

USING ACADEMIC COACHING TO INCREASE THE FIDELITY OF  
IMPLEMENTATION OF SPECIAL EDUCATION EDUCATORS TEACHING  
DIRECT INSTRUCTION PROGRAMS

by

KATHLEEN BENNETT

(Under the Direction of Kristin L. Sayeski)

ABSTRACT

The majority of students with disabilities have difficulty with reading. By the 4th grade, 69% of students with disabilities read at the “below basic” level (Cortiella & Horowitz, 2014). Students who struggle with reading require intensive, reading support. One evidence-based, reading intervention approach, Direct Instruction (DI), has been demonstrated in the literature as effective for teaching students with disabilities to read (Gersten, Becker, Heiry, & White, 1984; Schieffer, Marchand-Martella, Martella, Simonsen, & Waldron-Soler, 2002). DI programs follow a prescribed and highly-structured format for the delivery of reading instruction. Research on fidelity of implementation (FOI), however, has shown that when practitioners do not follow carefully structured interventions such as DI programs as prescribed, the effectiveness of the programs can be compromised. In other words, when FOI is not present, variations in the dependent variable cannot be explicitly attributed to independent variable manipulations and conclusions may not be considered valid. One strategy to increase FOI is to provide academic coaching to teachers in the classroom. Research on academic

coaching has demonstrated the capacity of directed coaching to change teacher behavior (Kretlow & Bartholomew, 2010). To date, no studies have specifically examined the efficacy of academic coaching on special educators' capacity to improve their delivery of a structured, evidence-based program such as DI reading. The purpose of the proposed study is to examine the efficacy of academic coaching on the FOI of teachers using DI reading programs. Using a sign-case design methodology, the study examined the relation between individualized, academic coaching and special educators' fidelity of implementation of DI reading.

INDEX WORDS: fidelity of implementation, academic coaching, treatment fidelity, teacher coaching, direct instruction, single subject research, Reading Mastery, Corrective Reading

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KATHLEEN BENNETT

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MA, University of West Georgia, 2011

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KATHLEEN BENNETT

Major Professor:  
Committee:

Kristin L. Sayeski  
Scott P. Ardoin  
Jennifer H. Lindstrom  
Cynthia O. Vail

Electronic Version Approved:

Suzanne Barbour  
Dean of the Graduate School  
The University of Georgia  
August 2016

## DEDICATION

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## CHAPTER 1

### INTRODUCTION

Literacy, the capacity to read and write, is a critical skill associated with greater outcomes in employment, independence, and overall quality of life (Department of Education, 2007). Reading is a skill, however, that must be taught; learning to read does not come naturally (Moats & Tolman, 2009). Reading is a process that involves many factors such as an understanding of the relation between sounds and letters and letter combinations, the capacity to assign meaning to those sounds, and an understanding of syntax that all must work together in order to aide in comprehension (Pressley, 2006). According to the U.S. Department of Education (2007), 22% of adults scored at the *Below Basic* level of reading. A “below basic” rating indicated that they were unable to read and understand commonplace prose texts, simple documents, or locate readily identifiable quantitative information to solve basic arithmetic problems. The U.S. Department of Education and the National Institute of Literacy found that 32 million people (14% of the entire population of the United States) are unable to read. As these data suggest, many students in the United States leave school without the reading skills necessary for success.

For students with identified disabilities, the percentages of students who struggle with reading are even higher (Cortiella & Horowitz, 2014). Reading achievement deficits are associated with below grade-level performance, retention, and failure to graduate (U.S. Department of Education, 2003). Goodman, Hazelkorn, Buchloz, Duffy, and Kitta

(2011) examined the graduation rates of students with high incidence disabilities (e.g., other health impairments, specific learning disabilities, mild intellectual disability, and emotional and behavioral disorders) in the state of Georgia over four years. The mean graduation rate for these students was 26.7%. The graduation rate for students without disabilities was 78.9%. Additionally, 24% of adults with reported learning disabilities scored as *below basic* on prose literacy and 38% scored *below basic* on quantitative literacy compared to 13% who scored *below basic* on prose literacy and 20% who scored *below basic* on quantitative literacy of adults without learning disabilities (U.S. DOE, 2007).

The cost of illiteracy for individuals and society is great. Forty percent of American children have difficulty reading or learning to read (Dyslexia in Children, n.d.). Eighty-five percent of all youth who are involved with the juvenile justice system are functionally illiterate (U.S. DOE, 2007). One child in four grows up not knowing how to read (UNICEF, 1999). Forty-three percent of adults at *below basic* literacy skills live in poverty compared to only four percent of adults at proficient levels of reading (UNICEF, 1999). Therefore, it is critical that reading difficulties are addressed while students are in school in order to potentially reduce the rate of illiteracy in adults.

Improving reading achievement has been a federal focus of education for K-12 students for some time. Legislation such as No Child Left Behind (NCLB, 2001) and Individuals with Disabilities Education Act (IDEA, 2004) called for the use of methods from scientifically based research in the classroom specifically to improve outcomes in reading and mathematics. NCLB ensured \$10 billion in Title 1 grants to reduce the achievement gap among students from different socioeconomic backgrounds. Even

though the overall rate of illiteracy in the United States has not changed over the past decade (U.S. Department of Education, 2007), researchers have identified specific teaching practices that consistently demonstrate strong, positive effects on students' ability to develop reading skills such as decoding, blending, and understanding of the alphabetic principle. Of these practices, Direct Instruction (DI) has consistently been identified as a highly effective evidence-based pedagogical framework for reading (Riepl, Marchand-Martella, & Martella, 2008; Schieffer et al., 2002; What Works Clearinghouse [WWC], 2007).

Created by Siegfried Engelmann in the 1960s, DI programs employ explicit, scripted, and carefully sequenced lessons to teach students to read. Explicit instruction is a critical component of effective reading instruction, especially for students with learning disabilities (Denton, Vaughn, & Fletcher, 2003; Heward, 2003; Moats, 2004). Explicit instruction includes the use of teacher directives, modeling, explanation, prompting, and corrective feedback. DI scripts include teacher presentation as well as student responses and error correction procedures (Engelmann, 2007). DI programs include ample opportunities to respond, frequent reinforcement, immediate error correction, and review of material. Because DI is so precise, it is important that the program is followed as prescribed in order to attribute student academic gains to the use of the DI program (WWC, 2007).

Fidelity of implementation (FOI) is the adherence to the instructional procedures of a program (Zvoch, 2012). Given the highly-structured nature of DI programs, FOI is of critical importance for teachers employing such programs. Research has demonstrated a link between increased gains in student achievement and greater FOI on behalf of

practitioners (Durlak & DuPre, 2008; Noell, Gresham, & Gansle, 2002; Wilder, Atwell, & Wine, 2006). Fidelity to an evidence-based practice (EBP) influences the efficacy of the practice or program (Davidson, Fields, & Yang, 2009). Durlak and DuPre (2008) found that programs implemented with fidelity yield average effect sizes two to three times higher than programs implemented without fidelity. When a teacher fails to implement an intervention as designed and does not adhere to protocols established in the evidence-based literature, valid conclusions about outcomes (i.e., its influence on student achievement) cannot be directly related to the intervention. Therefore, weak FOI may result in an EBP yielding different results than were evident under the research conditions. Conversely, when FOI is strong, students are more likely to make the academic gains previously demonstrated in the literature (Gresham, Macmillan, Beebe-Frankenberger, & Bocian et al., 2000; O'Donnell, 2008; Sanetti & Kratochwill, 2009; Zvoch, 2012).

One promising method for supporting teachers' FOI is academic coaching. There is a long history of coaching as a method of professional development. Most models of coaching involve weekly instructional sessions with the intention to increase fidelity of newly implemented instructional programs (Denton & Hashbrouk, 2009). In addition, the majority of coaching models are built around a "problem solving" approach that includes observation and feedback with the goal of improving teacher performance related to a specific task or standard (Denton & Hashbrouk, 2009). Research on coaching specifically related to the delivery of reading instruction has shown that when coaching was provided, students made greater gains in reading (Carlisle & Berebitsky, 2010; Elish-Pier & L'Allier, 2011). In addition, Kretlow and Bartholomew (2010) conducted a review of



studies that implemented coaching to increase the FOI of evidence based practices. The results of this review indicated that coaching improved FOI of evidence-based practices in classrooms and practicum settings.

