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Cheryl C. Durwin

Southern Connecticut State University, durwinc1@southernct.edu

Dina Moore

Southern Connecticut State University, moored14@southernct.edu

Madeline Barrett

Southern Connecticut State University, barrettm22@southernct.edu

Karlos Mate

Southern Connecticut State University, matek1@southernct.edu

Claudia McKenley

Southern Connecticut State University, mckenleyc1@southernct.edu

See next page for additional authors

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Authors Cheryl C. Durwin Velasquez	Dina Moore, Madeline Barrett, Karlos Mate, Claudia McKenley, Daniela Sevilla, and Carla	Э

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Cheryl C. Durwin, Dina Moore, Madeline Barrett, Karlos Mate, Claudia McKenley, Daniela

Sevilla, and Carla Velasquez

Psychology Department

Southern Connecticut State University

Paper presented at the conference of the Northeastern Educational Research Association, Trumbull, CT, October 19, 2022. Correspondence may be sent to Cheryl C. Durwin at durwinc1@southernct.edu.

Abstract

This pilot study explores whether dialogic reading can be implemented as a cross-age tutoring intervention. We trained older children (Big Buddies) to read to younger children (Little Buddies) using an intervention called Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE). DRIVE is a shared book-reading approach in which adults ask open-ended questions and encourage children to develop oral language and vocabulary through scaffolding, modeling, and praise using various strategies summarized by the acronym, EMPOWERED. Trained research assistants (RAs) taught Big Buddies to use the approach in a single session lasting less than one hour. Big Buddies subsequently read to a Little Buddy in a separate session about one week later. The RAs recorded the Big Buddy's use of EMPOWERED strategies in the training session and in the paired reading session. We present frequencies of strategy usage for Big Buddies and anecdotal observations of RAs as an initial means of evaluating whether it is feasible to teach older elementary readers to deliver dialogic reading to younger children. Based on these results, plans are underway to conduct a larger-scale cross-age dialogic reading intervention in a Title I school.

Can Cross-age Tutoring Using Dialogic Reading Be a Feasible Post-Pandemic Intervention?

Background and Purpose

Students have experienced significant learning loss from long-term remote and hybrid education as a result of the COVID-19 pandemic. In Fall 2020, elementary school students were estimated to be about 1 to 4 months behind 2019 levels (Bielinski et al., 2020). During 2020-2021, students made gains at a lower rate compared to before the school closures, and they ended the year with lower achievement compared to a typical pre-pandemic year, with proportionately fewer gains made by students from minority backgrounds and high-poverty schools (Lewis et al., 2021). Recent results from the National Assessment of Educational Progress (NAEP) revealed that in 2022, 37% of fourth-graders scored below basic level in reading compared to 34% in 2019, a significant change, with the largest 3-year gaps observed for the bottom two quintiles of students (NCES, 2022).

Education and public policy experts have proposed tutoring as a solution for students who were most adversely affected by pandemic learning loss (Kraft & Falken, 2021). Compared to other alternatives that have been offered, such as an extended school day or year, summer school, or after-school programs, tutoring has the largest overall impact on student achievement and can be scaled up (reaching more students in more schools) at relatively low cost (Dietrichson et al., 2021; Kraft & Falken, 2021). Cross-age tutoring, in particular, is promising as a scaled-up intervention for addressing COVID learning loss because of its low cost and evidence supporting enhanced academic achievement of both tutors and tutees (Education Endowment Foundation, 2018; Kraft & Falken, 2021; Leung, 2019).

This paper explores the possibility of scaling up a dialogic reading intervention in the form of cross-age tutoring as an efficient way to improve the reading comprehension and vocabulary of both older and younger elementary school students. Our intervention, called Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE), is a shared book reading approach designed to promote vocabulary development and reading comprehension in early elementary readers, which we developed based on the original dialogic reading method of Whitehurst and colleagues (Lonigan, 1993; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold et al., 1994; Whitehurst, Falco et al., 1988). Over the past several years, we have conducted small-scale community-based participatory research with Title I schools in which we trained undergraduate research assistants to implement the approach one-on-one with first and second graders at risk for reading problems. Our studies have indicated that 2 to 4 total hours of individual, 10-minute intervention sessions over about 6 weeks can improve reading comprehension of at-risk Grade 1 and 2 students who have 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 positive feelings about participating in the DRIVE intervention, indicating a beneficial effect on children's attitudes and motivation to read (Moore et al., 2018).

