

Roles of prototypes vs. situation-based inferences in the learning of absolute gradable adjectives

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Gradable Adjectives

- **Relative** Gradable Adjectives (big, light, fun...)
- **Absolute** Gradable Adjectives (full, spotted, straight, flat... Kennedy & McNally, 2005)
- Adults have very abstract concepts: “Full” = “containing the maximal amount without spilling over”

How do we come to understand the abstract meaning of “full”?



Syrett et al. (2010)

What do adults and children know about absolute gradable adjectives?

- 30 children (3-5 years old) and 24 adults
- They are asked to help a puppet “learn how to ask for things”
 - Their job was to determine if they could give the puppet what he asked for, and if they could not, tell him why not.
- “Please give me the X one”



Syrett et al. (2010)

What do adults and children know about absolute gradable adjectives?

Give me the sad one.

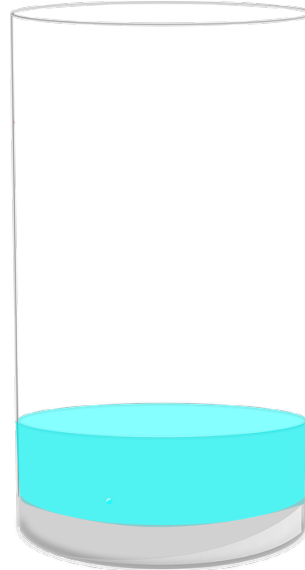
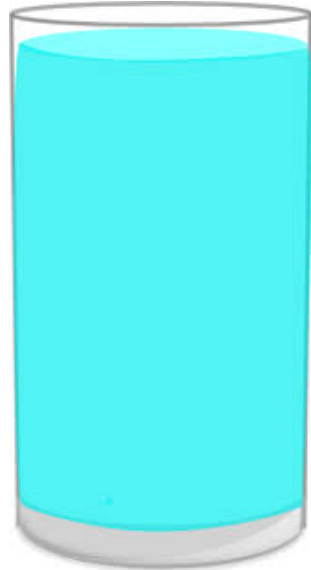


Neither

Syrett et al. (2010)

What do adults and children know about absolute gradable adjectives?

Give me the full one.

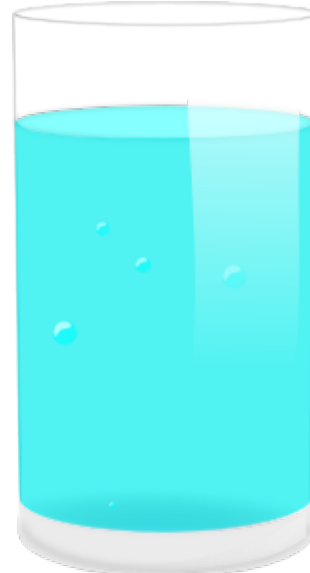


Neither

Syrett et al. (2010)

What do adults and children know about absolute gradable adjectives?

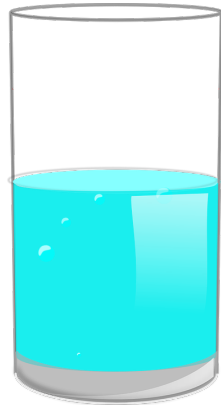
Give me the full one.



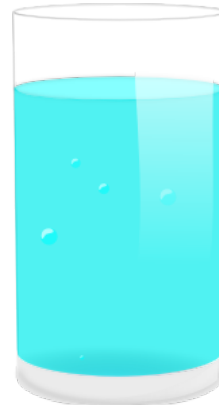
Neither

Syrett et al. (2010): "Full" Responses

3 Responses



Not as full



Fuller



Neither is full!

	3 year olds		4 year olds		5 year olds		Adults	
	Fuller	Neither	Fuller	Neither	Fuller	Neither	Fuller	Neither
Felicitous	100%	0	100%	0	100%	0	96%	4%
Infelicitous	60%	40%	70%	30%	70%	30%	12%	88%