When the Reading First Initiative under the No Child Left Behind legislation of 2001 was implemented, academic coaching in literacy became a frequently used means of providing assistance to teachers. Reading First (RF) included funding for reading coaches to provide training and mentoring to classroom teachers for the delivery of reading instruction. The coach was responsible for providing support to teachers that was to be embedded within the classroom and take into consideration the specific, individual needs of the teachers and their students (Steckel, 2009). The International Reading Association (IRA, 2004) identified five main requirements of a RF coach: (a) to support the teacher, (b) to provide instruction to the teacher both in and out of the classroom, (c) to have experience working with teachers to improve their skills, (d) to present at conferences and facilitate small group conversations to promote change, and (e) to have experience to observe and model in classrooms while forming trusting relationships with teachers. The goal of RF coaches was to improve teacher quality in order to facilitate high-quality instruction. According to the National Center for Education Evaluation and Regional Assistance (NCEE, 2009), although RF had no statistical significant impact on reading comprehension in grades one, two and three, results did indicate a statistically significantly increase in the amount of time spent providing instruction on the five essential components of reading.

Given the importance of effective reading instruction and the promise of reading interventions such as DI programs, a need exists to support teachers' FOI. Although

academic coaching may be an effective tool for increasing teachers' FOI, the great variation in how coaching is defined and operationalized in the literature points to the need for greater operationalization of the construct. Specifically, how a coach is defined and what the specific responsibilities of a coach are is not established (Kretlow & Bartholomew, 2010). Because of this variability in definition, there is a lack of clear directives as to which features of coaching result in the greatest changes in teacher performance.

### **Research Questions**

This study sought to answer the following questions:

1. Does academic coaching affect the fidelity of Direct Instruction reading program implementation by special education teachers?
2. If academic coaching does result in improved fidelity of Direct Instruction reading program implementation by special education teachers, are the effects maintained after coaching is withdrawn?

### **Significance of the Study**

A comprehensive review of the literature yielded limited research on (a) the specific practices employed during coaching, in general, and the coaching of reading teachers, specifically, and (b) the use of coaching to increase teachers' FOI to a highly effective evidence-based pedagogical framework for reading. Yet, a growing body of research has substantiated the importance of FOI when teachers employ evidence-based practices. DI programs have been identified as evidence-based; that is, research has demonstrated the effectiveness of the programs for teaching reading. Therefore, the purpose of this study was to examine a specific model of academic coaching designed to

facilitate teachers' FOI to specific DI reading programs. Findings from the study may be useful for administrators, special education coordinators, reading specialists, and others who support teachers' implementation of DI reading programs.

## CHAPTER 2

### REVIEW OF THE LITERATURE

Many students with disabilities have difficulty with reading. By the 4th grade, sixty-nine percent of students with disabilities have already been identified as reading at the “below basic” level (Cortiella & Horowitz, 2014). Students who struggle with reading require explicit, intensive reading support. One evidence-based, reading intervention approach, Direct Instruction (DI), has been demonstrated in the literature as effective for teaching students with disabilities to read (Gersten et al., 1984; Schieffer et al., 2002). DI programs follow a prescribed and highly-structured format for the delivery of reading instruction to students. When an intervention is not implemented as described in the literature, the effectiveness may not match the results obtained during the research-controlled conditions. In other words, when FOI is not present, variations in the dependent variable cannot be explicitly attributed to independent variable manipulations and conclusions may not be considered valid. One strategy to increase FOI is to provide academic coaching to teachers in the classroom. Research on academic coaching has demonstrated the capacity of directed coaching to change teacher behavior (Noell, Witt, Gilbertson, Rainer, & Freeland, 1997). No studies, however, have specifically examined the efficacy of academic coaching on special educators’ capacity to improve their delivery of a structured, evidence-based program such as DI reading.

## **Direct Instruction**

A key component of beginning reading is decoding. Decoding is the ability to translate printed words into sounds (Snow, Burns, & Griffin, 1998). Researchers have identified several skills necessary for efficient decoding (Snow, Burns, & Griffin, 1998). These skills include phonemic awareness (the capacity to hear and manipulate the individual sounds in spoken words), an understanding of the alphabetic principle (knowing the relation between sounds and letters and letter combinations), and blending (combining letters, sounds, or syllables). When a program specifically addresses these concepts, the program is said to employ a code-emphasis approach. Research has shown that there is a link between students' early phonemic awareness and later success in reading (Cunningham, 1990; Smith et al., 2001; Snow et al., 1998). Phonemic awareness does not come naturally to students and must be explicitly taught (National Institute of Child Health and Human Development [NICHD], 2000). The same is true for letter-sound correspondence. When letter-sound correspondence is taught explicitly, reading instruction is more efficient (NICHD, 1996). Reading Mastery is one example of a DI reading program that incorporates the above stated recommendations into their model of reading instruction (Schieffer et al., 2002).

DI reading programs are scripted curricula used with students with and without disabilities to provide developmental (foundational) or remedial reading instruction. DI reflects the explicit instruction literature (Rosenshine, 1986). That is, lessons are scaffolded to build upon what is known through efficient instruction in order for students to reach mastery. DI programs are composed of three main components that facilitate efficient and effective instruction. The components are: (a) interaction techniques to

ensure active participation; (b) organization (e.g., grouping, scheduling, and progress monitoring) to ensure instruction is matched to student need; and (c) a program design that focuses on rules, strategies, concepts, and overarching ideas taught unambiguously—with ample modeling, feedback, and practice (Watkins & Slocum, 2003). Specific DI reading programs include Corrective Reading, Reading Mastery, Funnix Reading, Horizons, and REWARDS. Designed in the 1960s, several decades of research point to the effectiveness of DI reading programs (Adams & Engelmann, 1996).

**Empirical features of DI.** Scripted programs like DI attempt to control variables that may influence student performance. If extraneous variables are minimized and key variables systematically presented, instruction becomes more efficient and effective. Engelmann and Colvin (2006) created a rubric for identifying authentic DI programs. The empirical features identified by Engelmann and Colvin (2006) are: (a) explicit presentation of information (e.g., information is clear, examples and non-examples are provided, new information is limited); (b) systematic delivery of tasks (e.g., tasks are efficient, only one correct answer is appropriate, wording is consistent, new vocabulary is included when appropriate); (c) logical provision of task chains (e.g., same type of wording used across tasks, examples cover the range of the universe of examples, application of previously taught skills); (d) brief, focused exercises (e.g., 3-12 minutes in length, test what students have been previously taught, verbal responses followed by written response); (e) logical, connected sequences (e.g., nothing is taught in isolation, later lessons expand on previous knowledge without contradictions, minimal amount of new teaching provided in every new lesson, everything taught is reviewed); (f) explicit, focused lessons (e.g., lessons include 4-10 exercises with only 10 -15% new material

addressed in each new lesson, review is provided throughout the lesson, language is consistent with previously presented material); and (g) organized, structured content presentation (e.g., lessons are grouped logically, language is simplified, and lessons progress from one concept to another, building on previously learned material).

One important strategy employed in DI curriculums is the use of a rule to explain large amounts of content. Rule-based teaching enables learners to organize the content and reduce the amount of memory required to learn. Barbash (2012) articulated several components of effective rules. First, rules should be clear. It is important that students learn the rules and conventions of reading and not “misrules.” A teacher should provide examples in a precise manner and using specific wording as to not confuse students’ conceptual understanding of a word or concept. DI programs offer lessons that are ordered in such a way that students are presented information in a specific order as to prohibit the learning of misrules—which can lead to “using but confusing” rules. For example, when teaching the color “red”, it is important to include a variety of objects that are red (e.g., apple, pen, bird, car, soda can) instead of many types of cars that are red so the student understands that “red” has nothing to do with the car but rather the color of an object. Second, instruction should be efficient. With the current instructional demands placed on teachers and an ever increasing diversity of student need to be addressed, there is clear place for efficient instruction in today’s schools—particularly when it comes to the instruction of students who are struggling or have identified disabilities (Schieffer et al., 2002; Riepl et al., 2008). DI includes features such as scripts that guide teachers’ delivery of explicit instruction and choral responding for students to maximize time on task and opportunities to respond (Barbash, 2012). Third, programs should teach to

mastery. It is important to ensure students are provided ample opportunities for correct practice to ensure long-term knowledge and/or skill retention. DI is designed with tasks presented in a logical order with ample time for practice. Each lesson includes, at most, 15% new material; eighty-five percent of each lesson is a review of previously taught concepts. Additionally, concepts are presented across lessons for maximum exposure and opportunity to practice. Error corrections are immediate and re-teaching is done when students do not meet mastery criteria (Barbash, 2012; Adams & Engelmann, 1996).

