Acquiring Word Knowledge from Low Informative Input

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Introduction

- Children learn words in a notoriously challenging learning environment.[1]

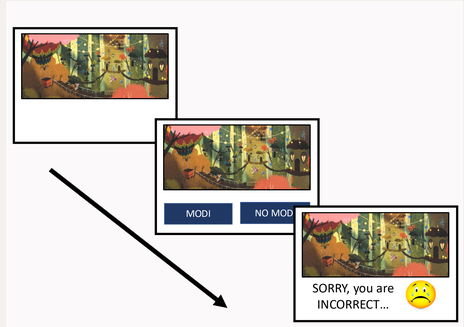
- Studies of children's everyday learning environments have found that most naming events children experience are "low informative (LI)".[2,3]
- Whether these LI events contribute to learning are a matter of great debate.
  - ❖ LI events do not contribute to learning.[4]
  - ❖ LI events do contribute to learning via cross-situational processes.[5]

Current Study:

- The current study explores the possibility of a middle-ground in this debate: although LI events may not lead to full acquisition of word meaning, they nevertheless lead to valuable partial knowledge of that meaning.
- By developing a paradigm that incorporates multiple assessments of learning, the current study allows us to probe the nature of partial learning and partial word representations acquired via LI events.
- Experiment 1: Do learners acquire partial word knowledge from real-world LI events?
- Experiment 2: What is the nature of that partial word knowledge?

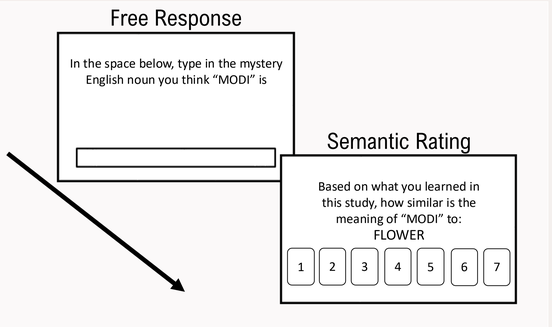
Experimental Paradigm

Learning Phase: Categorization Task



- Participants had to categorize 32 scenes that did and did not contain the mystery word (16 targets; 16 distractors).

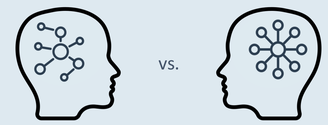
Testing Phase



- Free Response (FR): Participants guessed the mystery word.
- Semantic Rating: Participants rated how similar the mystery word was to 8 English words, including the target word.

Experiment 2 Methods

- Identical to Exp 1 except that the semantic rating task was expanded to a 30-word battery and included:
  - ➢Target word (e.g., "Apple")
  - ➢Target Competitors (e.g., "Tree", "Pear")
  - ➢Non-Target Competitors (e.g., "Toy", "Scarf")
- A separate group of participants rated the similarity between each of the words in the 30-word battery to assess:



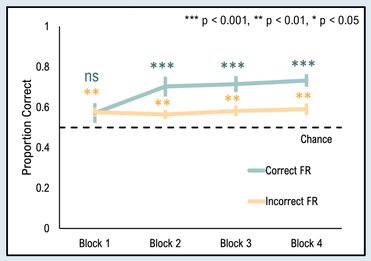
Partial Knowledge of a word from LI events

Real-World Knowledge of that word

EXPERIMENT 1 Data

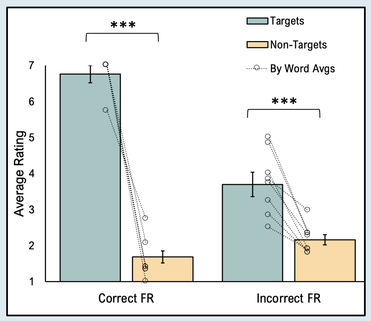
Categorization Performance By Free Response

- Participants who correctly identified the mystery word's meaning performed better in the categorization task than those who did not.
- Importantly, even those who were *incorrect* in their FR guesses were nonetheless above chance in the categorization task.



Semantic Rating Test By Free Response

- Participants who correctly identified the mystery word's meaning rated the target word higher than those who did not.
- Surprisingly, participants rated the target word significantly higher than the non-targets even when they *failed* to learn the precise meaning of the mystery word.



EXPERIMENT 2 Data

Semantic Rating Test (Incorrect FR only)

We assessed the **correlation** between the semantic representation of partial knowledge acquired from a word's LI events and:

Real-World Knowledge of the Target:

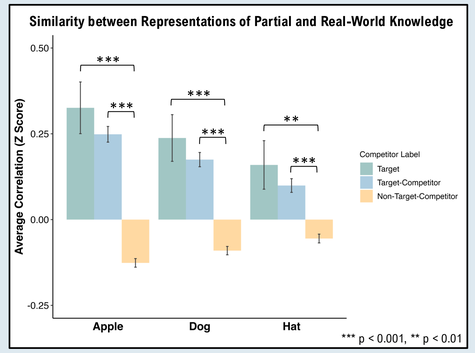
How similar is the meaning of "**MODI**" to: [30-word battery] ⟷ How similar is the meaning of "**Apple**" to: [30-word battery]

Real-World Knowledge of Target-Competitors:

How similar is the meaning of "**MODI**" to: [30-word battery] ⟷ How similar is the meaning of "**Tree**" to: [30-word battery]; How similar is the meaning of "**Pear**" to: [30-word battery]; …

Real-World Knowledge of Non-Target-Competitors:

How similar is the meaning of "**MODI**" to: [30-word battery] ⟷ How similar is the meaning of "**Toy**" to: [30-word battery]; How similar is the meaning of "**Scarf**" to: [30-word battery]; …



- Semantic representations derived from LI events of a word were more correlated with real-world representations of that word than representations of unrelated words.
- However, these representations were not more correlated with real-world representations of that word than representations of related words.

Discussion

- The type of events that contribute to word learning may depend on how word learning is assessed. [6]
- Based on a free response test, low informative events fail to produce exact word meaning acquisition; based on other tests, low informative events appear to yield valuable partial knowledge of word's meaning.
- Further semantic analyses suggest that low informative events get learners into the right broad semantic neighborhood but fall short in allowing learners to distinguish between closely-related meanings.

Future Directions

- Do low informative events privilege the acquisition of some types of semantic information over others (e.g., taxonomic vs. thematic)?
- How do the semantic networks that emerge purely from low informative events differ from those that emerge from a mixture of low and high informative events?

REFERENCES & ACKNOWLEDGEMENTS

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