

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) are less accurate than other children at inferring word meaning during shared book reading (Dawes, Leitão, Claessen, & Kane, 2019)
- Children with DLD tend to have difficulties with reading comprehension (Snowling, Hayiou-Thomas, Nash, & Hulme, 2020) and are less accurate at learning new verbs than nouns (Kan & Windsor, 2010)
- Compared to peers with typical language development (TLD), we hypothesized that children with DLD would be:
 - less accurate at inferring word meanings
- Their difficulties would be:
 - greater for written than spoken text
 - greater for verbs than nouns
 - correlated with measures of reading and cognition

Method

Participants

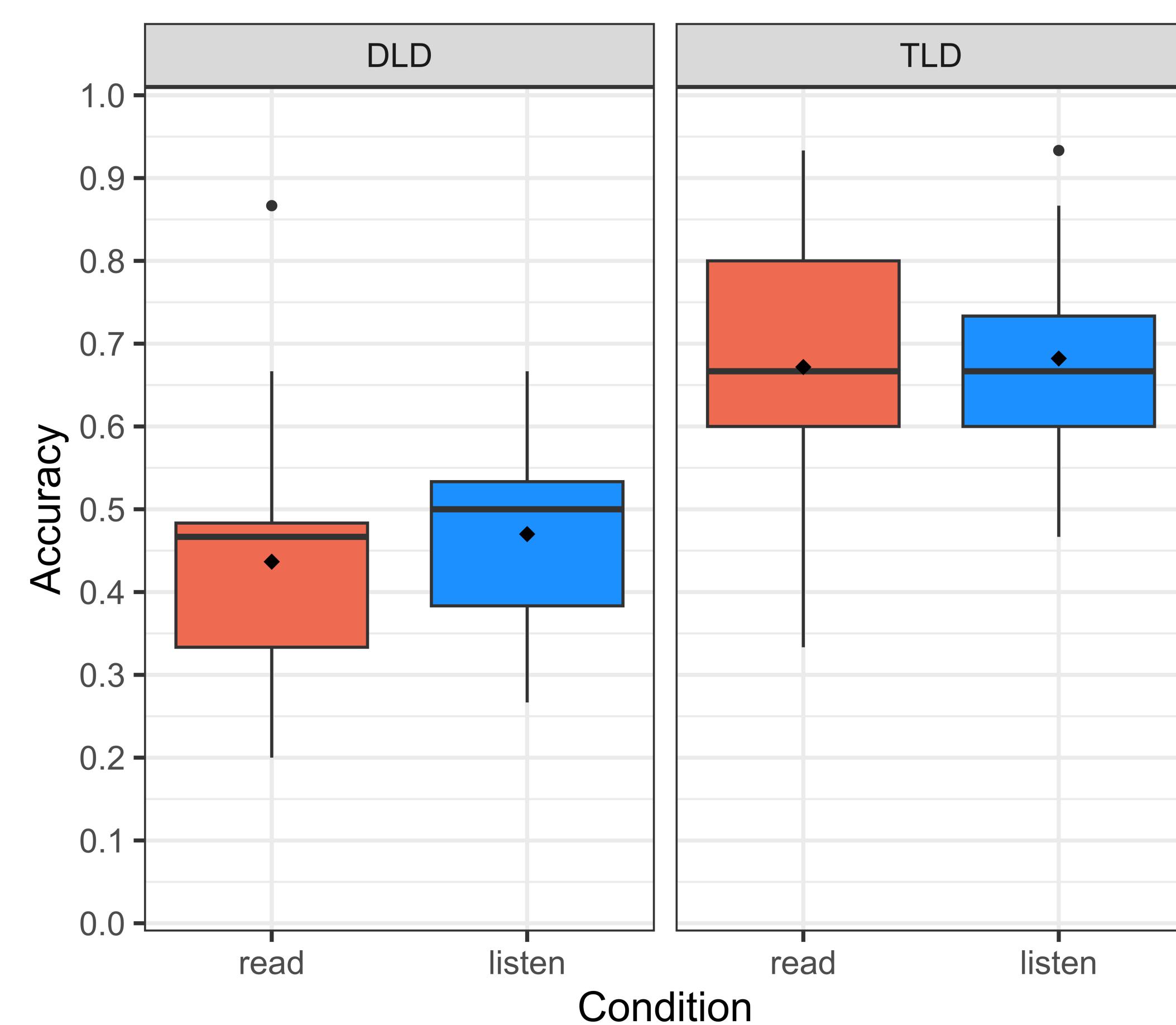
- 20 children with DLD & 39 children with TLD, between 9;5 and 11;1 years of age (4th grade)
- 3 additional children with DLD were unable to complete the reading portion of the task
- Children with DLD had a standard score below 92 on the Test of Narrative Language (92% sensitivity & specificity; Gillam & Pearson, 2017)
- Primarily English-speaking, normal hearing, nonverbal IQ > 70, no ASD or neurological disorders (except ADHD, epilepsy)
- Data collection part of an ongoing longitudinal study