Barbash's final two components of effective instruction are (a) to celebrate success and (b) beware of intuition. It is important to encourage students as they work. Providing affirmative feedback helps students feel successful and encouraged (Ames & Archer, 1988). DI programs are designed to celebrate success multiple times during an instructional period. DI programs systematically incorporate positive feedback with specific features such as tasks that are designed for mastery, activities that permit high rates of correct responses, academic games that encourage students to perform their best, and charts that track student progress. In addition, DI programs systematically assess student achievement to ensure students know what they have learned and are not just guessing based upon a self-created rule (i.e., "using student intuition"). Thus, ongoing, formative assessments of student progress are built into the programs and teachers are not required to rely on what they *perceive* as student success and understanding. The use of these formative assessments reduces teacher reliance on self-perception of student progress and supplies unbiased assessment data. DI follows these suggested rules in order to make learning efficient for all students. Research shows that DI, and its rules and empirical features, is an evidence-based pedagogical framework effective for reading



supplementation and instruction. (Engelmann & Colvin, 2006; Przychodzin-Haviz et al., 2005; Schieffer et al., 2002).

**Research on DI programs.** Research on DI programs has demonstrated their effectiveness across a range of learners. All DI programs were field-tested with students prior to publication. Specifically, however, DI programs have been successful in addressing the reading needs of students with disabilities across different ages (Schieffer et al., 2002). The gains students made from independent research using DI reading programs include increased overall reading ability, comprehension, oral reading skills, word recognition, and fluency.

In one example, Przychodzin-Haviz et al. (2005) conducted a comprehensive review of DI reading programs. Twenty-eight studies were included in their analysis. Thirteen of the studies included students with identified disabilities. Across these 13 studies, results indicated that participants receiving Corrective Reading instruction outperformed control groups across a variety of assessments (i.e., criterion-references assessments, fluency assessments, and norm-referenced assessments). Similarly, Adams and Engelmann (1996) conducted a meta-analysis of studies that included Reading Mastery and other DI reading programs. Of the 34 studies analyzed, 80% of the results indicated that DI instruction provided greater results than the comparison groups.

In another review, Schieffer et al. (2002) examined general research outcomes as well as the efficacy of specific components of the Reading Mastery program. Twenty-five studies were included in the review. Seventeen of the studies included students without disabilities who were receiving remedial reading support or students with identified disabilities receiving special education services for reading. Nine studies

indicated that students receiving DI outperformed control groups and made greater gains. Two studies with special education populations indicated that DI was as effective as another reading program (i.e., *Basal Readers* and *Rebus Reading Systems*). Six studies indicated mixed results—that is, meaningful differences in outcomes were not indicated by the study results. Schieffer et al.’s (2002) review indicates that in the majority of studies, DI reading programs outperformed other programs, but in comparison to other, explicit programs, equivalent results were produced. The findings also indicate that DI reading programs were not universally effective with students with disabilities. Forty-four percent of the studies favored DI, whereas 33% favored other programs. The results of these studies indicate that although DI programs appear to have a positive effect on reading, the effects are not universal and may point to extenuating factors that could influence the efficacy of DI programs for students with disabilities.

In 1995, Marston, Deno, Kim, Diment, and Rogers compared special education student achievement data across six evidence-based practices (e.g., peer tutoring, reciprocal teaching, computer-aided instruction, effective teaching principles, and DI). Results from their study indicated that mean student gains were greatest for the DI and computer-assisted groups. Additionally, students in the DI group were more engaged during instruction. A one-way ANOVA was conducted to examine the between-group differences. For their study, Marston et al. (1995) used the *Code for Instructional Structure and Student Academic Responding* (CISSAR) variables (e.g., writing, task participation, reading aloud, reading silently, talk academic, attention, task management, and competing responses) to evaluate differences. All CISSAR variables were statistically significant except for the variable “competing responses,” which were

defined as behaviors that are considered inappropriate in a classroom setting (e.g., talking out, hitting). Therefore, the DI programs, along with computer assisted models of instruction, resulted in greater student achievement gains and increased engagement variables.

O'Connor, Jenkins, Cole, and Mills (1992) compared Reading Mastery with the Superkids reading program on students' overall achievement and specifically on reading achievement. Data collected for the study spanned four years. Each year, kindergarten students were assigned to one of two groups—Reading Mastery or Superkids. The students would each receive small group (2-4 students in each group) instruction for 30 minutes five days per week for the entire school year. At the end of four years, analysis of the participants ( $n = 81$ ) indicated no significant differences in overall student achievement between the two groups. However, because students were grouped in small, homogenous groups, some student groups completed far more lessons in their respective curricula—Reading Mastery or Superkids than other groups. When students in each subgroup were split into “advanced progress” (i.e., more lessons covered) and “limited progress” (i.e., fewer lessons covered) groups based on how far they got in the programs, students in the “advanced progress” subgroup of DI outperformed the “limited progress” DI group on the California Achievement Test (CAT) in the areas of total reading, visual recognition, and comprehension and on the Test of Early Reading (TERA). The two subgroups of Superkids showed no significant differences on any reading measure. Thus, DI proved to be an effective method of instruction for students with disabilities but due to the lack of overall significant differences between the DI group and the Superkids DI was

not found to be the superior, synthetic phonics method of instruction for students with disabilities.

Finally, a collection of reports from What Works Clearinghouse (WWC) repeatedly finds “potentially positive effects” or “no discernable effects” for DI. Specifically, for Reading Mastery potentially positive effects were found for English language learners in the area of reading achievement (WWC, 2012). Potentially positive effects were also found in reading fluency for adolescent literacy but had no discernable effects for the same group in reading comprehension (WWC, 2010a). For students with disabilities, the WWC indicates that DI (Reading Mastery) has no discernable effects on alphabetics and reading comprehension (WWC, 2012). Corrective Reading, however, was shown to demonstrate potentially positive effects for beginning readers in fluency and alphabetics, but not discernable effects in reading comprehension (WWC, 2007). Additionally, Corrective Reading demonstrated no discernable effects on fluency, alphabetics, or reading comprehension in adolescent literacy (WWC, 2010b). According to these studies that have been accepted for review by WWC and its criteria for “rigor of research evidence,” DI demonstrates only small and potentially positive results in students.

Although these modest and qualified findings from the WWC raise important questions about power and efficacy of DI reading programs, other reports (e.g., Stockard, 2013) point to favorable outcomes published in over 200 studies on DI programs. Clearly future research is needed that adheres to the WWC’s inclusionary standards and quality indicators in order to make more robust claims about the efficacy of DI reading programs.

Given the standardized nature of DI programs, variation in implementation can occur due to lack of training, poor adherence to procedures, failure to follow the program as recommended in terms of inclusion of all components or frequency of delivery, and lack in skillful delivery of lessons and lesson components. With this variation of implementation, valid conclusions cannot be drawn about student progress and the use of DI programs. Research on fidelity of implementation has demonstrated an important link between accurate delivery and student outcomes.

### **Fidelity of Implementation**

Even though evidence-based practices in reading have been identified (Allington, 2001; National Institute of Child Health and Human Development, 2000), great variation in implementation of these practices exist. One possible reason for the gap between research on the efficacy of DI programs and the successful implementation of DI in the schools is lack of fidelity of implementation. Until the 1970s, FOI was not commonly included in studies because it was assumed teachers would automatically implement an intervention as intended (Rogers, 2003). As teacher and school accountability for student learning outcomes has increased, interest in the implementation of interventions has increased as well (U.S. DOE, 2003). More recently, FOI is rarely reported in studies involving P-12 students and intervention programs (O'Donnell, 2008). When FOI is not taken into account, the internal validity may be compromised because extraneous factors cannot be ruled out as influencing the dependent variable (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001). Additionally, a few empirical investigations have shown that after initial instruction on implementing evidence-based methods, additional professional

development is needed to reach and maintain high levels of FOI (Buzhardt, Greenwood, Abbott, & Tapia, 2007; Foorman & Schatsneider, 2003).

