How children with and without Developmental Language Disorder infer word meanings from written and spoken texts

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Introduction

• Children with Developmental Language Disorder (DLD) tend to have difficulties with reading comprehension[1] and are less accurate at inferring word meaning during shared book reading[2]

• **We hypothesized that: children with DLD would be less accurate than their peers with typical language development (TLD) at inferring word meanings from text, these difficulties would be greater for written than spoken text, and would be related to individual differences in reading and cognition.**

Method

Participants

• 20 children with DLD & 39 children with TLD, between 9;5 and 11;1 years of age (4th grade)

• 3 additional children with DLD were unable to complete the reading portion of the task

• Children with DLD had a standard score below 92 on the Test of Narrative Language[3] (92% sensitivity & specificity)

	DLD (n=20)	TLD (n=39)	p.value
Age (months)	121.9 (5.0)	123 (4.3)	0.361
Parent Ed (years)	14.2 (2.3)	17.1 (2.3)	<.001
School Month	7.5 (3.0)	8.3 (2.8)	0.317
TOSREC	79.1 (14.2)	105.3 (15.1)	<.001
NWR	76.2 (10.3)	86.4 (5.5)	<.001
WASI	95 (10.0)	112.9 (12.4)	<.001
TNL	84.2 (5.4)	111.6 (9.3)	<.001
TrackIt	0.71 (0.29)	0.84 (0.23)	0.082

• Primarily English-speaking, normal hearing, nonverbal IQ > 70, no ASD or neurological disorders (except ADHD, epilepsy)

• Data collection part of an ongoing longitudinal study[4]

Test of Inference

• Read 5 of the paragraphs & listened to an examiner read 5 paragraphs from grade 4 readers

• For each paragraph, one noun, one verb, and one adjective were placed with blanks (30 total; 15 per condition)

• Children read or listened to sentences with blanks again and were asked to fill in the blank with a word

• Answer scored correct if it matched any of the answers provided by 20 adults who completed written version

• Incorrect answers were categorized by type: semantic, syntactic, repetition, "I don't know", use of phrase, incorrect word form

Children with DLD struggle to infer word meanings when reading & listening

• Children with TLD (M = 67.7%) more accurate than children with DLD (M = 45.3%) b=0.22, t(114)=7.55, p<.01

• Children similarly accurate when reading (M = 59.2%) and listening (M = 61.0%) to the stories b=0.02, t(114)=0.97, p=0.33

• Effect of condition (reading vs. listening) similar for both groups b=-0.02, t(114)=-0.52, p=0.61

• Reading fluency (TOSREC), nonverbal IQ (WASI), phonological memory (NWR) predict performance; parent education, month in school, or sustained attention did *not*

• When included as covariates, group differences are smaller, but remain significant b=0.13, t(78)=2.74, p<0.01

Children struggle to infer verbs & adjectives

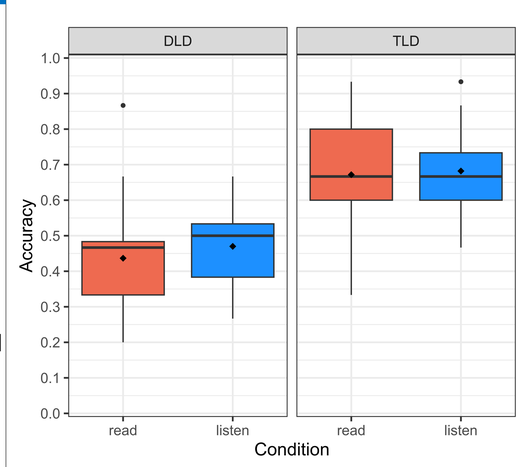
• Children more accurate at inferring nouns (M = 70.3%) than adjectives (M = 59.2%) b=0.11, t(171)=4.04, p<.01 and verbs (M = 50.8%) b=0.21, t(171)=7.59, p<.01

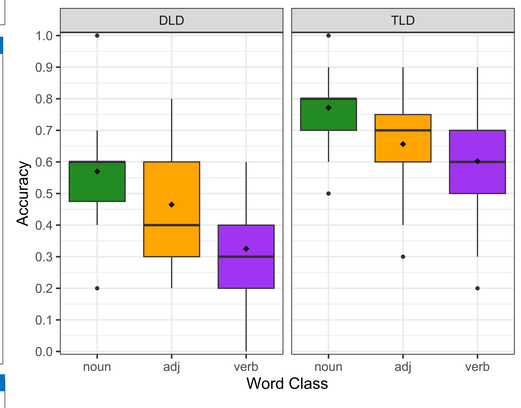
• Children more accurate at inferring adjectives than verbs b=0.10, t(171)=3.55, p<.01

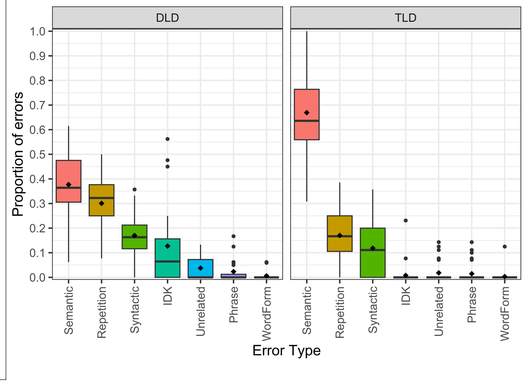
• Effect of word class (noun > adj > verb) did *not* differ between groups $\chi^2(2,171)=2.97$, p=0.23

Errors

• Semantic: true, but vague or too generic
  e.g., Luckily for the zebra, the little fly doesn't land on it
• Repetition: word from sentence or paragraph
  e.g., They do science experiments, fix the spacecraft or fix new equipment
• Syntactic: wrong word class or argument structure
  e.g., This avoids them from becoming pretty to a larger animal
• IDK: "I don't know"
• Unrelated: false or unclear
  e.g., A farmer was working on his land when his book hit something hard
• Phrase: multi-word answer
• Word Form: made-up or mispronunciation of a word
  e.g., He helped choose the place to icstruct our capital city







Conclusions

• Children with DLD are less accurate in inferring the meanings of words from text than their peers with TLD

• This difficulty is *not* specific to reading (inferring while listening is similarly compromised)

• Verbs and adjectives were more challenging than nouns for both groups

• Similar distributions of errors for both groups

• Interventions improving oral inferential comprehension[2] may improve reading outcomes for children with DLD

Disclosure

• Authors Ron Pomper, Deborah K. Reed, Nichole Eden, Timothy Arbisi-Kelm, and Karla K. McGregor have no conflicts of interest

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