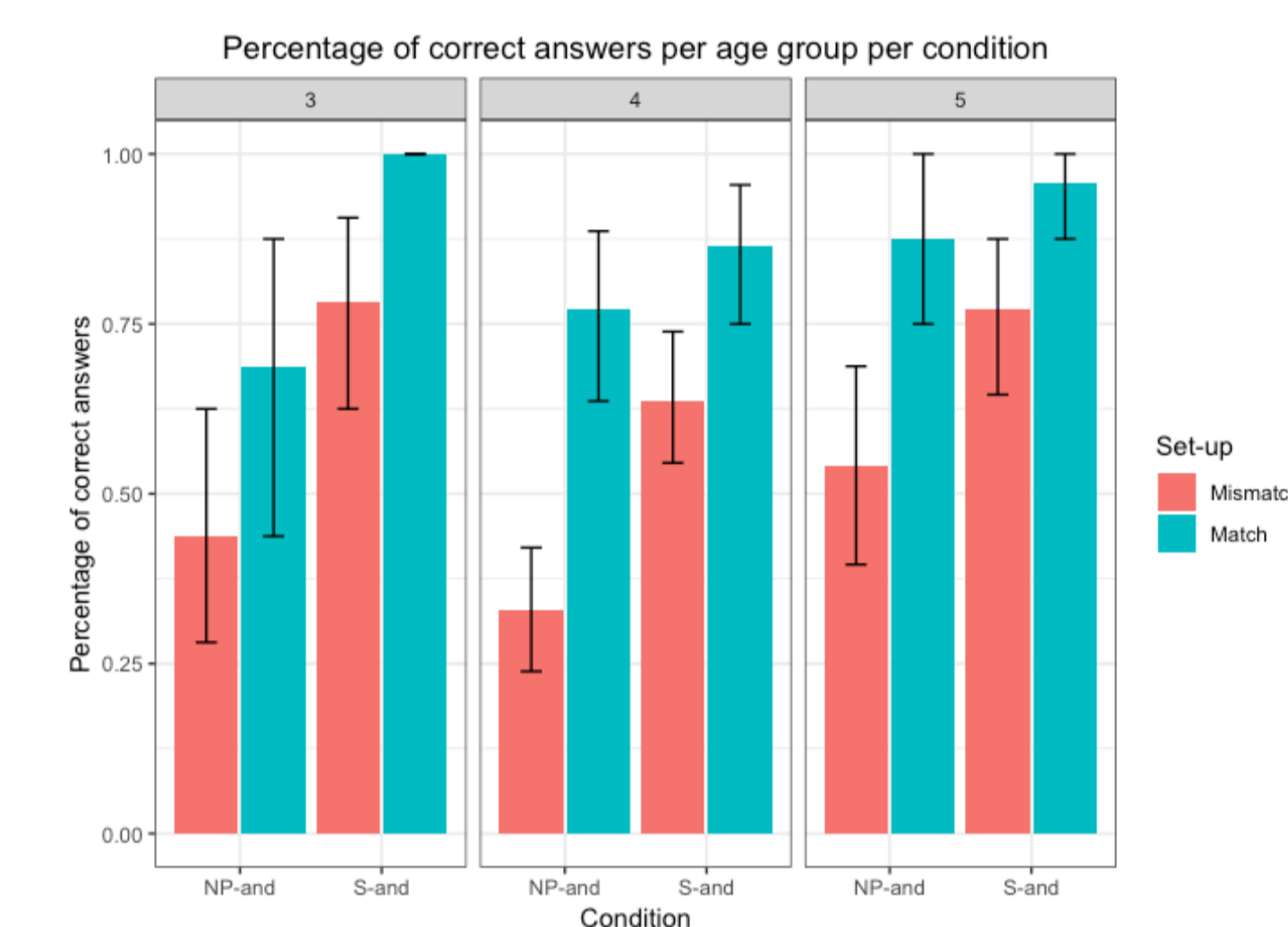


Fig 5: Exp 2 results with child participants (N=42)