Studies have shown that when FOI increases, students make greater academic gains (Davidson et al., 2009; Zvoch, 2012). When an intervention is not implemented in the classroom as described in the literature, the outcomes may not be the same as were demonstrated in the research. One of the principal factors influencing FOI is the presence of an observable and measurable definition of the independent variable. In order to assess FOI, measurement must be accurate. In order to establish accuracy, behaviors must be defined in observable and measurable terms prior to implementation. Once defined, the accuracy of FOI can be assessed by noting the occurrence of nonoccurrence of the behaviors. Measuring FOI is complex due to the lack of consensus around a clear definition of the construct. A review of the literature by O'Donnell (2008) yielded over 120 references of definitions and conceptualizations of FOI. In school settings, fidelity typically references adherence/integrity.

Additional influences on increased levels of FOI include several factors such as access to resources, time, and administrative support. Conversely, a variety of reasons contribute to a reduction in FOI. These include insufficient teacher training, predisposition to a different intervention, or the idea that modification of the intervention will demonstrate better outcome measures in students than the original intervention (Harn, Parisi, & Stoolmiller, 2013).

FOI studies typically fall under the categories efficacy studies or effectiveness studies (O'Donnell, 2008). Efficacy studies focus on to what degree an intervention is implemented as prescribed. Effectiveness studies focus on measuring FOI and how it

relates to student achievement. In order to promote FOI, various strategies should be implemented. These include training/modeling, direct observation, performance feedback, and the use of manuals (Connell, 2010; Moncher & Prinz, 1991; Sanetti & Kratochwill, 2009). According to Moncher and Prinz (1991), ongoing supervision and manuals are two of the most frequently used strategies to increase FOI.

Performance feedback is a strategy to increase FOI that is supported by a systematic line of research in educational settings (Coddington, Livanis, Pace, & Vaca, 2008; Noell et al., 2005). This feedback, including both a visual representation of FOI data and specific recommendations to increase FOI, is one approach that has potential to aid in increasing FOI in educational settings. When implementing performance feedback, the teacher's performance as a whole, including FOI, is reviewed. Additionally, there is evidence that direct training techniques including modeling and rehearsal may also promote increased FOI in educational settings and may be included with performance feedback (Sterling-Turner, Watson, & Moore, 2002).

**Research on fidelity of implementation.** A study conducted by Benner, Nelson, Stage, and Ralson (2011) specifically examined teachers' FOI to a DI program. In their study, the effect of FOI and quality of delivery on student outcomes using the DI program *Corrective Reading: Decoding* intervention was examined. Over the course of year school year, a total of 281 middle school students across three schools received the intervention from certified teachers who attended a 1-day professional development workshop on *Corrective Reading*. During the intervention, a checklist with a 5-point Likert scale was used to monitor FOI. Overall treatment fidelity accounted for 22% of basic reading skills and 18% of comprehension skills, as demonstrated on the Woodcock-

Johnson III Basic Reading Skills cluster and Passage Comprehension subtest and were statistically significant. Adherence to “following the lesson format” and “re-teaching” were the two components of FOI that had the greatest impact on student outcomes. In summary, this study furthered the research on extent to which the fidelity of implementation influences student outcomes and supported the notion that FOI to a scripted DI program is key.

A study conducted by Davidson et al. (2009) examined the FOI of a technology-based literacy intervention plus standard district instruction with standard district instruction alone. FOI data was collected using a checklist. No main effects were attributed to FOI. That is, there were not any statistically significant differences between the control group and the experimental group in student outcomes related to the majority of assessed areas (i.e., letter naming, passage comprehension, receptive vocabulary). However, classrooms with high-FOI outperformed low-FOI classrooms on key phonological awareness components (i.e., rhyming, blending). Findings from this study indicate that program adherence to the phonological awareness and alphabet knowledge components were instrumental to gains in student performance.

Noell et al., (1997) conducted a FOI study investigating a performance feedback component. A multiple baseline across three participants design was implemented to calculate the relationship between FOI and performance feedback. Performance feedback included a meeting with the teacher each morning for 3 to 5 minutes and presenting student academic performance data and teacher FOI data to the teacher. Initially, participants demonstrated high levels of FOI, but FOI quickly decreased over the course of baseline observations. When performance feedback was added during intervention, FOI



increased across participants from pretreatment ( $M = 57.6$ ) to the performance feedback phase ( $M = 72$ ). One individual failed to make progress, but it was noted this participant was absent often. Based on the results of this study, providing teachers with performance feedback increases FOI in the classroom.

These examples of research demonstrate the potential of FOI for (a) increasing student outcomes associated with intervention or curriculum delivery and (b) changing teacher behavior by providing performance feedback related to FOI. FOI can be increased through the following: (a) appropriate training, (b) development of skill in implementation, (c) performance feedback, (d) adherence to instructional procedures, and (e) the appropriate modeling of strategies in the classroom (The IRIS Center for Training Enhancements, 2010). Once a strategy to monitor and improve has been identified, it is important to incorporate a measurement tool that encompasses the described definition of FOI in a particular study.

**FOI measurement.** Sensitive and suitable FOI measurement is a challenge in intervention research (Noell, 2008). Each method of data collection has benefits and limitations. Due to the limitations, not all methods of FOI data collection offer the same reliability or usefulness (Moncher & Prinz, 1991). Some methods are time and labor intensive while others are subjective and require inferences. Thus, it may be difficult to fully assess FOI data using only one measurement tool.

Quantification of FOI data is feasible via several techniques (Gresham et al., 2000; Sheridan, Swanger-Gange, Welch, Kown, & Garbacz, 2009). These include self-reports, direct observations, interviews, audio recordings, video recordings, and permanent products. Two of the most common procedures used to measure FOI are

observations and self-reports. When assessed by experts, FOI is measured using record review or direct observations. When participants are assessing FOI, self-reports and checklists are common. More recently, a literature review by Ledford and Wolery (2013) examined the reporting practices of SCD studies over the past 40 years in 14 prominent special education journals. According to the review, the three most common procedures for collecting FOI data are direct counts (40%), checklists (27%), and self-reports (3%). It should also be noted that in 32% of the 566 studies included, the measurement system was not explicitly named.

According to Sanetti and Kratochwill (2009), the development of FOI assessment tools with adequate psychometric characteristics has been minimal. Self-reports of events do not always accurately account for all behaviors. This is due in part to errors in memory and/or varied interpretations of behaviors. When a teacher self-reports their actions, it may be assumed that they interpret the behavior similarly to the researcher. Several studies indicate that when using the self-report method of collecting FOI data, teachers overestimate their level of FOI (Noell et al., 2005, Wickstrom, Jones, LaFleur, & Witt, 1998). More recently, Hagermoser-Sanetti, and Kratochwill (2009) reported that when self-reports are conducted daily, accuracy increases.

Direct observation of FOI necessitates observations to be conducted across time and participants (Sanetti et al., 2009). To assess FOI via direct observation requires training an individual to collect data during an intervention (Sheridan et al., 2009). This requires all behaviors to be defined in observable and measurable terms to reduce inference. The use of direct observation may not be practical in school settings due to the need of additional resources and individuals to conduct the observations (Sheridan et al.,

2009). Additionally, direct observations may increase participant reactivity and may not accurately represent FOI data.

Permanent products assess FOI via tangible proof produced on intervention records. These include audio/video recordings, worksheets, charts, etc. They are typically completed daily and provide physical evidence that may be measured for fidelity.

Benefits of permanent products include the ability to assess multiple instances of an intervention with minimal reactivity by participants (Sanetti & Kratochwill, 2008).

However, not all interventions lend themselves to permanent product assessment (Sheridan et al., 2009). Depending on the intervention, it may be impossible to capture some components in a permanent product record (e.g.- behavioral compliance' social responses).

