

# Adjunct control interpretation in four year olds is colored by the task

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John bumped Mary after PRO tripping on the sidewalk

1. Children's performance was affected by the task
2. Remaining errors are due to parser, specifically similarity-based interference

# Adjunct control

John bumped Mary after PRO tripping on the sidewalk



# Adjunct control

**John** bumped Mary  $\left\{ \begin{array}{l} \text{after} \\ \text{before} \\ \text{while} \\ \text{without} \\ \dots \end{array} \right\}$  **PRO** tripping on the sidewalk

# Why adjunct control?

John bumped Mary after PRO tripping on the sidewalk

Kids have been reported to be non-adultlike in previous studies:

Available interpretation(s):

Adults: Subject control (John)

Kids: Subject control (John)

Object control (Mary)

Sentence internal (John or Mary)

Free reference (anyone)

# Reasons for non-adultlike behavior?

## 1. Non-adultlike grammar

Several different non-adultlike grammars proposed

- Variable Attachment
- Nominalization
- Agent Control

Many of the proposed non-adultlike grammars predict the same behavior

# Reasons for non-adultlike behavior?

## 2. Non-adultlike performance system

Children may have the adult grammar, but have trouble deploying it.

John bumped Mary after PRO tripping on the sidewalk

NP	NP	PRO
target	intervener	



# Reasons for non-adultlike behavior?

## 2. Non-adultlike performance system

Generalization:



Feature overlap → reading time differences in adults  
accuracy differences in children

# Reasons for non-adultlike behavior?

## 3. Task effects

- The task might encourage non-adultlike behavior independent of the grammar

# Reasons for non-adultlike behavior?

## 3. Task effects

- Processing demands associated with the task
  - Act-out task
  - Truth value judgment task (TVJT)

# New task: Coloring Book

Black and white picture, different interpretation depending on how the picture is colored in.



“Dora kicked the red ball!”