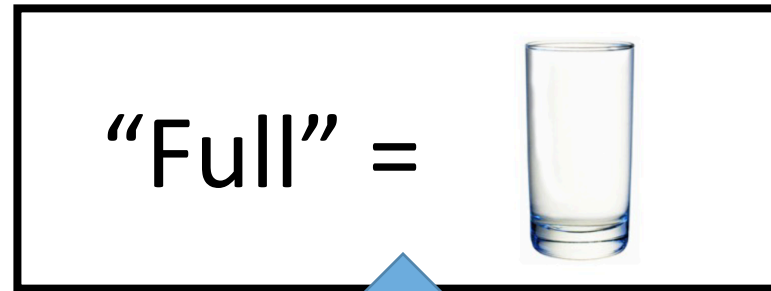
Three Possibilities

1. Representations are the same between kids and adults, but task demands cause differences in behavior
2. **Prototype-based learning:** Change in representation of “full” through development, based on prototypical exemplars
3. **Explanatory-based learning:** Changes in representation, based on contextual information

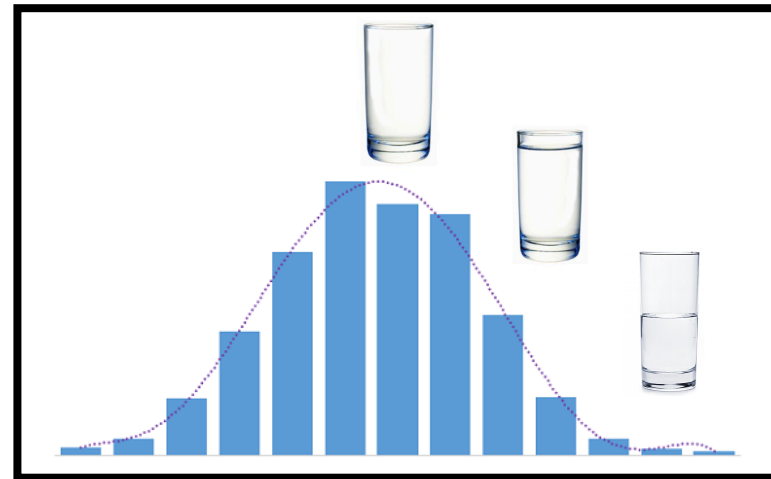


Possibility: Prototype-based Learning

**INTENDED
MEANING**



EXEMPLARS



Learners first hypothesize “full” = “sufficient amount of content”

Possibility: Explanatory-based Learning

**INTENDED
MEANING**

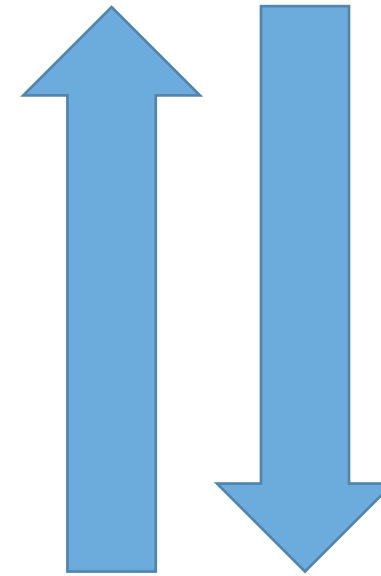
“Full” =



FACTORS

Speaker intention
Justified word usage
Visual context

EXEMPLARS



Learners attribute variability to context, taking into account speaker intention and environment

Question

If we teach adults a novel absolute gradable adjective, and manipulate whether they are exposed to contextual information, will they deduce different possible meanings?

Experiment 1

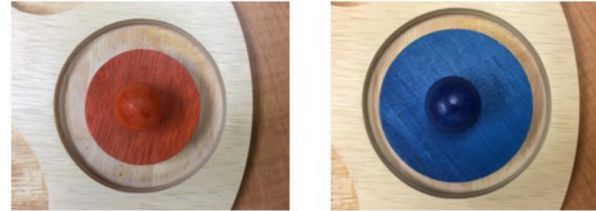
- Task: Teach adult English speakers (n=79, Turkers) a novel gradable adjective *pelty* = “tight-fitting”
- Training (24 items):
 - **With-Context:** Contextual justifications
 - **Without-Context:** Irrelevant information
- Test (4 trials):
 - Modeled after Syrett et al. (2010)
 - “Select the *pelty* one.”