Fidelity of implementation is important for a number of reasons. Most importantly, when fidelity is high, treatment effects are better understood. When FOI is high, treatment effects are not threatened with alternative explanations and threats to internal validity are minimized. Measuring FOI can be conducted in a variety of ways, depending on the variable being measured and resources. When FOI is low, one potential promising manner to address FOI is through academic coaching.

### **Academic Coaching in Schools**

For teachers, professional development is conceivably one of the most important connections from research to classroom implementation. An assortment of approaches have been promoted to increase teachers' use of evidence based teaching methods. One of the most common forms of professional development is the one-day workshop model (Yoon, Duncan, Lee, Searloss, & Shapely, 2007). This model has limited follow-up after

initial training and does not support change in teacher behavior (Yoon et al., 2007).

Kretlow, Cooke, and Wood (2012) found that after initial training teachers' use of evidence based practices increased, but FOI was not consistently stable until after teachers received coaching. In a study by Kretlow et al. (2012), teachers reported that due to the little training they received on the evidence based practices to be used in their classrooms, they only implemented the components that worked for them. One strategy to increase FOI is to provide teachers with on-going follow-up feedback and support. An effective form of this support is coaching (Peck, Killen & Baumgart, 1989).

Dating back to as early as the 1930s, academic coaches for reading have been referred to as "learning specialists," "literacy facilitators," "language arts specialists," "language arts coaches," "curriculum specialists," "instructional specialists," "instructional coaches," and "academic facilitators" (Mraz, Algozzine & Watson, 2009). All of these titles referred to a person whose main goal was to assist teachers to improve students' reading and writing skills.

In the 1960s, under the Elementary and Secondary Education Act (ESEA) funding under Title I was provided to high-poverty schools with one of the goals being to improve reading. Today's focus on reading improvement can be traced to the Elementary and Secondary Education Act (ESEA). The allocation of separate funding under ESEA for specialists to supplement reading instruction highlighted the need for teachers to deliver specialized instruction to students who were struggling in reading.

Later, during the 1980s, coaching became a further popularized method of professional development. Coaching was initially conceptualized to be conducted among peer teachers as an alternate method of professional development to group staff

development. According to Joyce and Showers (1980), coaching is most effective when two conditions are present—“...modeling, practice under simulated conditions, and practice in the classroom, combined with feedback” (p. 384). Their conceptualization of coaching was to stimulate feedback by promoting active discussion between the teacher and coach, analyze instruction and application in the classroom by discussing teacher performance, promote instructional modifications based on student needs by evaluating individual student performance, and facilitate the implementation of new practices by collaborating on ideas and strategies to implement a new intervention. Their idea was that peer coaching, in particular, would be a means for teachers to support one another as a means of increasing faculty cooperation and shared decision-making. For example, when a teacher implements an evidence based practice and receives positive reinforcement from a coach (e.g., “Yes, you did use specific praise and provide immediate feedback during the lesson.”), the probability of the teacher providing specific praise and immediate feedback will likely increase. Contrarily, if the teacher incorrectly implements an evidence-based practice, the coach can model correct implementation and then observe the teacher attempting correct implementation. Once implemented correctly, the coach provides positive reinforcement, thus increasing the probability of correct implementation in the future.

Coaching gained greater popularity through the Reading First (RF) Initiative. RF emphasized the goal of NCLB to implement evidence-based practices in early reading instruction. Through RF, states and districts received financial support to support students’ learning to read by the end of third grade—a goal of NCLB. RF included funding for reading coaches to provide training and mentoring to classroom teachers.

Coaching was to be embedded within the classroom and take into consideration the specific, individual needs of the teachers and their students (Steckel, 2009).

Over the past decade, specific models of academic coaching have been identified. These include: (a) the technical coaching model, which focuses on implementation and improving specific instructional practices; (b) the problem-solving coaching model, which focuses on improving student outcomes and preventing future issues; (c) the reflective practice coaching model, which focuses on improving instruction and increasing teacher self-reflection and autonomy, and (d) the team building coaching model, which focuses on implementation of instructional innovations and transferring professional development learning into active classroom practice (American Institutes for Research [AIR], 2005; Denton & Hasbrouk, 2009). Denton and Hasbrouk (2009) also described types of coaches. These include: (a) student-oriented coaches who prioritize administering assessments to students themselves rather than overseeing teacher administration, and provide intervention directly to struggling readers; (b) data-oriented, coaches who prioritize spending time on activities related to assessment of students, data management, and using and interpreting data; (c) managerial coaches, who prioritize most time to planning for meetings and completing paperwork; and (d) teacher-oriented coaches, who prioritize spending a majority of their time engaging in traditional coaching activities with teachers. Thus, a taxonomy of coaching and types of coaches exist in the literature and schools resulting in differences in how coaching is conceptualized and implemented.

Standard models of coaching involve two key phases: (a) an observation of instruction and (b) the provision of feedback about the observed lesson (Yopp et al.,

2011). Feedback can include visual representation of data, modeling, rehearsal, reflection, and/or detailed directives (Yopp et al., 2011). During feedback, focus may be on setting goals to increase FOI (Noell et al., 2005). There is no one single model of coaching used in classrooms. Research has examined how various models and phases have been implemented and the outcomes of the implementation.

Research on coaching has identified both benefits and limitations of its use. According to Hooker (2013), benefits include increased cooperative learning among teachers with peer-to-peer coaching, additional instructional support, added problem solving opportunities, improved student success, and the potential for reduced financial burdens during implementation (specific to peer coaching). Conversely, limitations challenge the implementation of coaching. One of the greatest hindrances to the effective implementation of coaching is time. Finding the additional time required to actively participate in ongoing academic coaching can be a problem for many teachers (Kohler, Ezell, & Paluselli, 1999). Schedules are already dense and demands from administration are high. Additionally, when teachers hold different educational philosophies, working together may prove to be difficult (Poglinco et al., 2003).

**Types of coaching.** Various professional development practices are referred to as “coaching.” These include “technical coaching,” “peer coaching”, “team coaching,” and “cognitive coaching” (Garmston, 1987). Ackland (1991) discussed two distinct types of peer coaching, expert coaching and reciprocal coaching. Expert coaching involves a person with recognized expertise providing feedback to another individual. Reciprocal coaching involves two teachers observing one another and providing feedback to each other in order to learn from one another and jointly improve both teachers’ skills. A more

specific type of expert coaching, technical coaching, is when the focus of coaching is to effectively implement new strategies and/or to implement a program or intervention with fidelity (Poglinco et al., 2003.) The ultimate goal of technical coaching is to enhance a teacher's range of instructional skills to ensure FOI is high (Denton & Hasbrouk, 2009). According to the AIR, the technical coaching model is an "expert" providing coaching to a "novice" (AIR, 2005). Feiman-Nemser and Rosaen (1997) call technical coaching "a cyclical process designed as an extension of training" (p.25). Technical coaching seeks to extend support on training that has been previously provided to teachers. It provides teachers the opportunity to explore the rationale of a new strategy, view demonstrations, practice implementing the new strategy, and receive feedback about strategy implementation. When employing the technical coaching model, teachers and coaches collaborate to increase effective implementation and to bridge the gap from professional development to classroom implementation. Technical coaching helps teachers increase their ability to use a program effectively.

A coach using the technical model begins by reviewing the teacher's behavior against an "expert model" and noting any differences in performance (AIR, 2005). Once a teacher begins to master the strategy, focus changes from teacher performance to appropriate use of the strategy. During this, the coach instructs the teacher on how to analyze student performance and the curriculum in order to design lessons around the strategy to increase student performance. During this, the coach observes the teacher and provides feedback. For this study, the technical coaching model of academic coaching will be employed.