Test of Inference

- Read 5 paragraphs & listened to an examiner read 5 paragraphs from grade 4 readers
- For each paragraph, one noun, one verb, and one adjective were replaced with blanks (30 total; 15 per condition)
- Children were asked to fill in the blanks with words
 - “Correct” if included in answer set from 20 adults
 - “Incorrect” answers were categorized by type

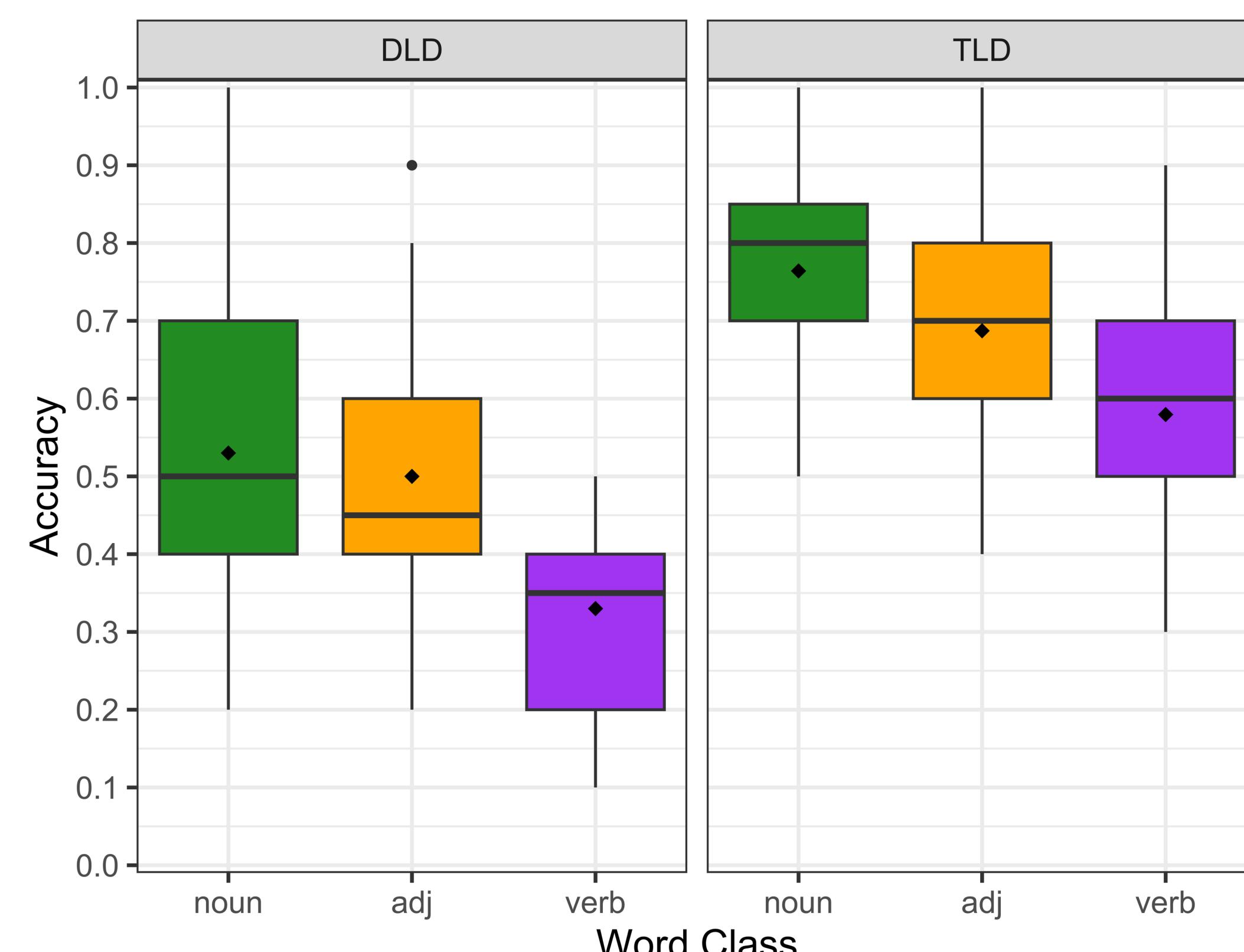
Children with DLD struggle to infer word meanings when reading & listening