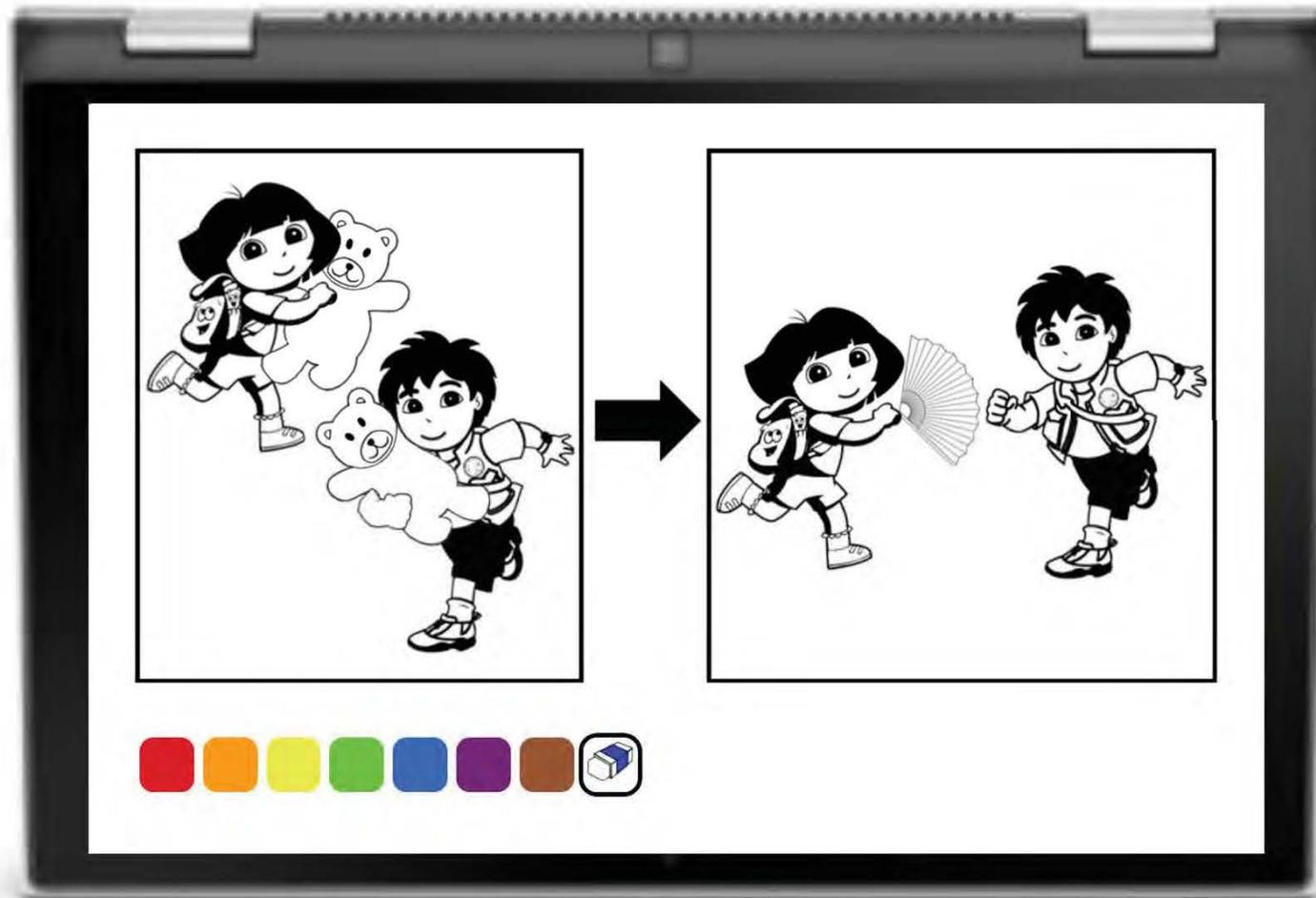
# New task: Coloring Book

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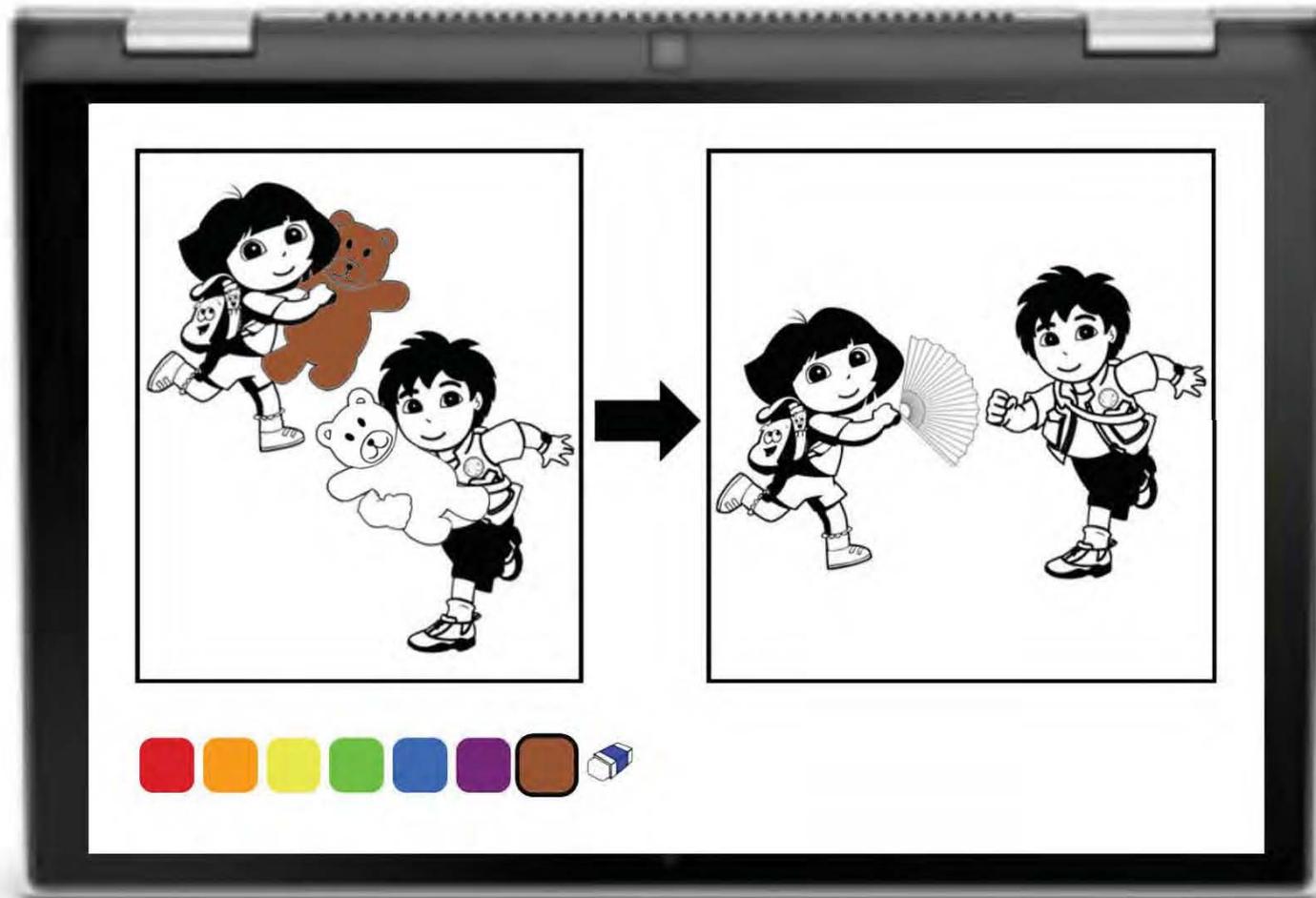
“Dora kicked the red ball!”

