Charting the Future: Longitudinal Insights into Reading Comprehension in Children with Developmental Language Disorder

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Background

- In the Simple View of Reading (SVR), reading comprehension is the product of word recognition and language comprehension (Gough & Tunmer, 1986).
- Word recognition and language comprehension are distinct skills, and both but are necessary for successful reading comprehension (Kendeou et al., 2009).
- Word recognition is supported by foundational skills, including phonological awareness and knowledge of letter and letter-sound correspondences.
- Developmental language disorder (DLD) is a persistent impairment in the ability to learn, understand, and use language.
  - Children with DLD often struggle with reading comprehension due to their difficulties with vocabulary, syntax and discourse.
  - Some children with DLD also struggle with the foundational skills that support word recognition, including phonological awareness and letter–sound knowledge. Those without word-reading difficulties may be less likely to be clinically identified (Catts et al., 2005; Duff et al., 2023).
  - By 4th grade, reading demands increase as students shift from learning to read to reading to learn, with texts requiring greater vocabulary, inferencing, and comprehension skills (Adlof et al., 2006; Duke & Cartwright, 2021; LARRC, 2015).

Research Question

How do 2nd grade students with DLD and average or below-average word reading skills perform on measures of reading accuracy, fluency, and comprehension in 4th grade?

Participants

- 20 children who met criteria for DLD in 2nd grade
- **Gender:** 10 male; 9 female; 1 not reported
- **Race:** Asian(5%), Black/African American (15%),White (75%)
- **Ethnicity:** Hispanic/Latino(10%), NotHispanic/Latino (90%)
- All met the following criteria for DLD:
  - scored ≤ 85 on the Core Language Standard Score of the Clinical Evaluation of Language Fundamentals, 5th edition (CELF-5; Wiig et al., 2013)
  - scored >70 on the Test of Nonverbal Intelligence-4th Edition (TONI-4; Brown et al., 2010)
  - normal hearing; no exclusionary biomedical conditions.
- Additionally, the Diagnostic Evaluation of Language Variation-Screening Test (DELV-ST; Seymour et al., 2003) was used to evaluate potential dialectal variation.

Methodology

- The Basic Skills Cluster (BSC) of the Woodcock Reading Mastery Tests (WRMT-3; Woodcock, 2011) is a measure of word-level reading proficiency, combining performance on the Word Identification subtest, which assesses the ability to recognize familiar printed words, and the Word Attack subtest, which measures the ability to decode unfamiliar or pseudowords.
- Scores from WRMT-3 BSC were used to subgroup children with DLD into those with average (> 85) or below-average (≤ 85) word reading skills in 2nd grade.
- Parents were asked whether their children had been previously diagnosed with dyslexia, DLD, or ADHD.

- **Table 1:** Test scores and parent-reported previous diagnoses of children with DLD with average or below-average word-reading scores in 2nd grade

Tests Completed in 2nd Grade	DLD-avgWR (*n* = 9)	DLD-lowWR (*n* = 11)
	Mean (*SD*)	Mean (*SD*)
CELF-5 CL SS	80.78 (4.06)	77.36 (6.70)
WRMT-3		
Word ID SS	92.89 (3.79)	72.55 (7.87)
Word Attack SS	95.89 (6.35)	78.45 (7.58)
BSC SS	93.78 (4.18)	74.27 (7.16)
Previous diagnoses reported by parents in 2nd grade	*n* (%)	*n* (%)
Dyslexia	2 (22%)	9 (82%)
DLD	3 (33%	1 (11%)
ADHD	3 (33%)	7 (78%)

- At follow-up (2 years later in 4th grade), children were re-administered formal tests to assess word reading ability and reading comprehension.
  - Word reading skills were re-assessed with the same subtests from the WRMT-3 BSC.
  - The Gray Oral Reading Test-5th Edition (GORT-5; Wiederholt & Bryant, 2012) was also administered, which measured accuracy, rate, fluency and comprehension of texts of increasing complexity.
  - The WRMT-3 provided a measure of isolated word reading skills, while the GORT-5 examined how well children could read and understand connected text.

