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Dialogic Reading with Integrated Vocabulary Enrichment: Case Study of a Second-Grade Student in Special Education

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Abstract

We present a case study of Ben, a second grader who was receiving special education for a speech-language impairment, literacy and numeracy deficits, and behavioral/emotional regulation in the 2019-2020 school year when the pandemic closed schools in March. To address his severe reading comprehension and vocabulary impairments, we provided our shared book-reading intervention called Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE), which involves adults using specific types of prompts to engage children in a dialogue about the story that will encourage development of their expressive language and vocabulary as well as advance their comprehension of the story. After nine 30-minute weekly sessions, Ben made substantial improvement in vocabulary and showed positive motivational gains.

Dialogic Reading with Integrated Vocabulary Enrichment: Case Study of a Second-Grade Student in Special Education

When U.S. schools closed their doors to in-person learning in mid-March 2020 due to the COVID-19 pandemic, no one could have predicted how extended school closures resulting in more than three months of remote learning would impact students' academic progress, particularly in reading and math skills. Now, more than one year later, we are beginning to gather evidence on COVID learning loss, which refers to the amount of academic progress students have made compared to the progress they would have made if there were no pandemic. While some data suggest that COVID learning losses in Grades 3-8 are greater for math than for reading, the amount of "COVID slide" for reading is still substantial (Kufeld & Tarasawa, 2020). Additional data indicate that the most pronounced COVID learning losses are observed for kindergarten reading skills and more specifically for oral reading fluency in students from first through fifth grade (Bielinski et al., 2020). Other estimates from reading data collected in 19 states suggest that COVID slide in reading may amount to loss of a full year of learning (Raymond et al., 2020).

Existing data collected thus far may be an underestimate of the actual learning loss that students have experienced since March 2020 because many U.S. schools remained closed for in-person learning throughout the 2020-2021 school year, or at best, provided students with a choice of remote or hybrid (in-person 2-3 days per week) schooling options during this time. Additionally, COVID learning losses may be exacerbated for students from low-income families, students of color, and students receiving special education services due to the lack of access to remote education from March 2020 onward, and in the case of special education, the lack of

adequate to services in this medium (Brandenburg et al., 2020; Dorn et al., 2020; Hill, 2020; Storey & Slavin, 2020).

This paper presents a case study of a second-grade boy who was receiving special education services in the 2019-2020 school year when the pandemic closed schools in March. This boy, who we named Ben, had been struggling with language delays and reading problems since kindergarten. At the end of kindergarten in 2019, he began receiving special education for a speech-language impairment and behavioral/emotional regulation. He started first grade in a new district during the 2019-2020 school year when the pandemic struck in March. During the 2020-2021 school year, the school district opened for hybrid instruction and his father sought assistance from our research lab in November 2020. We attempt to document how our experimental intervention, which we use in Title I schools to improve reading comprehension and vocabulary in first- and second-graders at-risk for reading failure, could be used as a supplemental intervention with a student who is receiving special education services for reading and language problems.

Despite Ben's many problems (see Results section), the school began focusing special education services to address his speech/language impairment and basic literacy/numeracy deficits, in addition to behavioral and attentional issues. Therefore, rather than duplicating the school's focus on these areas, we decided to provide an intervention that would address Ben's severe impairment in reading comprehension and vocabulary that was documented by our initial assessment data and test scores in Ben's IEP.

We decided to use our intervention called Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE), which is an evidence-based shared book reading approach designed to promote vocabulary development and reading comprehension in young readers. We developed

the DRIVE intervention based on the original dialogic reading (DR) method of Whitehurst and colleagues in which adults frequently ask questions about the story to engage children in a dialogue that encourages them to think about the story, express their thoughts, and make connections to their personal experiences (Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994; Whitehurst et al., 1988, 1999). Research on the original DR approach indicated that it facilitated the development of vocabulary and language skills in preschoolers from high poverty backgrounds (Lonigan, 1993; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1988, 1994).