# Using Coloring Book with adjunct control



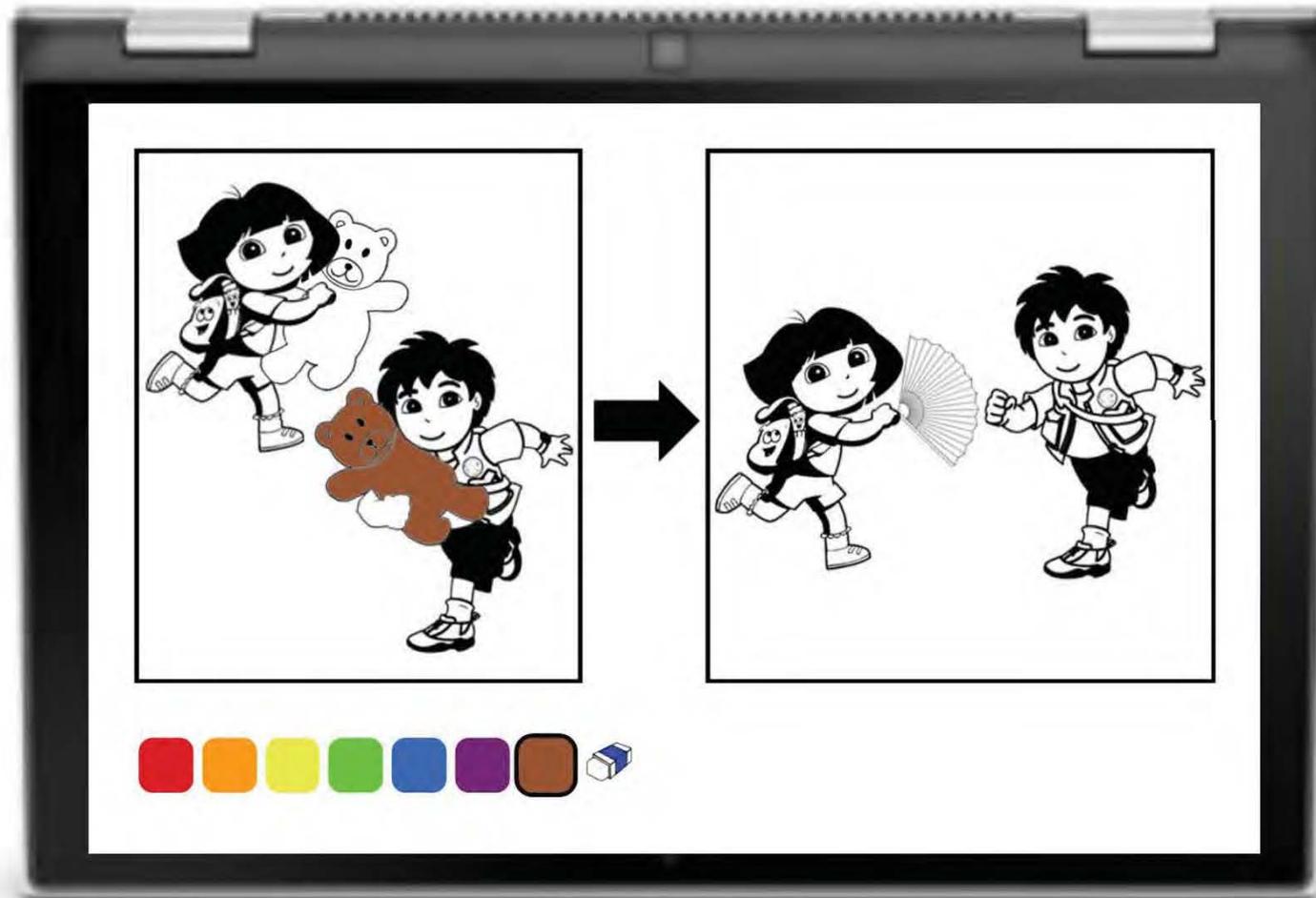
“Dora fanned Diego after hugging the brown bear”