Predictions

- If *pelty* was understood as an absolute gradable adjective, then we predict:

- 100% responses in 100/60 Trials
- **Neither responses in 90/70 Trials**



- Prototype-based learning: no effect of context in responses
- **Explanatory-based learning: effect of context (reflected in Neither responses)**

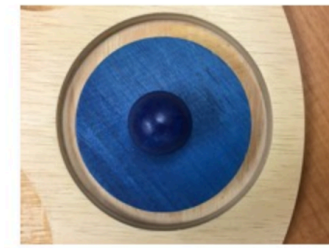


100%

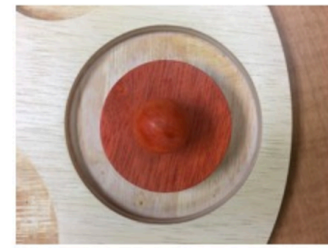


60%

Results

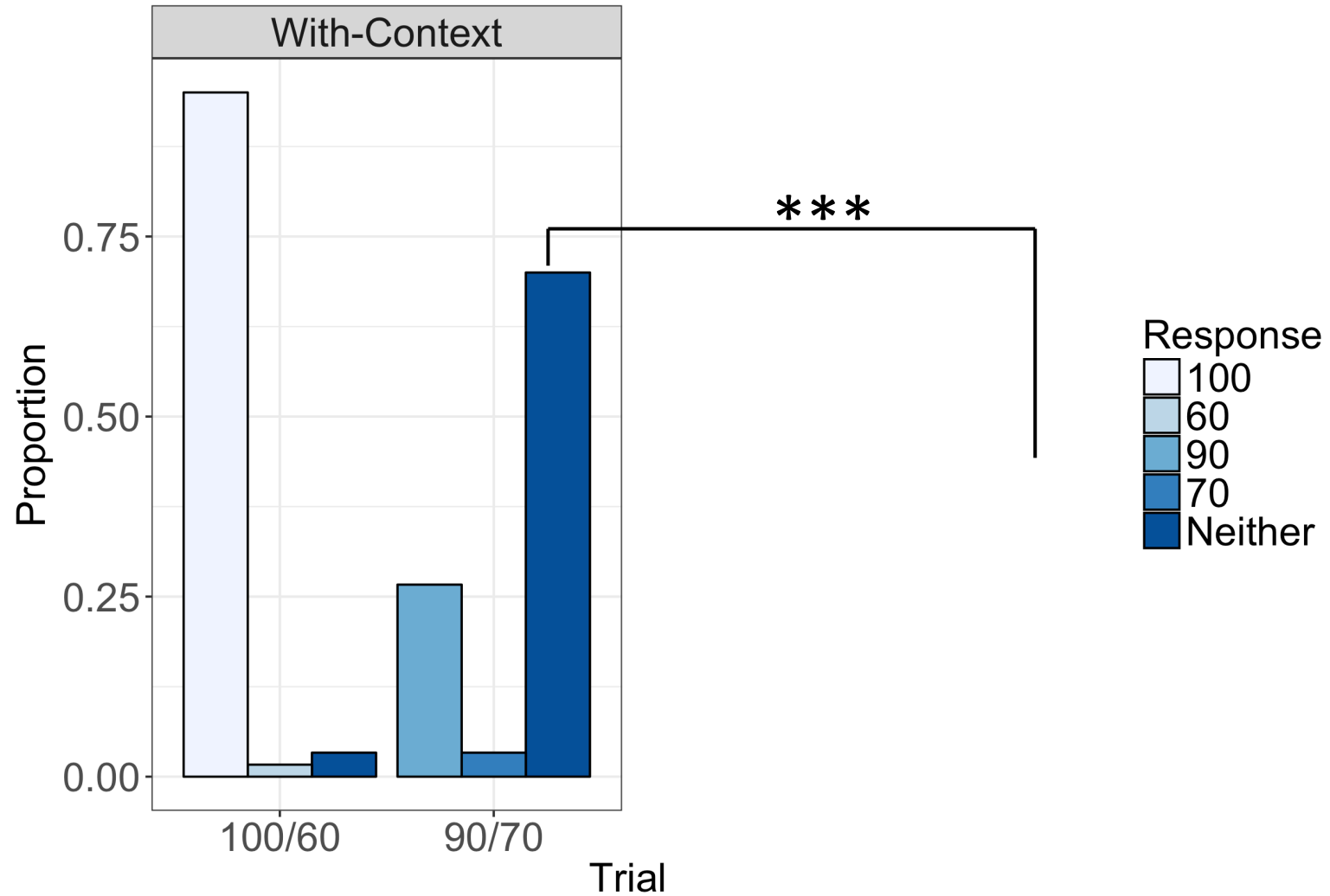


90%



70%

Experiment 1 Context Manipulation



Results

- Listeners were able to deduce a meaning with a maximal standard when given contextual information
- Explaining away variance in exemplars: attributing to speaker intention
- Allows for deduction of a meaning that can be generalized to broader range of exemplars
- Evidence for **Explanatory-based learning**