In our previous research, we adapted DR for use with K-2 children in two ways. First, we streamlined the number of techniques that adults use when interacting with children. Our techniques are summarized by the EMPOWERED acronym (see the Method section for further detail). Second, we incorporated discussion of vocabulary words in the story using some of the EMPOWERED techniques because vocabulary knowledge facilitates reading comprehension and leads to reading success (Aarnoutse & van Leeuwe, 1998; Scarborough, 1998; Verhoeven et al., 2011).

Our studies using small elementary school samples from Title I schools have documented that 2 to 4 total hours of individual, 10-minute intervention sessions over 6 to 14 weeks can improve reading comprehension of at-risk Grade 1 and 2 students with below-average reading skills, narrowing the gap between these struggling readers and typically-achieving peers (Durwin et al.., 2016, 2018; Moore et al., 2018). Over 80% of first- and second-graders also reported feeling happy about participating in the DRIVE intervention, indicating a positive effect on children’s attitudes and motivation to read (Durwin et al., 2018).

This case study documents Ben's academic progress and motivational changes as a result of the DRIVE intervention over a four-month period in 2021. Our goal as researchers is to investigate and document the efficacy of approaches that schools could subsequently adopt for their own use. Therefore, this case study provides some initial data on whether DRIVE could be used in special education settings as a supplemental intervention to improve reading comprehension and vocabulary.

Method

Participant

Ben's IEP, implemented at end of kindergarten, recommended speech-language therapy and resource room instruction on literacy and numeracy skills. The new school began implementing his IEP in 2019-2020 and provided remote intervention as best it could after March 2020. Ben's native language is English and he was a second grader (age 7-1) when we initially tested him in November 2020.

Assessments

Table 1 provides descriptions and scoring of the assessments we administered in November 2020 and May 2021. The primary assessments used in our research to evaluate the efficacy of DRIVE with first and second graders are the Test of Silent Reading Efficiency and Comprehension (TOSREC) to measure reading comprehension and the Word Test-3 (WT3) Synonym and Antonym subtests to measure vocabulary. We administered these at the initial testing along with the Test of Word Reading Efficiency (TOWRE-2) and the Digit and Letter Rapid Naming subtests of the CTOPP-2. At post-test, we eliminated TOWRE-2 and CTOPP-2 because they were not directly relevant to the intervention. Instead of TOSREC, we administered the CELF-5 Sentence Comprehension subtest (assessing oral comprehension) because we

believed it would be a more sensitive measure for evaluating the impact of the intervention. TOSREC relies on efficient word recognition and decoding, which Ben was struggling to develop (see Table 4).

Intervention

Table 2 shows the EMPOWERED techniques used in our DRIVE intervention during shared book reading, along with examples of each technique. The intervention is individually-administered and typically delivered in 10- to 15-minute sessions in schools. Because Ben received intervention once-a-week, sessions typically took about 30 minutes. Ben completed eight books over nine intervention sessions from February to May 2021, yielding 255 total minutes (4.25 hours).

Testing Procedure

Tests were individually-administered in our lab by the first author or by a trained, supervised undergraduate research assistant. Tests, which were introduced as "reading games," take about 10 minutes each to administer. At the initial testing, Ben was hesitant and needed coaxing to attempt the tests. The battery of four tests took approximately 75 minutes with breaks in between. At the final testing, the two tests were administered on separate days (a procedure we typically use in schools).

Results and Discussion

Ben's kindergarten IEP indicated struggles in letter-sounds, word recognition, letter formation, counting to 100, and number values. The IEP specified that Ben's speech/language impairment prevented him from profiting from classroom instruction. Of note were his impaired expressive and receptive language skills (see Table 3).

Table 4 shows Ben's vocabulary and comprehension performance at our initial and final testing. Ben gained 1 standard deviation (SD) on the WT3 Synonyms subtest, from a standard score of 70 (2 SDs below average) to a score of 85, and gained two-thirds SD on the Antonyms subtest from 70 to 80. Put in context, first graders in our intervention improve, on average, from a mean standard score of 92.05 to 104.42 (a 12.37-point difference) on Synonyms and from 86.25 to 94.56 (a difference of 8.31) on Antonyms. Importantly, Ben initially performed significantly below the children we work with in schools and made greater gains comparatively—15 and 10 standard-score points on Synonyms and Antonyms, respectively.