# Using Coloring Book with adjunct control



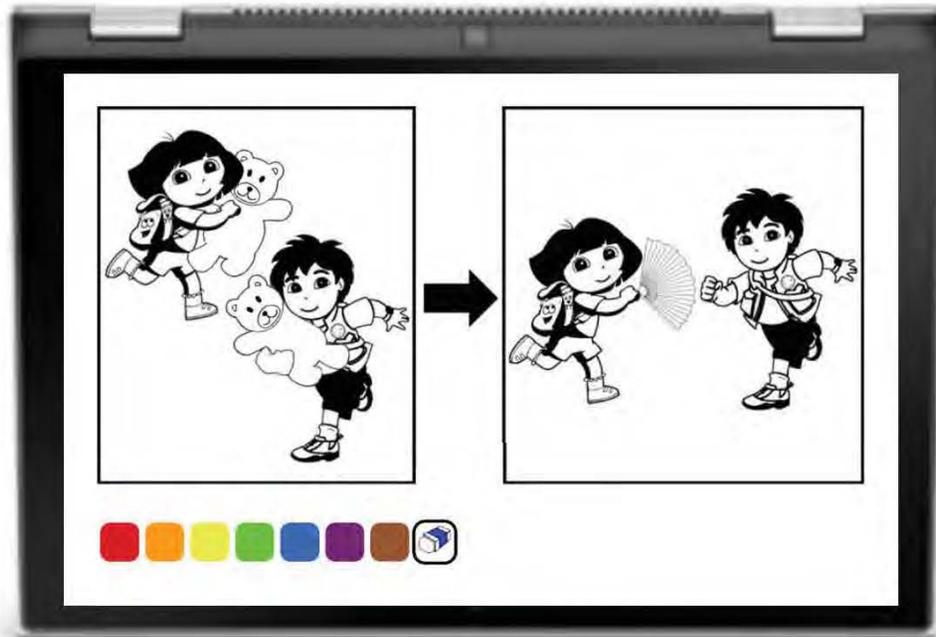
“**Dora** fanned Diego after hugging the brown bear”

# Using Coloring Book with adjunct control



“Dora fanned **Diego** after hugging the brown bear”

# Using Coloring Book with adjunct control



## Setup:

1. Bring up pictures
2. Describe each action
3. Preamble to balance the salience of each character
4. Test sentence

“In this picture, we have Dora fanning Diego, but first there’s Diego hugging a bear, and there’s Dora hugging a bear too!”

“So here’s how we should color this picture of Dora and Diego:”

“Dora fanned Diego after hugging the brown bear”

# Using Coloring Book with adjunct control

Test sentences: adjunct control

“Dora fanned Diego after hugging the brown bear”

Control sentences: finite adjunct + overt subject

“Dora fanned Diego after she hugged the brown bear”

“Dora fanned Diego after he hugged the brown bear”