Because our goal has been to provide schools with easy-to-use and effective interventions that would help them improve children's reading success, we are interested in whether the DRIVE intervention can be scaled up by using a cross-age tutoring approach instead of individual research assistants. In the summer of 2022, we planned a pilot study at a camp to determine whether it is feasible to teach the approach to older elementary readers and how training and implementation might need to be modified to ensure success of the intervention. The

research site fell through a week before the start of data collection. In an effort to salvage the pilot study, we recruited children from surrounding communities (through flyers and social media posts) to participate in a brief cross-age dialogic reading pilot in our campus lab.

Method

Participants

Eight children participated (5 females and 3 males). Four were older children referred to hereafter as Big Buddies (median age of 11.23), and four were younger children who were designated as Little Buddies (median age of 6.76). The Big Buddies were two pairs of siblings. Big Buddies recently completed grades 3, 5, and 9, and Little Buddies recently completed kindergarten, first, and second grade. All children spoke English as their first language. Three Little Buddies also spoke another language at home (2 siblings spoke French and 1 child spoke Spanish). One Big Buddy's mother revealed that he had ADHD and autism spectrum disorder.

Intervention

DRIVE is a shared book-reading approach in which adults ask open-ended questions and encourage children to develop oral language through scaffolding, modeling, and praise using EMPOWERED strategies shown in Table 1 (Moore & Durwin, 2022). The intervention is individually-administered and typically delivered in 10- to 15-minute sessions in schools. The procedure for the training and implementation of the cross-age intervention is outlined in Table 2. The reading logs for Big Buddy training (i.e., teaching Big Buddies to use DRIVE) and the Dialogic Reading Buddies cross-age implementation (i.e., paired reading sessions) are shown in Figure 1.

Reading Attitude Survey

Children were given a reading attitude survey at the beginning and end of the study. The Big Buddy and Little Buddy versions of the survey are shown in Tables 3 and 4, respectively, with section one of the survey administered at pre- and post-test and section two administered only at post-test. Data from the reading attitude survey are not the focus of this paper.

Procedure

The study took place over three weeks from July 18 through August 4, 2022. Children were given a reading attitude survey at their first and last session. Table 2 outlines a detailed description of the Big Buddy training session (summarized in Phase 1 and 2) and Dialogic Reading Buddies cross-age intervention (summarized in Phase 3).

During the first week, Big Buddies were individually trained by a research assistant (RA) in a single session lasting about 45 minutes, with the exception of two siblings who were trained together. In the first half of the session, the RA read to the Big Buddy, engaged the child in a dialogue using EMPOWERED strategies, and explained and demonstrated the strategies as they were used. In the second half of the session, the Big Buddy read to the RA and practiced using the EMPOWERED strategies with the RA prompting the use of strategies as needed.

Immediately after the session, the RA used a reading log (shown in Figure 1a) to record the strategies that the Big Buddy used at least once.

The remaining two weeks involved the cross-age DRIVE intervention called Dialogic Reading Buddies. In a 30- to 60-minute session, a Big Buddy read to a Little Buddy under the supervision and scaffolding of an RA who also recorded the EMPOWERED strategies used by Big Buddies at least once (see Figure 1b) as well as open-ended notes. The length of the session varied depending on several factors such as: the developmental level and attention of the Little

Buddy, the length of the book, and the amount of dialogue generated by the Big Buddy. Two Big Buddies read to a Little Buddy once, and two Big Buddies reading to two different Little Buddies in separate sessions over the span of the study.

Results

Because this was a pilot study, our results are descriptive and serve to provide initial data on whether older children (i.e., Big Buddies) can learn and implement the DRIVE approach.