- 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 (1 point increase in each associated with ~0.4% increase in accuracy)
- Parent education, month in school, and sustained attention did not predict performance
- When included as covariates, group differences are smaller, but remain significant $b=0.13$, $t(78)=2.74$, $p<0.01$



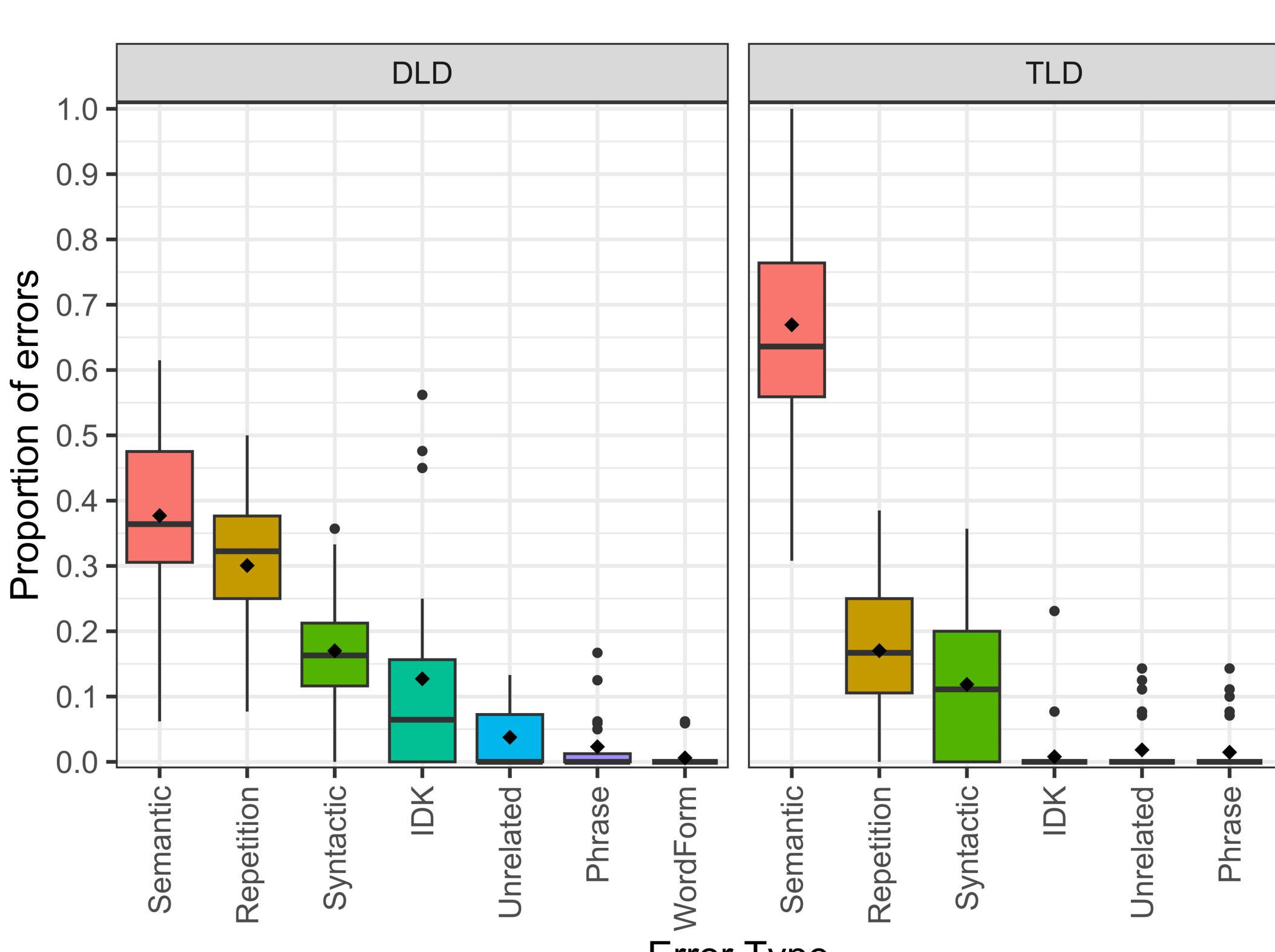
Children struggle to infer verbs & adjectives