**Research on coaching.** In a two-part study, Peck et al. (1989) evaluated a consultation strategy for increasing systematic prompting by teachers related to objectives on students' Individualized Education Programs (IEPs). A multiple baseline across participants design was implemented. Teachers were directly observed by a consultant and video-recorded during instruction (10-15 minutes) to use during the coaching sessions. After the observation, the teacher and consultant met, viewed the recording, and the consultant informed the teacher of the specific IEP objective that would be monitored during the study in an expert model coaching session. During the coaching sessions, the coach asked the teacher probing questions as to when she (the teacher) thought she may be able to address the IEP goal. The teacher then identified prompts (e.g., verbal prompts, gestures, physical prompts) she could embed during instruction to address the IEP objective. During the following observation session, the teacher was again recorded providing instruction with the use of the previously identified prompts and the facilitator and teacher met to discuss implementation of the prompts, reviewing the video from the most recent observation session. This cycle continued for seven weeks. The results of the initial study showed that all teacher participants increased their use of systematic prompts following the coaching sessions. In addition, the students displayed increases on their identified IEP goals

A follow-up study was conducted to extend the results of the initial study (Peck et al., 1989). The differences from the first study were: (a) the video component was replaced with verbal review and (b) an existing staff member was used to implement the coaching (peer model). The baseline condition of this study mirrored the initial study. During coaching, a special education teacher met with the general education teachers and

guided discussion on identifying prompts to increase student responses towards IEP objectives. Results from this follow-up study rendered similar results as the initial study—both teacher behavior and student behavior increased. Thus, coaching on strategies to increase students' responses towards IEP objectives increased teacher and student behavior in both the expert and peer models.

Neuman and Cunningham (2009) examined the effect of coaching and professional development on literacy practices. Three groups were included in their study: (a) a control group, (b) a professional development (PD) group, and (c) a group that received PD and coaching (expert model). Professional development included a 45-hour, 3-credit literacy course conducted at a local community college site taught by experienced early childhood faculty members. The content of the course included: (a) oral language comprehension, (b) phonological awareness, (c) letter knowledge and the alphabetic principle, (d) print convention, (e) strategies for working with second-language learners, (f) literacy assessments, (g) parental role in early language and literacy development, and (h) linkages between literacy and other curriculum components. Coaching was conducted weekly in a one-on-one setting over the course of a year. Coaching included teacher reflection and goal-setting. During coaching sessions, the coach and teacher would collaboratively design a plan of action for implementing new interventions as well as evaluate and discuss prior performance. Coaches were required to log their visits with teachers and complete a reflection form daily. The group that received a combination of coaching and professional development demonstrated greater gains in teacher knowledge and greater changes in literacy practices. Data on effect sizes indicated statistically significant differences between the groups existed (professional

development  $d = .23$ , professional development plus coaching  $d = .77$ ). An effect size of 0.20 or less is considered a “small” effect size, whereas an effect size of 0.8 or greater is considered a large effect size and indicates practical significance. (McGraw & Wong, 1993). In this study, the .77 effect size for the PD and coaching condition was considered of practical significance indicating that combined with PD, coaching helped teachers increase performance in the classroom.

Similarly, Carlisle and Berebitsky (2010) compared two conditions of professional development (with and without literacy coach support) on student outcomes in phonics. Fifty-four teachers were included in the study. Participants were assigned to the coach (expert model) or no coach condition. Over the course of two years, teachers met with a coach whose job it was to provide assistance in content delivery and provide support in understanding the use of evidence-based practices during weekly grade-level meetings and assistance in the classroom. Findings from the study demonstrated that the coached group of teachers provided more small group instruction and less whole class instruction when compared to the non-coached teachers. In addition, students reading skills were assessed using the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS)*. Students labeled “at risk” on the DIBELS assessment in the coaching group were compared to students with the same distinction in the no-coaching group. Results indicated that more students moved to “low-risk” or “some-risk” categories when teachers received coaching compared with students’ whose teachers did not receive coaching. Conclusions from the study indicate that coaching had a modest effect on student achievement and a direct effect on teaching type (i.e., use of small-group or whole class instructional formats).

Walpole, McKenna, Uribe-Zarain, and Lamitina (2010) examined the relation between coaching and instruction in primary grades (K-3) in 116 schools. Participants included 123 coaches and 2,108 teachers. Likert-scale observation protocols were created to measure implementation. The protocols for teachers included items measuring: (a) collaboration, (b) small-group work, (c) effective reading instruction, (d) read-alouds, and (e) assessment. The coaching observation protocols assessed: (a) collaboration, (b) coaching for differentiation, and (c) management. The relation between the coaching protocols and teaching protocols was measured. Each protocol was a checklist composed of items deemed necessary for effective reading instruction. The protocols were used to collect data on reading instruction and coaching sessions. Coaching protocol items predicted performance on teacher protocol items in four areas (small-group work, management, effective instruction, and small-group instruction) in at least one grade level. Study results indicated that despite differences in the amount of coaching provided among schools, coaching did have a positive effect on reading instruction in the classroom.

Kretlow and Bartholomew (2010) conducted a review of studies that employed coaching to increase the FOI of evidence based practices. The evidence based practices examined included Classwide Peer Tutoring, Direct Instruction, Learning Strategies, and Positive Behavior Support. The primary dependent variable across studies was accuracy, however; the definition of accuracy varied across the studies. The review included 13 studies, a total of 3 included special education preservice teachers, and 2 included special education in-service teachers. The three preservice studies focused on the use of DI, whereas the two studies including in-service teachers focused on learning strategies. All

of the studies including special education teachers employed an expert coaching model. The results of the 5 studies including special education professionals indicated that coaching improved FOI of instructional behaviors of the teacher participants.

One specific study included in the Kretlow and Bartholomew (2010) review was Morgan, Menlove, Salzberg, and Hudson (1994). For this study, the researchers examined the effects of peer coaching on the acquisition of DI skills. Participants were preservice teachers enrolled in an undergraduate teacher education program and undergraduate peer coaches. The preservice teachers were evaluated on effective teaching behaviors in reading and spelling sessions, rate of praise statements, rate of student responses, and number of lessons mastered by students. During baseline, the data collected on effective DI teaching behaviors of preservice teachers demonstrated a range of effective DI teaching behaviors (10-60% across participants). Coaching sessions were held twice a week and included coaching on effective teaching behaviors. This coaching included evaluating videos, grading performances, individual meetings, guided self-evaluation, feedback on ineffective behaviors, and goal setting. After intervention, all participants displayed increased DI teaching behaviors (90-100% mastery) and supported the notion that coaching is an effective PD model to increase positive teaching behaviors

Bean, Draper, Hall, Vandermolen, and Zigmond (2010) examined the relation between coaching teachers and student outcomes. Twenty coaches participated in the study and tracked and recorded their activities for 3 weeks. Data collection included structured interviews, phone interviews, and daily recordings of coaching activities. Upon review of the data, coaches spent most of their time (23%) working with individual teachers. Included in this time were co-teaching, observations, class visits, modeling, and

conversations with the teacher. Feedback to teachers was provided in the form of meetings and individual conversations. Meetings were typically grade level meetings or small group professional development meetings. One-on-one meetings focused on differentiation of instruction. When the school year began, students across schools performed similarly on achievement assessments. Results indicated that by the end of the year, a greater number of students at the high-level coaching schools had increased proficiency of reading on their post-assessments than students at the less-coaching schools. Based on the Terra Nova assessment administered to first and second grade students, students of teachers who received higher levels of coaching had a significantly reduced percentage of students considered “at-risk” in reading.

Whereas the findings on coaching and student achievement are mixed, the research on coaching does demonstrate the potential of academic coaching to increase FOI by changing teacher behavior (Stormont & Reinke, 2013). Research on coaching has demonstrated that effective coaching includes the components of observation, collaboration, and feedback. In 2011, Yopp et al. identified specific criteria for instructional coaching to be effective. These criteria include: (a) targeted feedback, (b) ample reflection, (c) clear communication, and (d) provision of detailed directives. When coaching includes these factors, coaching benefits may be maximized. Coach and teacher collaborate to be effective consumers of the coaching. These criteria can be included in the traditional supervisory mode of the observation and post-observation conference model of coaching.

## **Summary**

DI reading programs have been consistently identified as effective, evidence-based practices for teaching students with disabilities the fundamental skills needed to read. DI programs, however, are highly structured programs and require adherence to the script as prescribed in the teacher manuals. Scripted programs attempt to control variables that may impact student outcomes. When external variables are minimized and key elements are methodically presented, instruction becomes more systematic and practical and student outcomes may be directly linked to implementation of the DI program. High levels of FOI reduce threats to the validity of the results.

The link between increased student achievement and FOI has been demonstrated through research. In order to attribute student success to the use of a DI program, FOI of the program is critical to keep the structure of the program as prescribed. When DI is not implemented as designed and described in the literature, rational deductions about student outcomes cannot be directly associated with the use of DI. Therefore, weak FOI may result DI producing different results than were evident under experimental conditions.

