Separating presentation of words and their referents facilitates learning for children with and without Developmental Language Disorder

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Introduction

- Children with Developmental Language Disorder (DLD) struggle to learn new words, averaging 0.6 *SD*s below their peers with typical language development (TLD)[1]
- Encoding new word forms is a particular challenge[2]
- Direct instruction (via ostensive naming) improves word form encoding for children with TLD, but *not* DLD[3]
- **We hypothesized that separating exposure to novel words and their referents would enhance encoding of word forms & referents, but hinder the linking words to referents both for children with DLD and TLD**

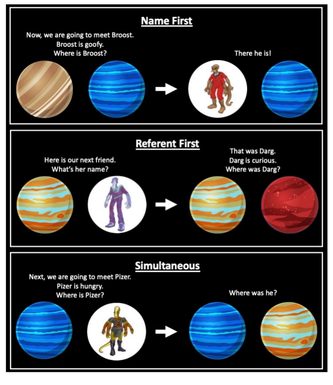
Method

Participants

- 14 children with DLD & 39 children with TLD, between 9;5 and 11;1 years of age (4th grade)
- Children with DLD scored below 15th percentile on sentence recall[4] and below a standard score of 92 on the Test of Narrative Language[5] (92% sensitivity & specificity)
- All children primarily English-speaking, normal hearing, nonverbal IQ > 70, no ASD or neurological disorders (except ADHD)
- Data collection part of an ongoing longitudinal study[6]

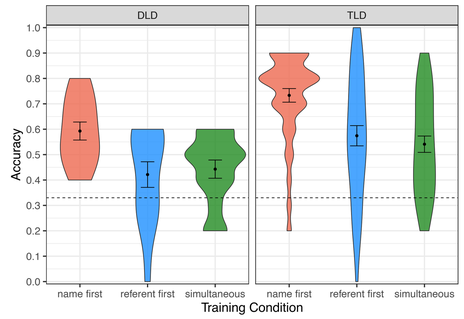
Training

- Taught the names of 30 aliens[7] in three conditions
- 1 trial per alien, labeled 3x
- Timing of exposure to the novel word (name) and referent (alien) either sequential or simultaneous:
  - **name first (n=10):** hear name, then see alien
  - **referent first (n=10):** see alien, then hear name
  - **simultaneous (n=10):** see alien & hear name



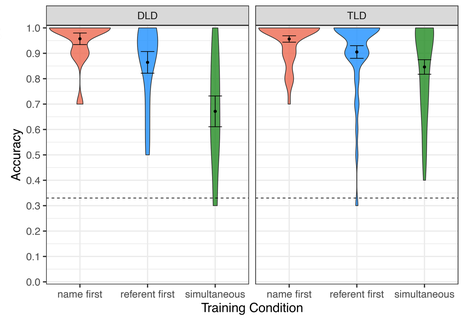
Separating exposure enhances encoding of word forms

- When discriminating trained name from 2 phonological neighbors
- Children were more accurate when exposure during training was name then referent
  - name first > referent first = simultaneous
  - for children with DLD, *F's* > 6.3, *p's* < .05
  - and children with TLD, *F's* > 20.0, *p's* < .001
- All accuracies above chance
  - for children with DLD, *F's* > 3.0, *p's* < .09
  - and children with TLD, *F's* > 45.1, *p's* < .001



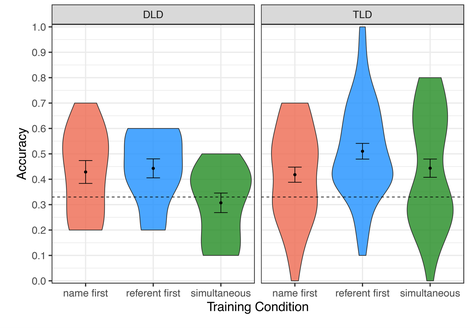
Separating exposure enhances encoding of referents

- When discriminating trained alien from 2 untrained aliens
- Children were most accurate when exposure during training was name then referent
  - name first > referent first > simultaneous
  - for children with DLD, *F's* > 4.5, *p's* < .05
  - and children with TLD, *F's* > 3.8, *p's* < .06
- All accuracies above chance
  - for children with DLD, *F's* > 72.0, *p's* < .001
  - and children with TLD, *F's* > 458.5, *p's* < .001



Separating exposure enhances encoding word-referent mappings

- When selecting the named alien from 3 trained aliens
- Children were more accurate when exposure during training was sequential
  - name first = referent first > simultaneous
  - for children with DLD, *F's* > 3.4, *p's* < .07
  - referent first > name first = simultaneous
  - for children with TLD, *F's* > 2.9, *p's* < .10
- All accuracies above chance
  - **except for simultaneous** for children with DLD, *F's* > 3.7, *p's* < .06
  - for children with TLD, *F's* > 9.3, *p's* <.01



Conclusions

- Separating exposure enhances encoding of both novel word forms (phonological information) and novel referents (visual information)
  - Perhaps by decreasing processing demands[8]
- Separating exposure also enhances encoding of word-to-referent mappings
  - Contrary to our predictions that it would hinder mappings
- For children with DLD, sequential exposure to first the word and then the referent was best
  - Still lagged behind peers with TLD in encoding novel word forms
- These results have clinical implications for vocabulary instruction: at the *earliest stages*, learning can be improved by scaffolding the environment to separate encoding of phonological and visual information
- Future research will explore whether combinations of separate then simultaneous exposures best facilitate learning

Disclosure

- Authors Ron Pomper, Timothy Arbisi-Kelm, Nichole Eden, and Karla McGregor have no conflicts of interest
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