Experiment 2

- Replication of Experiment 1, with **fewer prototypical exemplars**
- Participants: 63 Turkers
- Training (similar to Experiment 1):

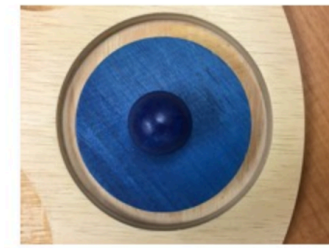
	Visually unambiguous		Visually ambiguous		Total
	Labeled as <i>pelty</i>	Labeled as <i>not pelty</i>	Labeled as <i>pelty</i>	Labeled as <i>not pelty</i>	
Experiment 1	6	6	6	6	24
Experiment 2	3	3	9	9	24



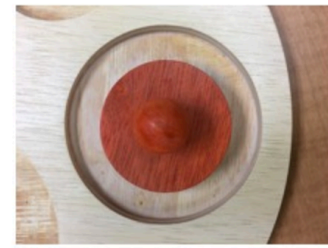
100%



60%



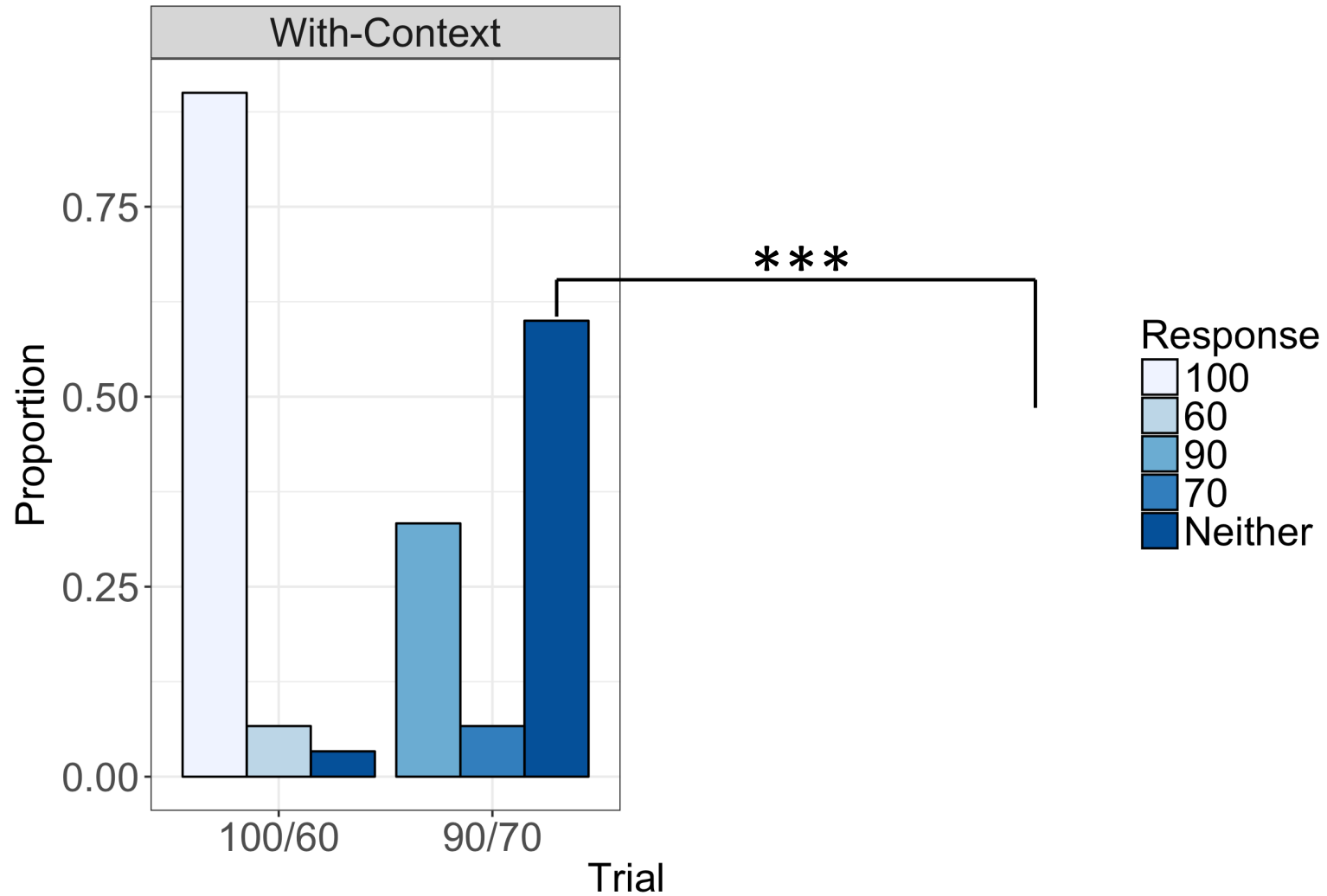
90%

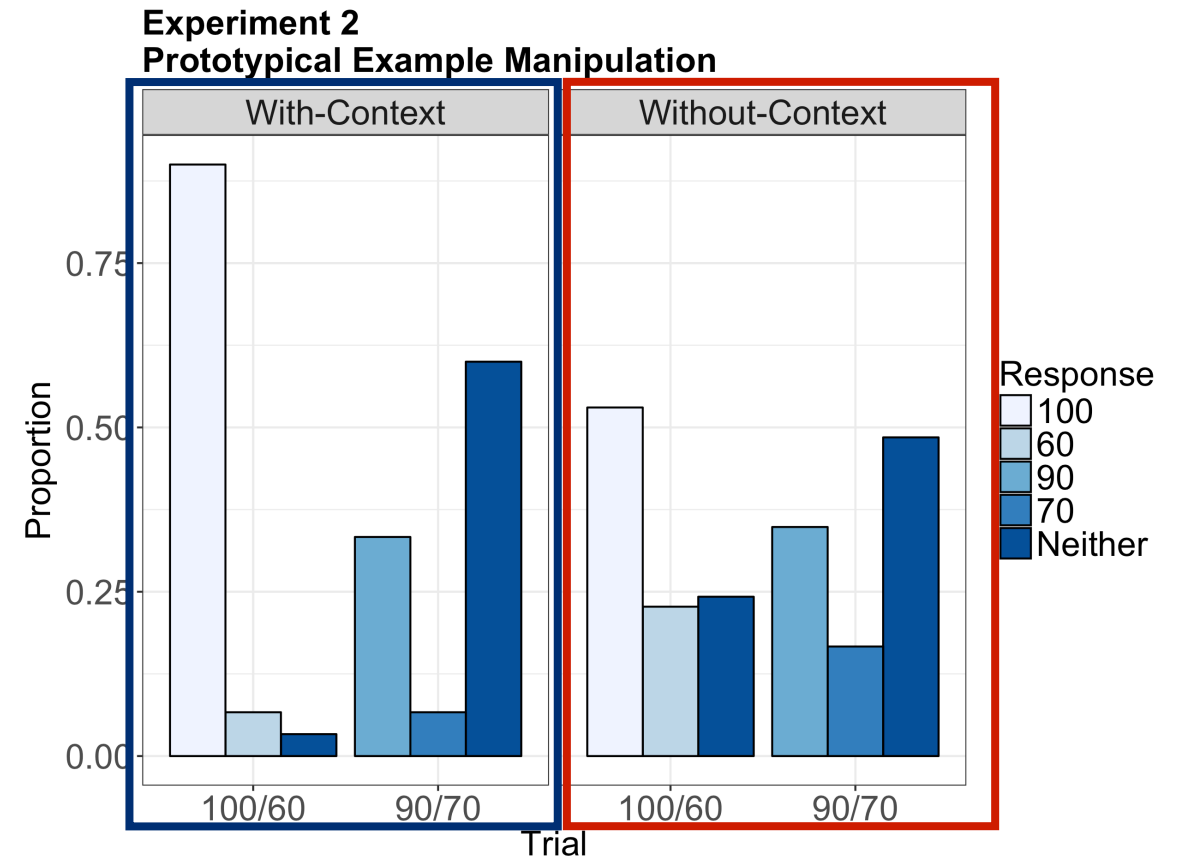