Coaching as a method of professional development is discussed throughout the literature. Coaching may help increase FOI. Despite the encouraging results of coaching studies, literature on coaching is still lacking and justifies additional investigation. Specifically, general replication of coaching effects using a standardized, technical model of a “coaching” intervention was warranted. With a focus on feedback on strategy implementation, technical academic coaching can provide teachers with strategies to increase FOI of DI reading programs. Therefore, the intent of this study was to assess the

current state of special education teachers' FOI of a DI reading program and provide coaching on any missing critical components of the program resulting in an increase of FOI.



## CHAPTER 3

### METHOD

#### **Research Questions**

The research questions were: (a) Does academic coaching affect the fidelity of implementation of DI reading programs by special education teachers?; and (b) If academic coaching does result in improved fidelity of Direct Instruction reading program implementation by special education teachers, are the effects maintained after coaching is withdrawn?

#### **Participants**

**Teachers.** Participants included three Special Education teachers. Prior to data collection, the researcher obtained approval for human subjects research from the participants' school research review board and the University of Georgia Institutional Review Board. In addition, permission to conduct this study was obtained from the school district and building-level school principals. Teachers were informed of the study purpose and procedures and all teachers signed consent to participate before the study began. The initial pool of potential participants included five teachers. All potential participants were audio recorded at least four times in order to assess teachers' fidelity to the DI program. The Frequency of Direct Instruction Behaviors Observation Tool (see Appendix B) was used for initial screening and identification of study participants. Potential participants' FOI scores were higher than anticipated; the initial inclusionary criteria for the study was established at 60% FOI or less. A commonly used standard for

FOI is at least 60% (The IRIS Center for Training Enhancement, 2014). Out of the potential five teachers who agreed to participate in the study, the three teachers with the lowest average FOI scores (66%, 78%, and 81%) were selected for this study. Although these scores were slightly higher than anticipated, they were low enough to provide a demonstration of replication of effect over two occurrences. The target criterion for the study was 90% FOI of the established critical components of a DI lesson (27 out of 30 points based upon the Frequency of Direct Instruction Behaviors Observation Tool; Appendix B).

All teachers were female with Education Specialist degrees. Classroom teaching experience ranged from 11-36 years total years of teaching with 4-15 years experience teaching DI specifically. All participants were currently teaching using DI reading programs. Areas of certification included early childhood education (2), middle grades ELA and Reading (2), reading endorsement (2), and special education (3). Only one participant had received formal training in DI. This training was provided as a workshop through Northwest Georgia RESA (Regional Educational Service Agency). Direct Instruction programs that the participants had previously used or were currently using for instruction during the time of the study included: Reading Mastery, Connecting Math Concepts, Corrective Reading, and Reasoning and Writing. For the study, the programs used by participants were: Reading Mastery and Corrective Reading. See Appendix F for the Demographic Questionnaire provided to participants.

**Coach.** The primary researcher of this study served as the primary observer and coach. The primary researcher had prior training in the following Direct Instruction programs: (a) Reading Mastery, (b) Reading Mastery Plus, (c) Corrective Reading, (d)

Language for Learning, (e) Reasoning and Writing, and (f) Spelling Mastery as well as four years of teaching experience implementing DI programs. She held a Master's degree in special education and completed the study as a part of her doctoral dissertation in the area of special education. In addition, she had prior teaching experience within the target school system and was familiar with the DI programs used in the schools.

### **Setting**

The study was conducted in a school district located in northwest Georgia. The district included 389 teachers and 6,047 students attending 10 schools in grades PK-12. Approximately 20% of students were identified as students with disabilities (SWD) and/or English learners (EL). The ethnic makeup of the district was 35.4% African American, 30.2% Hispanic, 27.9% White, 3.7% Multiracial, 2.6% Asian, and 0.1% Native American. Due to the high poverty and low-income levels in the district, all schools qualified for Community Eligibility Provision, which allows 100% of the student population to receive free breakfast and lunch.

All instructional and coaching sessions occurred in resource or self-contained settings within the district. During these sessions, groups consisted of 3-5 students and the classroom teacher. Two paraprofessionals were present in the classroom with Teacher B but provided no instruction related to the study; for the other two participants, the teachers were the only adults in the classroom during the DI reading lesson. Two of the participants conducted their DI reading instruction in classrooms; the third participant conducted her DI sessions in a hallway near an entrance to the building. The building was locked, but students from other classes would pass the group during transitions. The

teacher was provided with partitions in order to reduce distractions. Coaching sessions took place in a 1:1 setting with the teacher and the coach in the teacher's classroom.

## **Materials**

**iPad mini and Voice Record Pro app.** For the study, all participants were provided an iPad mini with an audio-recording app, Voice Record Pro (Dayana Networks Ltd, 2015), installed on it. Voice Record Pro is a professional voice recorder that may be used on an iPad. This app permits recording of voice memos at unrestricted lengths. Recordings are saved in standard AAC/MP4/M4A format. Recorded files may be exported and imported to various storage options (e.g., DropBox, Google Drive, iCloud, a website). Participants used the Voice Record Pro app to record DI reading sessions during screening, baseline, intervention, maintenance, and generalization conditions. All participants were shown how to use the Voice Record Pro app during the screening phase. Instruction included how to upload audio recordings immediately following each recording session to the researcher's Dropbox account. Additionally, paper instructions for accessing the app and uploading audio recordings were attached to each iPad for the teacher to reference as needed. All participants practiced conducting a recording and uploading the audio clip prior to their first DI recording. Participants were instructed to audio record the entire duration of each target DI reading lesson.

Conducting on-site observations may not always be practical in educational settings. One alternative to conducting in-person observations is to audio record sessions and provide feedback based upon the recordings. Using audio recordings may offer several advantages over direct observations (Tessier, 2012). First, participants can record teaching sessions at any time and therefore, observations are not limited to observer

availability. Second, audio recordings serve as a permanent product of the teacher's performance and progress over time. Third, teacher behaviors may be examined repeatedly. Fourth, using an audio recorder instead of direct observation may reduce reactive effects of experimental arrangements. Fifth, without an observer present in the classroom, students may be less distracted during their instruction and thereby the audio-observation is less likely to change the nature of the instructional experience that an in-person observation may create. Therefore, audio recordings were selected for use in this study to increase flexibility of recording times, reduce reactive effects, and allow for permanent product of each session.

**Coaching Protocol (Treatment Fidelity DSOR).** The Coaching Protocol (see Appendix A) checklist was created in order to standardize coaching sessions across participants. Although coaching has been identified as an evidence-based practice to improve teacher FOI (Kretlow & Bartholomew, 2010), coaching studies rarely have provided detailed information on the specific coaching behaviors engaged in during coaching sessions. Instead, the majority of studies on coaching have provided information related to frequency (how many times per week or month), duration (length of each coaching session), or broad principles that underscore the approach to coaching (e.g., a “problem solving” approach; Denton & Hashbrouk, 2009). Therefore, one of the goals of this study was to create a standardized coaching protocol. When coaching is standardized, it may be replicated in future studies. In addition, the protocol could be used to assess treatment fidelity. Treatment fidelity is data collected on a researcher's implementation of a procedural plan during the intervention conditions (Ledford & Wolery, 2013). An optimal method for treatment fidelity data collection involves the use

of direct systematic observation and recording (DSOR). For this study, the coaching protocol was also used as a treatment fidelity DSOR.