In the single training phase (Phase 2 in Table 2) in which Big Buddies practiced using the EMPOWERED strategies while reading to the RA, three of the four Big Buddies used all the strategies at least once. One Big Buddy, who happened to be the youngest child in the group, did not spontaneously use Make it fun, Open-ended questions, and Expansion. The absence of Make it fun could be due to the fact that the child reading to the research assistant for practice is an artificial situation, unlike when reading to an actual child. We have witnessed this with our own research assistants in training sessions whereby it seems awkward to use strategies to make the reading experience fun when practicing with other adults. It is unclear why the Big Buddy did not spontaneously use Open-ended questions. We did notice, however, that sometimes a Big Buddy would first ask a closed-ended question (e.g., "Do you think Miss Swamp is good or bad?"), then follow-up with a Wh-question which also happens to be an Open-ended question (e.g., "Why do you think she is bad?"). Consequently, the research assistant may not have marked the question as both Open-ended and a Wh-question. Lastly, Expansion is typically the most challenging strategy, which we have documented with our own research assistants as well (Chiaraluce, 2018; Faber, 2018; Moore & Durwin, 2022).

Table 5 shows the frequency of EMPOWERED strategy usage in Phase 3, the cross-age individual Dialogic Reading Buddies sessions that occurred about a week after the training.

Overall, Big Buddies applied the strategies with relatively high frequency, with the exception of Open-ended, Expansion, and Repetition, which were used only 50% of the time. The low frequency of Open-ended questions may be due to RAs failing to recognize that Wh-questions which have more than one possible answer should also be coded as Open-ended. With respect to Expansion and Repetition, our previous research has found that these are the most challenging for our own research assistants to use when reading with children (Chiaraluce, 2018; Faber, 2018; Moore & Durwin, 2022). The reader might feel especially awkward about using Repetition. This particular strategy seems unnatural or artificial because in everyday language we do not ask the conversational partner to repeat what we have just said.

Research assistants also wrote anecdotal observations of each Big Buddy's strengths and weaknesses after the Dialogic Reading Buddies session(s), some of which are summarized in Table 6. They noted additional factors that may impact how well the Big Buddy is able to apply the DRIVE approach and effectively use the EMPOWERED strategies. For example, the personality of the Big Buddy, whether introverted or more outgoing, can impact whether the child can develop rapport with the Little Buddy, read in an engaging way, and Make it fun. The reading skill, specifically the Big Buddy's own background knowledge and vocabulary, may also affect how well the reader can ask good questions that promote dialogue and Encourage vocabulary.

Discussion

Our original plan was to conduct a study at a summer camp for children ages 6 through 12, in which we would train the Big Buddies on the DRIVE approach using brief, small group sessions that were similar to the 10-minute individual sessions that we have used in schools between research assistant and child. Pre- and post-testing of Big Buddies and Little Buddies of

vocabulary and reading comprehension was also planned for the camp study. The abbreviated pilot study in our campus lab discussed in this paper was an attempt to salvage our plans for investigating the efficacy of a cross-age dialogic reading intervention and serves as an initial attempt to obtain data on whether older children can readily learn and implement the DRIVE approach.

In this paper, we presented preliminary descriptive data on the feasibility of teaching older elementary readers to use the approach. The results suggest that older children can successfully learn the DRIVE approach and use its EMPOWERED strategies with minimal training. This finding is especially encouraging given that we originally envisioned a longer Big Buddy training involving 10- to 15-minute sessions on consecutive days over a span of 1 to 2 weeks using two books rather than one—a procedure that would have given the older children extensive practice using EMPOWERED strategies before being paired with a younger child.

Our pilot data also provided useful feedback that will help us improve the Big Buddy training in the future. For example, Expansion and Repetition may be particularly challenging for children to implement, which may translate to a need for greater emphasis on these strategies during training. Training on the Encourage vocabulary strategy may also need additional emphasis. In our school-based research, the books we use have small post-it notes with a vocabulary word from the page written on the note. These notes placed on pages are prompts for our research assistants to stop and ask about those particular words on the page. During our training, research assistants brainstorm ways that a child might explain the vocabulary word, and they practice various scaffolds for encouraging children to develop an understanding of the word, such as using mime or personal connection questions in the form of Distancing prompts (Moore & Durwin, 2022). Clearly, the abbreviated, single-session training of the Big Buddies did not

allow us to provide extensive focus on how to Encourage vocabulary. Also, the individual differences of elementary school children in their own vocabulary and background knowledge may pose an additional challenge to address in training and cross-age implementation.

