Characterizing Novel Concept Learning in Poor Comprehenders

S. KHAN*[1,2], V. PATEL*[4, 5], M. VHORA*[3, 4], K. RYHERD[1], N.LANDI[1,2,5,6,7]
(*indicates co-authors)

[1]Dept. Speech-Language-Hearing Sciences, [2]Dept. Psychology, [3]Dept.Physiology & Neurobiology, [4]Dept. Molecular & Cell Biology, [5]UConn Language & Plasticity IGERT; [6]Haskins Laboratories; [7]Yale University, Child Study Center

Introduction

Poor comprehenders (PCs) have difficulties with comprehension despite age-appropriate cognitive skills and phonological processing.

Several researchers have proposed that Lexical-semantic weaknesses may be contributing to PCs' comprehension deficit[4,5].

In this experiment, we investigate PCs' ability to construct novel semantic representations (categories), both nonverbally and verbally.

Questions:
1) Do PCs notice similarities to create categories?
2) Do PCs differ in their ability to link verbal labels to existing semantic representations?
3) Does directing attention to category-relevant features support category learning and label-mapping in PCs?
- Previous research shows that comprehension increases in PCs after being directed to relevant information[3].

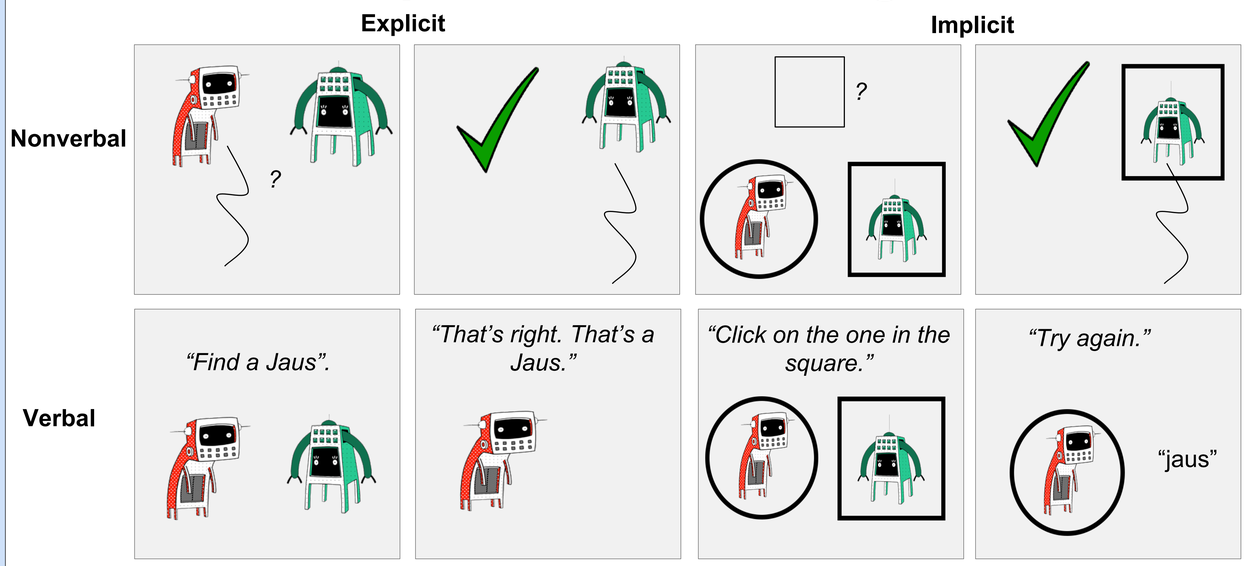
Methods

Participants: UConn participant pool students with a range of reading comprehension abilities. (n=29)

Behavioral Assessments: TOWRE, Woodcock-Johnson Word Attack, Nelson-Denny Comprehension and Vocabulary, and Raven's Advanced Matrices

Category Training Experiment: Eye movement data was collected using an Eyelink 1000 Plus desktop mounted eye tracker. E-Prime 2.0 was used to present the experiment and collect accuracy/reaction time.

Experimental Paradigm



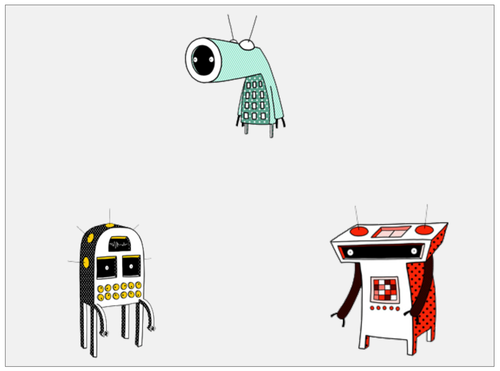
Categories were made up of 3 robots, each with the same movement pattern (ex. jumping, gliding, spinning, etc.). First, movements were associated to robots nonverbally (*representation construction*). After movement-robot mapping, the names of the robot categories were learned (*verbal mapping*).

Training: In both training conditions two robots appeared on the screen and feedback was given after each trial. Participants were tested on explicit and implicit learning in a random order.

Explicit Condition: participants respond based on category-relevant features (movement pattern or label)
Implicit condition: participants respond based on a category-irrelevant visual feature

Testing: Three robots appeared on the screen (two from one category and one from another). The participant had to indicate which two robots were related.

"Please click on whichever robot on the bottom is from the same family as the robot on top."



Expected Results

1) Do PCs notice similarities to create categories?
- If PCs have trouble creating categories, we would expect them to show **poorer** performance than TDs during the **nonverbal** task.

2) Do PCs differ in their ability to link verbal labels to existing semantic representations?
- If PCs have trouble linking verbal labels to existing semantic representations, we would expect them to show **poorer** performance than TDs during the **verbal** task.

3) Does directing attention to category-relevant features support category learning and label-mapping in PCs?
- If directing attention benefits PCs, we would expect them to **perform better** in the **explicit** tasks than in the implicit tasks.

Contact: Kayleigh Ryherd
kayleigh.ryherd@uconn.edu

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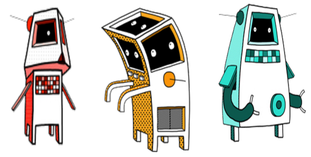
Thanks for your attention!



Citations:(1) Landi, N. (2009). An examination of the relationship between reading comprehension, higher-level and lower-level reading sub-skills in adults. *Springer Science Business Media,* 701-717. (2) Cain, K., Bryant, P., & Oakhill, J. (2004). Children's Reading Comprehension Ability: Concurrent Prediction by Working Memory, Verbal Ability, and Component Skills. *Journal of Educational Psychology, 96*(1), 31-42. (3) Nation, K., & Snowling, M. J. (1998). Semantic Processing and the Development of Word-Recognition Skills: Evidence from Children with Reading Comprehension Difficulties. *JOURNAL OF MEMORY AND LANGUAGE,* 85-101. (4) Ouellette, G. P. (2006). What's Meaning Got to Do With It: The Role of Vocabulary in Word Reading and Reading Comprehension. *Journal of Educational Psychology, 98*(3), 554-556. (5) Nation, K., & Snowling, M. J. (1999). Developmental differences in sensitivity to semantic relations among good and poor comprehenders: Evidence from semantic priming. *Elsevier,* B1-B13.