Ben's motivation also improved. Initially, he was reluctant to answer open-ended and Wh-questions. Toward the end of the intervention, he began to spontaneously ask the interventionist questions related to the story, indicating an intrinsic interest in what he was reading. An attitude survey (see Figure 1) indicated that Ben considered the intervention a positive experience, consistent with results from children receiving our intervention in schools (Durwin et al., 2018).

We acknowledge the limitations of case study data. The history threat to internal validity is an issue. There could have been many experiences in this span of time that contributed to Ben's improvement, including his special education services at school. However, according to Ben's IEP, the school was not focusing on vocabulary or reading comprehension. Their primary goals were his expressive language, behavioral issues, and basic literacy and numeracy skills. Our switch in comprehension measures from the TOSREC at the initial testing to the CELF-5 Sentence Comprehension subtest at the final testing is clearly another limitation, but this was a necessary change in order to assess Ben's comprehension in a way that did not involve word

recognition and decoding. Lastly, we cannot generalize regarding the effectiveness of this intervention beyond this one student.

These case study results, nevertheless, are important as additional evidence supporting the validation of our DRIVE intervention toward our goal of providing schools with easy-to-use and effective assessments and interventions that would improve their Response-to-Intervention implementation. The DRIVE intervention is free because it is not a commercial program; it is easy to train individuals to implement the approach, even those with little formal training in reading or education; it is also a quick intervention that takes just minutes per day (Moore & Durwin, in press). Many districts lack the time, budget, and resources to efficiently remediate children's reading problems, especially schools in urban areas where the caseload of students needing intervention exceeds a school's personnel and resources, and all students who need intervention cannot be adequately served (Abbott & Wills; Abbott et al., 2008). The COVID learning losses that children have experienced over the last 18 months will compound this problem. These case study results, while preliminary, add to the existing data on the DRIVE intervention as a promising approach for schools that are under tremendous pressure to improve the achievement of struggling readers.

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Table 1

Lab Assessments Administered at Initial and Final Testing Sessions

Test	Description	
	Administration	Scoring
Test of Silent Reading Efficiency and Comprehension (*TOSREC)*	Examinees are given 3 minutes to read sentences from a grade-level test booklet and decide whether each sentence is true or false (e.g., "A cow is an animal.").	Raw scores are converted to grade-based standard scores with a mean of 100 and a SD of 15.
The Word Test-3	Subtests: • Synonyms: 'Tell me another word for…(spoken word)?' • Antonyms: 'What is the opposite of…(spoken word)?'	Raw scores are converted to age-based standard scores with a mean of 100 and a standard deviation (SD) of 15.
Test of Word Reading Efficiency-2 (TOWRE-2)[a]	Subtests: • Sight Word Efficiency (words) • Phonemic Decoding Efficiency (nonwords) In each subtest, examinees have 45 seconds to read as many real words or nonsense words as they can from a list.	Raw scores are converted to age-based standard scores with a mean of 100 and a standard deviation (SD) of 15.
CELF-5 Sentence Comprehension[b]	Examiner says a sentence and students pick which of four pictures represents the spoken sentence.	Raw scores are converted to age-based scaled scores with a mean of 10 and a standard deviation (SD) of 3.
CTOPP-2 Rapid Naming Subtests (Digits and Letters) [a]	For each subtest: • Examinees name the items on a page as quickly as possible. • Total amount of time and number of errors are recorded.	Total time (per subtest) is converted to an age-based scaled score with a mean of 10 and a standard deviation (SD) of 3.

[a] administered only at initial testing in November 2020; [b] administered only at final testing in May 2021.