Subjects

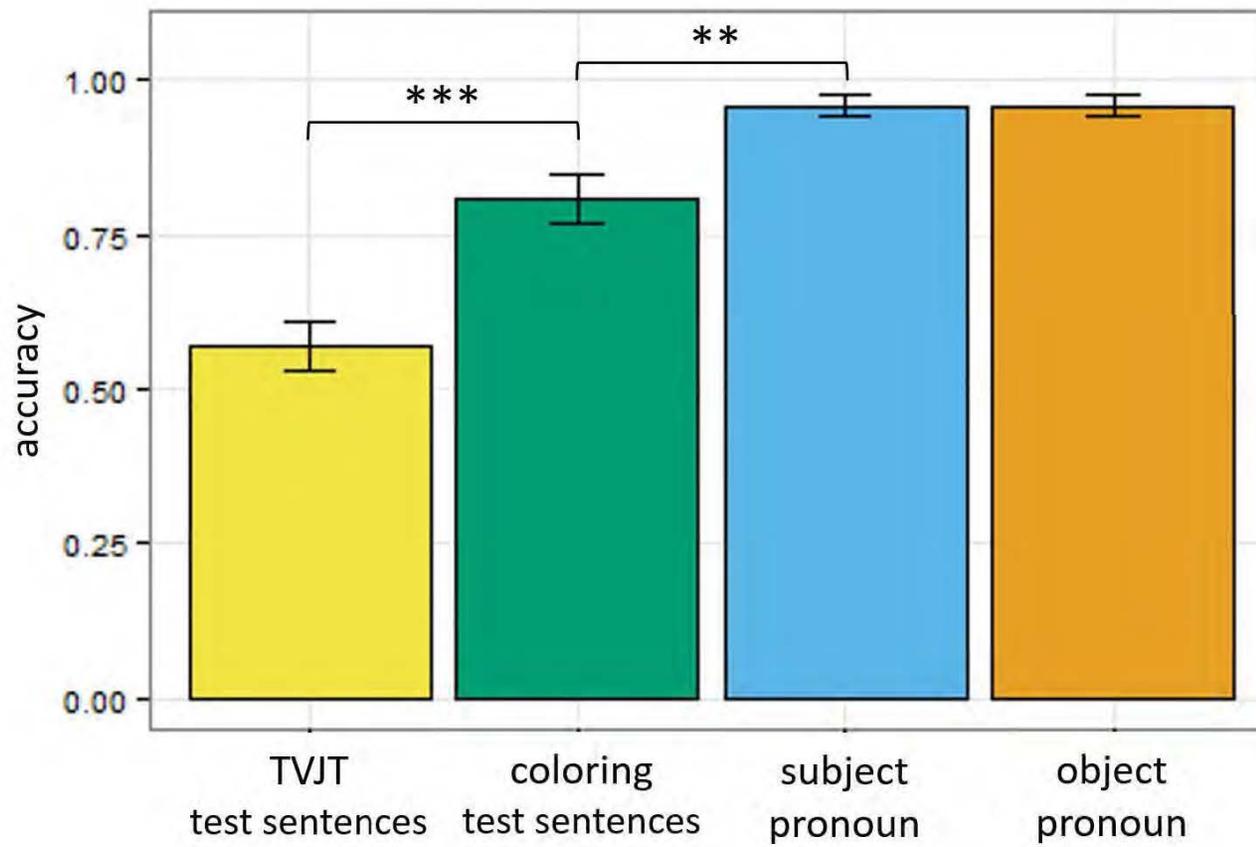
- n = 32
- 4;3-5;3, mean = 4;9
- 10-15 minutes for children
- Adults at 100% accuracy, took <5 minutes

# Results (n=32, 4;3-5;3, mean=4;9)

Test: **Dora fanned Diego after hugging the brown bear**

Controls: **Dora fanned Diego after she hugged the brown bear**

**Dora fanned Diego after he hugged the brown bear**



**Coloring task worked!**

# Why were kids more accurate?

<b>Coloring Book</b>	<b>Truth Value Judgment Task</b>
Parse test sentence	Parse test sentence
Retrieve antecedent	Retrieve antecedent
Color in correct item	Hold test sentence in memory
	Hold context in memory
	Compare test sentence to context
	Judge truth value of test sentence with respect to context

# Next steps

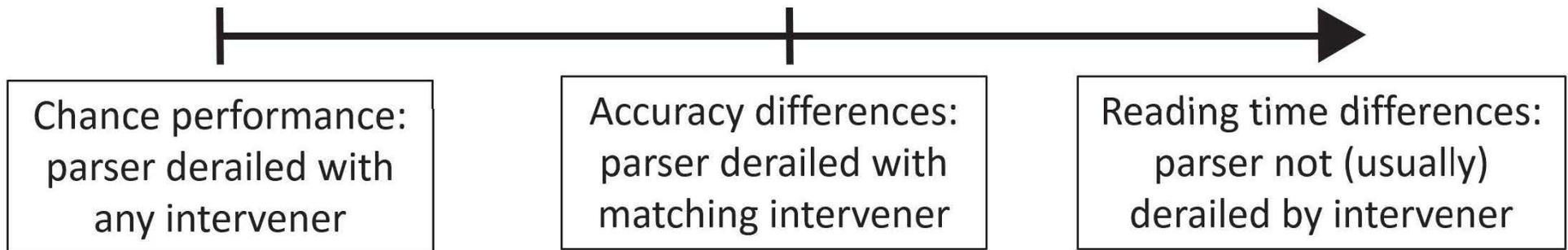
- Aside from the task, what else affects behavior?
  - Control sentences: overt subject, stronger cue for retrieval
  - Test sentences: error-prone retrieval mechanism?
- Preliminary results: interference effects for gender match/mismatch
  - Dora fanned Diego after hugging the brown bear: 75% correct*
  - Mickey fanned Diego after hugging the brown bear: 65% correct*

# Next steps

- What do younger kids know about adjunct control?
  - Knowledge seems to be in place by age 4; what about 3?
- Preliminary results with 3 year olds:
  - High accuracy for control sentences
  - Chance accuracy for adjunct control (test) sentences
  - Because of a change in knowledge, or in parsing abilities?

# Conclusion

- Development = parser becomes less susceptible to interference



# Thanks!

- Tara Mease
- Project on Children's Language Learning
- Families from the UMD Infant and Child Studies database, and Washington D.C. area preschools



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