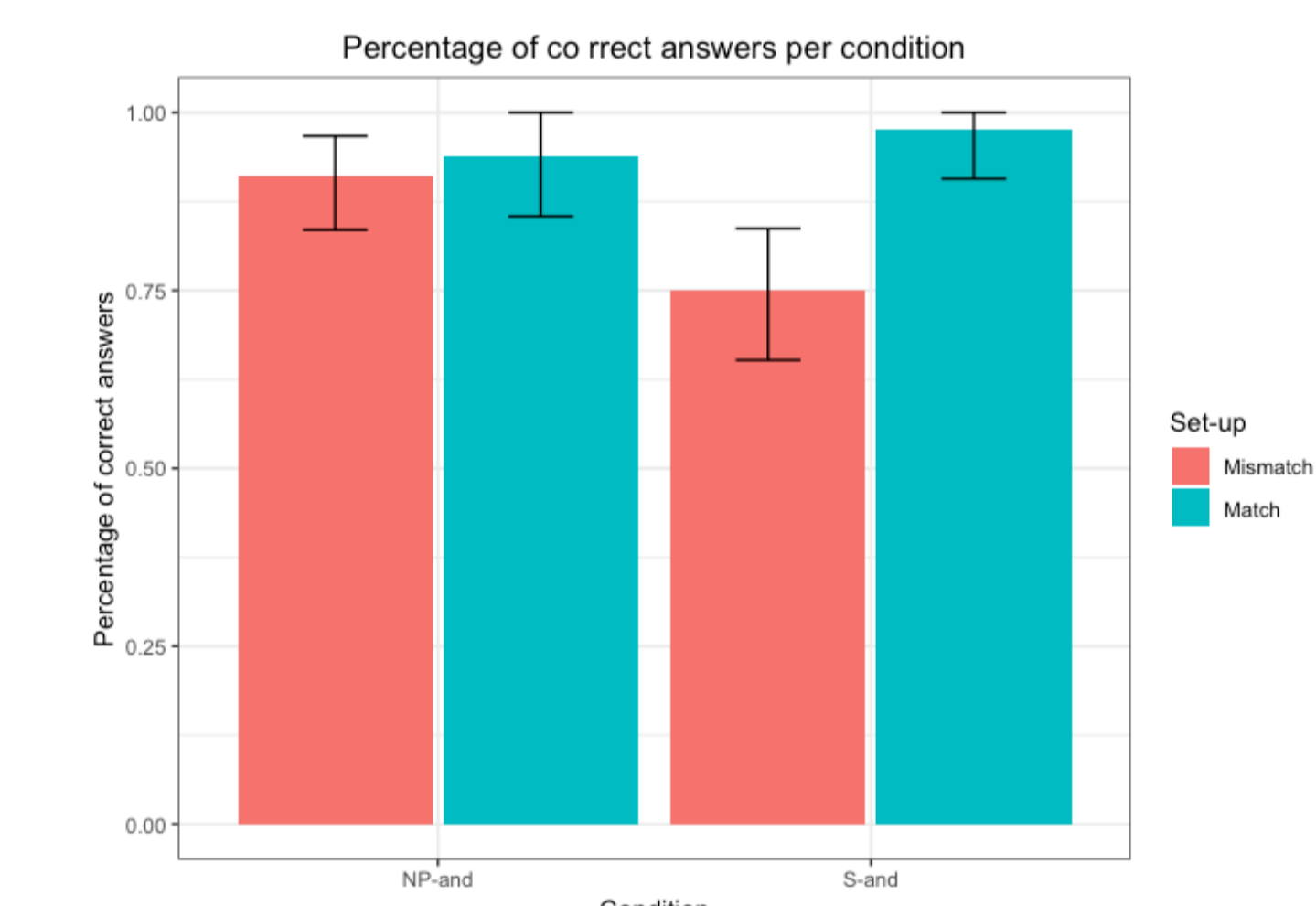


Fig 6: Exp 2 results with adult participants (N=28)

Summary & Outlook

- In Exp 1 & Exp 2, we observed that children exhibited full grammatical knowledge of S-*and*, but their performance on NP-*and* appeared to be lagging behind.
- Possibly, evidence in favor of a developmental asymmetry. However:
 - Exp 1: *Fairness!* may have led children to distribute objects as evenly as possible, yielding what looks like an S-*and* interpretation of NP-*and* sentences.
 - Exp 2: Side-stepping *Fairness!*, performance on NP-*and* improved considerably, but still lower than S-*and*, plausibly because NP-*and* condition is systematically more complex.
- Next step (on-going): a forced choice task, always with equal number of objects
 - Neutralizing the effect of *Fairness!*
 - Keeping the NP-*and* sentences comparably simple

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References

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LangAcq Lab