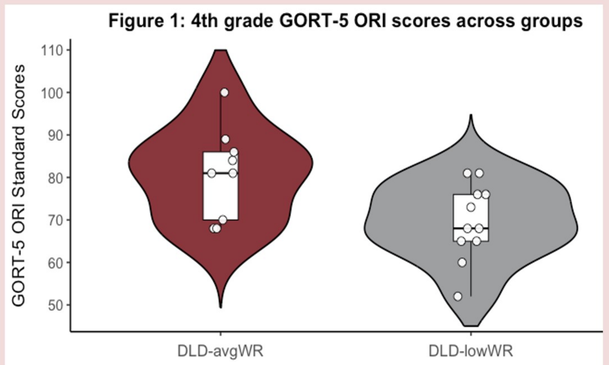
Results

- Mean WRMT-3 BSC scores in 4th grade were similar to 2nd grade for both groups, but there was more variability in 4th grade (see SDs in Tables 1 and 2).
- Within each group, some 4th-grade students showed significantly improved word reading, some maintained their level of performance, and some students showed significant declines.
  - In the DLD-avgWR group, 4 students scored below normal limits on this measure in 4th grade.
- Most participants scored below average on the GORT-5 ORI (see Figure 1) and mean scaled scores for all GORT subtests were below average for both groups (see Table 2).

- **Table 2:** Standard scores across groups in 4th grade

Tests Completed in 4th Grade	DLD-avgWR (*n* = 9)	DLD-lowWR (*n* = 11)
	Mean (*SD*)	Mean (*SD*)
WRMT-3		
Word ID SS	92.56 (10.91)	76.18 (13.53)
Word Attack SS	94.71 (16.46)	78.09 (9.44)
BSC SS	91.67 (12.98)	75.2 (10.13)
GORT-5		
Rate	7.67 (1.58)	5 (2.76)
Accuracy	6.33 (2.55)	3.73 (1.68)
Fluency	6.89 (2.03)	4 (1.84)
Reading Comprehension	6 (2.29)	4.64 (1.69)
Oral Reading Index (ORI) SS	80.78 (10.71)	69.55 (8.96)

Figure 1: 4th grade GORT-5 ORI scores across groups



- In the **DLD-avgWR group**, 7/9 students scored below normal limits on the GORT-5; the 2 within normal limits both received services, while only 1 of the remaining 7 did.
- In the **DLD-lowWR group**, all 11 scored below normal limits, and 6 were receiving speech or reading interventions.

Conclusions

- These results highlight significant 4th grade reading difficulties, including problems with reading comprehension, in individuals who were identified as having language difficulties in 2nd grade. 19/20 participants (95%) scored below the 25th percentile on the GORT-5-ORI in 4th grade.
- Most children with DLD exhibited difficulties across all subtests of the GORT-5 in 4th grade, including their accuracy of reading real words in text. Thus, even if they maintained or improved their ability to decode and recognize words presented in isolation, their scores on the GORT-5 suggest challenges reading in text.
- Importantly these challenges do not only affect accuracy and fluency but also comprehension at a time in school when children are expected to read to learn.
- Based on parent report, 11/20 participants (55%) had a prior diagnosis of dyslexia, whereas only 3/20 (15%) had a prior diagnosis of DLD.
- These findings underscore the high importance of early identification of DLD and supports for children to not only improve their word-level reading skills but also text reading and language/reading comprehension.

Clinical Implications

- **Early Identification and Screening:** Although legislation mandates early screening for dyslexia, universal screening for language is not common practice. Many children with DLD remain undiagnosed until reading and academic difficulties emerge. Children with DLD that have average word recognition in early grades are at risk for later comprehension challenges.
- **Language and Literacy Intervention:** Intervention should integrate language and literacy, targeting vocabulary, syntax, morphology, decoding, and comprehension strategies. Combined instruction supports the development of reading comprehension and overall academic success.
- **Awareness, Advocacy, and Collaboration:** Because DLD is common yet under-identified, professionals should promote awareness among caregivers and educators. Cross-disciplinary collaboration among SLPs, teachers, reading specialists, and psychologists is essential to provide comprehensive support for language and literacy development.

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