We acknowledge the obvious limitations in this study such as the small, biased sample resulting from our recruiting methods and the lack of pre- and post-tests to evaluate whether the cross-age DRIVE intervention could improve the vocabulary and comprehension of both the Big Buddies and Little Buddies. We were also only able to provide one training session for the Big Buddy and one to two paired reading sessions, which contrasted with the original plan of the training and cross-age intervention extending over many sessions. This adjustment clearly limited the opportunity of Big Buddies to practice both during training and during the cross-age intervention. Additionally, while the campus lab provided a quiet, highly-structured environment with few distractions, this setting did not allow us to observe what older elementary students can do in a more realistic setting such as the school.

Based on our findings, there are several ways the cross-age intervention could be improved. First, as previously mentioned, providing a longer training period would improve the Big Buddies' use of EMPOWERED strategies, especially those identified as challenging for adults to use (e.g., Encourage vocabulary, Expansion, Repetition). Second, one research assistant suggested that there should be a brief review of the EMPOWERED strategies before the Dialogic Reading Buddies session with the younger child. Given that the Dialogic Reading Buddies session occurred about a week after the single training session, this was an important suggestion for the present study conducted in the campus lab. However, it may not be needed in a school setting with the type of training that was originally planned. As previously mentioned, the original training planned for the camp study involved reading two books in a small group format

spaced over several sessions (spanning about 1-2 weeks). This training format would have provided Big Buddies more opportunity to be exposed to the EMPOWERED strategies and to practice them in different story contexts before proceeding to the Dialogic Reading Buddies phase. The efficacy of this original training format will be explored in a school-based study that is presently underway. A final suggestion provided by one of the research assistants is that the rapport between Big Buddy and Little Buddy could be improved by pairing the same two children for the duration of the cross-age intervention. This may not be possible in a school setting given scheduling constraints, but it is an interesting avenue to explore.

The results of this pilot study provide encouraging findings suggesting that older children can, in fact, learn to use the DRIVE approach. Based on this, a larger scale study is currently in progress at a Title I school to more systematically evaluate the efficacy of a cross-age DRIVE intervention. Dialogic Reading with Integrated Vocabulary Enrichment is a low-cost approach requiring only time for training and available picture books. Another advantage yet to be explored is whether older children with below-average vocabulary and comprehension can effectively learn and use the DRIVE approach, thereby maximizing its efficacy as a cross-age tutoring intervention by simultaneously helping both older and younger elementary school students to improve their reading skills. Currently, there are mixed findings regarding which students benefit most from tutoring, with some research pointing to larger effects for lower-achieving students (Kraft, 2015; Kraft & Falken, 2021). We encourage other researchers to investigate DRIVE as a cross-age intervention using older readers of varying abilities and to explore other methods of cross-age tutoring as low-cost, scaled-up approaches for addressing COVID learning loss.

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Table 1

Dialogic Reading with Integrated Vocabulary Enrichment (DRIVE) Techniques

Strategy	Description	Example
Encourage Vocabulary	Discuss what vocabulary words mean in the context of the story using Wh-questions, expansion, encouraging repetition, and evaluation strategies.	 Adult: What do you think scattered means? Child: (shrugs shoulders) Adult: "Do you sometimes have toys or clothes all over the floor at home?" Child: "Yes, my toys." Adult: "So, your toys are scattered all over the floor. Now you tell me what scattered means." (repetition) Child: "When something is all over the place." Adult: "Yes! Scattered means when objects are laying around all over. (evaluation and expansion).
Make it fun	Have fun reading and keep the dialogue light and engaging.	 Use an upbeat tone of voice Use mime and movements Reduce the amount of questions if children become annoyed, disinterested, fatigued, etc.
Prompt frequently	Prompt the child to identify vocabulary in the story and talk about the story and its characters.	 "What does this word mean?" "Who is this person (pointing to a character)?" "What is going on here in the story?"
Open-ended questions	Encourage children to respond in their words using more than a one-word answer	 "What happened in the story when we read last time?" (good prompt for resuming a reading session) "Why do you think he is sad?" "What do you think will happen next?" (good prompt for ending a reading session) "How would you feel if you were (the character)?"
Wh- Questions	What, where, and why questions	 "What can (the character) do to solve the problem?" "Where do you think she is going?" "Why do you think Jim was miserable?"
Expand 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: "Why was Balto a hero?" Child: "He saved people." Adult: "Yes, Balto saved people because he delivered medicine to children who were very sick."