Table 2

Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE) Techniques

Technique		Example
E*ncourage Vocabulary*	Discuss what vocabulary words mean within the story using Wh-questions, expansion, encouraging repetition, and evaluation techniques.	● Adult: What do you think **gaze** means? ● Child: (shrugs shoulders) ● Adult: "Do we gaze with our ears (tugging ears) or our eyes (using binocular mime)?" ● Child: "Our eyes!" ● Adult: "So, what do we do when we gaze?" ● Child: "We look with our eyes."
M*ake it fun*	Have fun reading and keep the dialogue light and engaging.	● Use an upbeat tone of voice ● Use mime and movements
P*rompt* frequently	Prompt the child to identify vocabulary in the story and talk about the story and its characters.	● "What does this word mean?" ● "Tell me what's going on here."
O*pen-ended questions*	Encourage children to respond in their own words using more than a one-word answer.	● "What's happening in the story?" (a good way to prompt recall when reading extends over multiple sessions) ● "Why do you think she's unhappy?" ● "What will happen next?" ● "How would you feel if you were (the character)?"
W*h-Questions*	What, where, and why questions (most of which are open-ended)	● "What do you think will happen next?" ● "Why did Jack stay home from school?" ● "Where do you think the family is going?
E*xpand* the child's responses	Model slightly more advanced language by repeating what the child says, but with a bit more information or in a more advanced form.	● Adult: "What do you see on this page?" ● Child: "wagon." Adult: "Yes, that's a red wagon. Now you tell me what it is." ● Child: "That's a dog." Adult: "Yes, that's a dog. It's a kind of dog called a beagle. Now you tell me what it is."
Encourage ***R****epetition*	Encourage the child to *repeat* the expanded utterance	● Adult: "Who do you think Mrs. Toggle is (question prompt from the story title and picture)? ● Child: "Teacher." ● Adult: "Yes, she could be a teacher. Can you say: 'I think Mrs. Toggle is a teacher?'"
E*valuate* the child's responses	Praise the child's correct responses and gently offer alternative labels or answers for incorrect responses.	● "Well, it looks like a horse, but we would call that animal a cow." ● "Well, Joey might have wanted to go to the park, but remember that Joey went to the circus in the story?"
D*istancing prompts*	Ask questions that involve personal connections of book to the child's own life.	● "Louis' mom did not want him to keep the frog as a pet. Do you have any pets?" ● "Tonya's mom is preparing her lunch. What do you like to eat for lunch?"

Table 3

Ben's Academic Performance on School-Administered Tests from his IEP

	Standard Score
Kaufman Test of Educational Achievement-3 (KTEA-3)	
Reading Composite	87
Math Composite	81
Written Expression	83
Test of Early Language Development-3 (TELD-3)	
Receptive Language	73
Expressive Language	88
Spoken Language Quotient	77
Expressive One-Word Picture Vocabulary Test	75
Receptive One-Word Picture Vocabulary Test	99

Table 4

Ben's Performance on Lab-Administered Tests at Initial and Final Testing Sessions

	Initial Testing Standard Score [a]	Final Testing Standard Score [a]
Test of Silent Reading Efficiency and Comprehension (TOSREC)	62	--
CELF-5 Sentence Comprehension	--	9[b]
Word Test-3		
Synonyms	70	85
Antonyms	70	80
Test of Word Reading Efficiency-2 (TOWRE-2)		
Sight Word Efficiency	73	
Phonemic Decoding Efficiency	68	

Note: CTOPP-2 Rapid Naming results are not shown because they were invalidated due to a high rate of errors (per the manual instructions) and inaudible speech produced by masking (per COVID-19 regulations) a child with a speech impairment.

[a] All standard scores (except CELF-5 Sentence Comprehension) have a mean of 100 and SD of 15.

[b] This is a scaled score with a mean of 10 and SD of 3. A scaled score of 9 is within average range.

Figure 1

Ben's Rating of Dialogic Reading Intervention

Feelings about Dialogic Reading

Instructions: Before we begin reading today, I'd like to ask you about our reading time.

How did you feel most of the time when you read [a story] with me or one of the other reading buddies? Which face matches how you felt most of the time?

What was your favorite book that we read? [*RA: remind the child what books they read*] Why was it your favorite? *[RA: write the book and reason in the space below]*

Miss Nelson is Back because he liked how the students talked about the mean substitute teacher to show their appreciation for Miss Nelson.