- Children marginally more accurate at inferring nouns ($M = 68.5\%$) than adjectives ($M = 62.5\%$) $b=0.05$, $t(171)=1.92$, $p=.056$ and verbs ($M = 49.5\%$) $b=0.19$, $t(171)=6.92$, $p<.01$
- Children more accurate at inferring adjectives than verbs $b=0.14$, $t(171)=4.99$, $p<.01$
- Effect of word class (noun > adj > verb) did not differ between groups $\chi^2(2,171)=2.97$, $p=0.23$



“incorrect” answers

Category	Example	DLD	TLD
Semantic	Luckily for the zebra, the <u>little</u> fly doesn't land on it	0.38	0.67
Repetition	They do science experiments, fix the spacecraft or <u>fix</u> new equipment	0.30	0.17
Syntactic	This <u>avoids</u> them from becoming prey to a larger animal	0.17	0.12
IDK	I don't know	0.13	0.01
Unrelated	A farmer was working on his land when his <u>book</u> hit something hard	0.04	0.02
Phrase	Scientists think being super-slow helps sloths <u>be safe</u>	0.02	0.01
Word Form	He helped choose the place to <u>icstruct</u> our capital city	0.01	0.01



example paragraph



Pie Town's name hints at its history. It was once a rest stop for cowboys moving cattle further east. In the 1920s, a businessman started ____ing supplies and food—including pies—to the cowboys. His pies were so ____ that the spot became known as Pie Town! Pie Town isn't the only place in the U.S. with an unusual name. Many other towns have unique names. Some are named after local natural features, like Mexican Hat, Utah. It's home to a rock formation that looks like a hat called a sombrero, turned upside-down. Other place names honor people. In fact, Snowflake, Arizona, isn't named after snow, but after its two founders, Mr. Snow and Mr. Flake. Why do places need names at all? We use maps to show us the exact locations of places. You would have a hard time finding a city or ____ on a map if it had no name. The post office would have a tough time delivering people's mail too!

Conclusions

- Children with DLD are less accurate in inferring the meanings of words from text than 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
- For children with DLD, greater proportion of inferences do not match adults (“incorrect”), because of poor semantic fit, repetitions, or no responses
- Interventions improving oral inferential comprehension (e.g., Dawes, Leitão, Claessen, & Kane, 2019) may improve outcomes for children with DLD

Disclosure

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