Encourage Repetition	Encourage the child to <i>repeat</i> 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?""
Evaluate the child's responses	Praise the child's correct responses. Use specific praise rather than non-specific praise such as "Good job!" Gently offer alternative labels or answers for incorrect responses.	 "That's an interesting prediction!" "I like how you explained what the character was feeling." "Well, it looks like Santa's sleigh, but this is a dog-sled. Dogs pull it across the snow.
Distancing prompts	Ask questions that encourage personal connections of book to the child's life	 "Have you ever been blueberry picking like Sal?" "Tanya is making snow angels. What do you like to do when it snows?"

Table 2

Procedure for Training and Implementation of the Cross-Age DRIVE Intervention

Phase	Activity
Phase 1	Research assistants (RAs) individually trained Big Buddies in a 45- to 60-minute session. The RA read the first half of <i>Louise</i> , <i>Adventures of a Chicken</i> to Big Buddies, stopping to ask questions using the EMPOWERED strategies and pointing out the strategy used with a training guide similar to Table 1.
Phase 2	In the same initial session, an RA and Big Buddy read the second half of <i>Louise</i> , <i>Adventures of a Chicken</i> . The Big Buddy took the role of the reader who read to the RA and used the strategies, with the RA scaffolding the reader's use of strategies, as needed. The RA recorded strategies used and open-ended notes on a reading log.
Phase 3	In the 45- to 60-minute cross-age intervention sessions (a week later), the Big Buddy and Little Buddy chose a book from a selection of books. ² The Big Buddy read to a Little Buddy with an RA present to scaffold, as needed, and to record EMPOWERED strategies on a reading log. ³ Because books were relatively short, the pair completed two books in one session (with the exception of one Dialogic Reading Buddies session).

¹ One training session contained two Big Buddies who were siblings. The small group format was how the training was originally envisioned.

² Books: Grandpa's Teeth, Louise: The Adventures of a Chicken, Professor Fergus Fahrenheit and His Wonderful Weather Machine, Miss Nelson is Missing, Miss Nelson is Back, The Principal's New Clothes, The Bravest Dog Ever: The True Story of Balto, The Wolf's Chicken Stew, Professor Fergus Fahrenheit and His Wonderful Weather Machine.

³ Two Big Buddies read to a different Little Buddy at two separate sessions.

Table 3

Attitude Survey for Big Buddy Reading Partner

All	All items, except item 11, use the following response scale:									
Sec	Section One (at pretest and post-test) Section Two (at post-test)									
1.	How do you feel about reading at home?	6. I liked reading with my reading buddy.								
2.	How do you feel about spending your free time reading?	7. Even though the stories I read with my reading buddy were for younger children, I found them interesting.								
3.	How do you feel about reading during summer vacation?	8. Reading together with a reading buddy was fun.								
4.	How do you feel about reading instead of playing?	9. I would like to be a reading buddy to a younger child in school next year.								
5.	How do you feel when it is time for reading in school?	10. I liked talking about the stories with my reading buddy.								
		11. What was your favorite book that you read with your reading buddy? Why was it your favorite? (open-ended)								

Note: Items 1 through 5 are from McKenna and Kear (1990).

Table 4

Attitude Survey for Little Buddy Reading Partner

All items, except item 11, use the following response scale:									
Section One (at pretest and post-test)	Section Two (at post-test)								
1. How do you feel about reading at home?	6. I liked reading with my reading buddy.								
2. How do you feel about spending your free time reading?	7. The stories I read with my reading buddy were interesting.								
3. How do you feel about reading during summer vacation?	8. Reading together with a reading buddy was fun.								
4. How do you feel about reading instead of playing?	9. I would like to read with a reading buddy in school next year.								
5. How do you feel when it is time for reading in school?	10. I liked talking about the stories with my reading buddy.								
	11. What was your favorite book that you read with your reading buddy? Why was it your favorite? (open-ended)								

Note: Items 1 through 5 are from McKenna and Kear (1990).