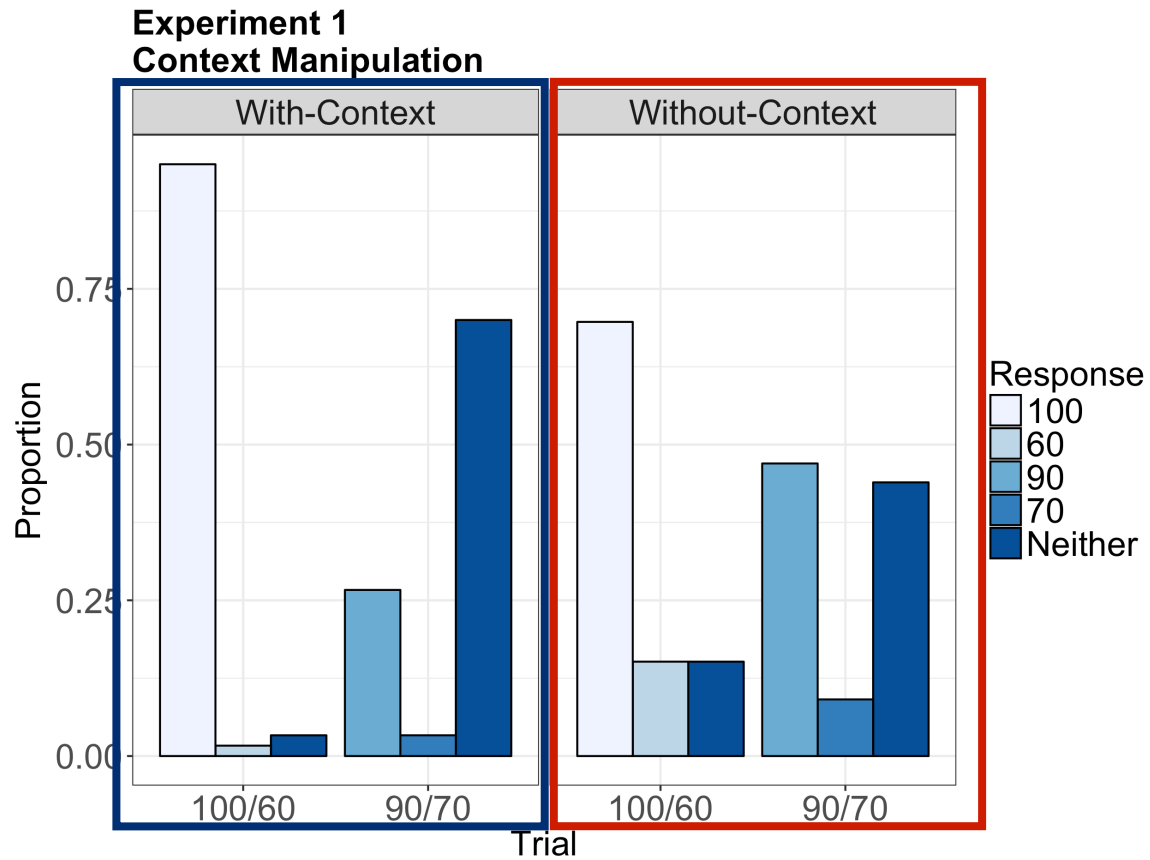


70%

Results

Experiment 2 Prototypical Example Manipulation





Results

- Replication of Experiment 1
- With contextual information, learning still occurs even with less prototypical exemplars
- Without contextual information, learners are statistically mapping visual exemplars to the word
- Evidence for Explanatory-based learning

Conclusions

- Word-learning is not simply detecting frequencies between words and observed exemplars
- While frequency plays a role, contextual information assists in deducing the meaning of abstract words in variable environment





Thank you!

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Experimental, Semantics, and Pragmatics group at UR



CHILDES: Use of “full”

- Providence (1-4yo)
 - Not commonly heard : average .04% of all tokens
 - “That is one full belly”
 - “Mommy is full of yawns”
 - “He found to his surprise that the bath was so full of water, it was starting to run over the side”
- Gleason (4-5yo)
 - Average .0004% of all tokens
 - “Don’t talk with your mouth full”