Table 5

Frequency of EMPOWERED Strategies Used by Big Buddies during Dialogic Reading Buddies

Sessions

	<u>E</u> ncourage Vocab	<u>M</u> ake It Fun	<u>P</u>	<u>o</u>	<u>W</u> h	<u>E</u> xpand	<u>R</u>	<u>E</u> valuate	<u>D</u>
Big Buddy 1 (age 14)									
Session 1/Book 1	✓	✓			✓			✓	✓
Session 1/Book 2	√		√	✓	✓				✓
Session 2/Book 1	✓		√	✓	√	✓		✓	✓
Session 2/Book 2	✓		√		√	✓	✓	✓	✓
Big Buddy 2 (age 11)									
Session 1/Book 1	✓	✓	✓	✓	✓	✓	✓	✓	✓
Session 2/Book 1	✓		✓		✓	✓	✓		✓
Big Buddy 3 (age 8)									
Session 1/Book 1		✓	✓		✓		✓	✓	✓
Session 1/Book 2		✓	√		✓		✓	✓	
Big Buddy 4 (age 10)									
Session 1/Book 1	✓	✓	✓	✓	✓	✓		✓	✓
Session 1/Book 2		✓		✓	√				✓
Overall	70%	60%	80%	50%	100%	50%	50%	70%	90%

Table 6

Anecdotal Observations from Research Assistants

Big Buddy	Advantages	Disadvantages
Big Buddy 1 (age 15)	 More experienced reader Better at Encouraging vocabulary: explaining in a way a child would understand 	 Not as engaging Make it Fun was more difficult Didn't place book to be visible by Little Buddy
Big Buddy 2 (age 11)	 Great rapport and a can-do attitude Make it Fun was easier Great use of the Wh-questions, Distancing, and Encouraging vocabulary strategies 	Didn't place book to be visible by Little Buddy
Big Buddy 3 (age 8)	 Extroverted and bubbly personality made reading engaging and fun. Good use of Encouraging vocabulary, Distancing, and Whquestions Excellent reading skills for age 	Needed some support asking questions to predict and guide the story along
Big Buddy 4 (age 10)	Good use of <u>Prompting</u> frequently and <u>W</u> h-questions	 Less use of Make it fun Frequent skipping of vocabulary words instead of asking for assistance Didn't place book to be visible by Little Buddy

Figure 1

Reading Logs for Training (shown in panel a) and Implementation (shown in panel b) of Cross-

Age Dialogic Reading

a

Dialogic Reading Log: Big Buddy Training

- Instructions:

 For each group reading session (date):

 Under "Book #" enter a 1, 2, 3, etc., as shown in the sample. Write a brief title of the book used in training.

 Enter your initials, the number of minutes read and the last page read for your group reading session.

 In the "Child name" column, write the first name of each child in your group reading session. Then, record the strategies that the child used.

 When you finish a book, place a check (1) in the "Last pg read" column.

Date	Book	Book Title	RA	Child	# of min	Last	Check whether you used the strategy:								
	#		initials	name			<u>E</u> ncourage Vocab	M ake it Fun	<u>P</u>	0	Wh	<u>E</u> xp	<u>R</u>	<u>E</u> val	D
6/21	1	SAMPLE: Sylvester & Magic Pebble	CD		10	8									
				Child1			√	1	1	V	4	V			1
				Child2			V	1	1	1	1	1	V	1	
				Child3			V	V	1	1	1			1	1
															-
															-
															-
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															-
															-
									-						-
									_						-
															-
															-
															_

Big Buddy's Name:	Little Buddy's Name:
Big Buddy's Code:	Little Buddy's Code:

Dialogic Reading Log: Reading Buddies

- Instructions:

 For each pair reading session (date):

 Under "Book #" enter a 1, 2, 3, etc., as shown in the sample. Write a brief title of the book used in the session.

 Enter your initials, the number of minutes read and the last page read for your pair's reading session.

 Then, record the strategies that the older child used.

 When you finish a book, place a check (◀) in the "Last pg read" column.

Date	Book	Book Title	RA	# of	Last	Check whether you used the strategy:								
	#		initials	min	pg read	<u>E</u> ncourage Vocab	M ake it Fun	P	0	Wh	<u>E</u> xp	<u>R</u>	<u>E</u> val	D
6/21	1	SAMPLE: Sylvester & Magic Pebble	CD	10	8	✓	1	1	V	V	1			1
6/23	1	SAMPLE: Sylvester & Magic Pebble	CD	11	15	√	V	1	V	V	1	1	V	
6/25	1	SAMPLE: Sylvester & Magic Pebble	CD	12	1		1	1	V	1			V	1