The Coaching Protocol (Treatment Fidelity DSOR) was developed using guidance from research on coaching. The Coaching Protocol was divided into four sections: (1) *Framing Discussion*, (2) *FOI Data Review* (i.e., performance feedback; Benner et al, 2011; Coddington, et al., 2008; Neuman & Cunningham, 2009; Noell et al., 2005; Sterling-Turner et al., 2002), (3) *Model-Practice-Feedback* (Neuman & Cunningham, 2009; Sterling-Turner et al., 2002), and (4) *Establish Future Focus Area* (Neuman, & Cunningham, 2009; Noell et al., 1997; Noell et al., 2005; Peck et al., 1989). In addition, these sections were informed by Yopp et al. (2011) guidelines. According to Yopp et al. critical components of coaching include: a visual representation of performance data (i.e., a record of the observation) modeling, rehearsal, reflection, and detailed directives. Specifically, within the *Framing Discussion* section, feedback is solicited from the teacher regarding perceptions of previous lesson and guides discussion during coaching. In an article on adult learning theories, Gordon (2004) found that adult learners relate current learning to previous learning by actively participating in the learning process. Therefore, it is important to provide adults with time to process and reflect on their learning. According to Kretlow and Bartholomew (2010), the provision of specific feedback and modeling are additional critical components of coaching. When feedback is not specific, teachers may be unaware of areas of concern and have difficulty implementing a strategy successfully (Kretlow & Bartholomew, 2010). If a teacher makes errors and modeling with specific feedback is provided, it is more likely that the teacher's FOI will increase, as the teacher is likely to try and implement the strategy with

greater awareness and accuracy. Additionally, previous research has demonstrated that a "my turn-your turn" approach to error correction improves acquisition of skills for learners (Barbetta, Heron, & Heward, 1993).

Given this prior research and recommendations for coaching, the Coaching Protocol (Treatment Fidelity DSOR) was developed to include each of these elements—framing, FOI data review, model-practice-feedback, and future focus. In addition to the delineation of specific coaching behaviors and the sequence for implementing the behaviors, suggested time limits for each section were included on the checklist to ensure appropriate time was allocated to each component. For example, limited time (3-4 min) should be spent on the framing discussion whereas the greatest amount of time should be allocated to model-practice-feedback (10-11 min).

The primary researcher piloted the Coaching Protocol (Treatment Fidelity DSOR) with a teacher not affiliated with the study to determine that all components could be completed within the suggested timeframes. During the study, the primary researcher used the protocol as an agenda during each coaching session. Each coaching session was audio recorded. For treatment fidelity, a secondary observer listened to all coaching sessions and used the tool to code treatment fidelity. Treatment fidelity was calculated after each coaching session to identify any omissions in coaching prior to the next session (see Procedures section for information on treatment fidelity calculation).

**The Frequency of Direct Instruction Behaviors Observation Tool.** The observation tool used to record teachers' FOI to DI reading programs was a modified version of the Direct Instruction Fidelity Checklist developed by Benner et al. (2011). Their checklist was developed by seven DI experts, which included researchers and

experienced DI trainers. In developing the checklist, Benner et al. underwent a rigorous process to ensure content validity. In addition to expert feedback, DI teachers also vetted and provided feedback on the development of the form. The final checklist addressed what the research team determined were five essential teacher behaviors related to Corrective Reading (DI) implementation. Those five teacher behaviors were: (a) follows the lesson format, (b) uses specific praise statements and feedback, (c) monitors student responses, (d) reteaches when needed, and (e) uses established error correction procedures. Observers scored each of these behaviors using a 5-point Likert-type scale (e.g., 0 = *does not cover component at all during lesson* to 5 = *covers component well during lesson*). Given the similarity in structure of Corrective Reading with other DI programs, the checklist is applicable for use across DI programs and therefore was selected as a model for this study. In addition, the Benner et al. checklist had a relatively high interrater reliability coefficient (.87). This means that substantial agreement levels were achieved when using this checklist to evaluate FOI.

Despite its strengths, modifications were made to the Direct Instruction Fidelity Checklist in order to reduce assumptions and address limitations identified by Benner et al. (2011). Specifically, the original five teacher actions described in the Benner et al. (2011) study were broadly defined behaviors that could be further divided into specific, more objective behaviors. For example, on the Direct Instruction Fidelity Checklist the first teacher action listed is “teacher follows format outlined by reading program.” For this study, this broad behavior is more narrowly operationalized as: (a) teacher follows the script at a brisk pace, (b) teacher includes minimal insertions or omissions, (c) teacher uses individual and whole class (overt) responses at appropriate times during the lesson



and when dictated by the lesson plan, (d) teacher uses pause/punch to emphasize new or important words, phrases concepts and/or directions, and (e) teacher uses proper amount of think time for comprehension questions (5-6s) before requiring students to respond. Operational definitions of DI behaviors from Berkley et al. (2012) were used to inform the development of the behavioral indicators used in this study.

Finally, on the revised checklist designed for this study, a 3-point scale (0-2) rather than a 5-point scale was used. Although a 5-point scale has been traditionally employed within the FOI literature (e.g., Benner et al., 2011; Walpole et al., 2010), there are limitations with any scale measure. With a five-point scale. there is an increase the variance of the scores. The increase in variance provides more information and the psychometrical properties are stronger (Humphry, 2011). Furthermore, the reliability is higher and the evidences of validity based on correlations are higher. However, more choices does not mean that more information is provided as a result of the rating. When choices are increased, problems may arise because of difficulties associated with discriminating between choices, thus increasing the potential for error (Humphry, 2011; Muniz, Garcia-Cueto, & Lozano, 2005). When a scale has fewer choices, the accuracy of scoring is increased (Humphry, 2011; Muniz, Garcia-Cueto, & Lozano, 2005). Finally, a three-point scale was designed for this study as no empirical data were available to guide the development of robust operational definitions for a larger range. For example, it is not known if 11 instances of “general praise” produces reduced student outcomes when compared to 20 instances of “general praise.”

Therefore, the modified scale was created to increase accuracy of scoring. For each level of the scale, specific scoring criteria were developed. The revised checklist, the

Frequency of Direct Instruction Behaviors Observation Tool (see Appendix B), included 15 specific DI-related teacher behaviors (see Appendix C for definitions and scoring criteria for each behavior). The maximum score that could be attained on the Frequency of Direct Instruction Behaviors Observation Tool is 30. To calculate overall FOI, the total number of points was converted to a percentage out of 100.

## **Design**

Single-case design (SCD) is a research methodology that focuses on intra-subject comparisons. Thus, participants serve as their own control. SCD seeks to determine if an intervention is effective for an individual participant (Kratochwill et al., 2010). SCD is also useful in highlighting exceptions of average effects (Kratochwill, et al., 2010). That is, SCD seeks to determine if the current intervention is more effective than baseline condition. When evaluating SCD data, a visual analysis is used instead of a statistical analysis (Cooper, Heron, & Heward, 2007; Kratochwill, et al., 2010; Smith, 2012). A multiple probe across participants design was used to evaluate the effects of the coaching on teachers' fidelity of implementation. This design was chosen over a multiple baseline design because it is more practical in an educational setting as baseline data collection is not required to be continuous. Experimental control was evaluated by staggering the introduction of the independent variable across participants. It was expected that participants who have not received the treatment (i.e., coaching) would not improve their fidelity of implementation to the DI lesson.

## **Procedures**

In the following sections the procedures for pre-baseline screening, coaching intervention, data collection for all conditions, and reliability measures are provided. All

screening, data collection, maintenance, and generalization sessions were audio recorded with no direct observer present at the time.

**Pre-Baseline Screening.** Prior to baseline, all potential participants' FOI to a DI reading program was assessed in order to determine optimal candidates for the intervention. For the pre-baseline screening, potential participants ( $n = 5$ ) recorded several (4-7) of DI reading sessions. Each potential participant recorded the same group of students on different days. As noted previously, planned inclusionary criteria stated that participants below 60% FOI would be included in the study. In the initial pool of potential participants for this study, all potential participants obtained average FOI scores greater than 60%. Thus, the three participants with the lowest average FOI scores were included in the study.

**Baseline.** After completion of pre-baseline screening data collection, baseline data was collected on the three selected participants. For all participants, a minimum of three days of baseline data were collected and data must have demonstrated stability in level and trend prior to the implementation of the first coaching session (Gast, 2010). Each audio recording was conducted during the participant's scheduled DI reading time. Immediately following the lesson, participants saved the audio recording to the primary researcher's master Dropbox account. The primary researcher listened to the entire audio recording of each lesson, documenting fidelity components on the Frequency of Direct Instruction Behaviors Observation Tool. Once the baseline was stable, the participant began intervention. A stable baseline demonstrated a pattern of responding that is consistent with decelerating or no trend. While the first participant was receiving intervention, probes were collected every third day on the remaining participants. When

the participant currently participating in intervention reached mastery criteria (90%), the next participant began recording daily baseline data for three to five sessions. Once the participant currently in the intervention phase maintained mastery criteria for at least three consecutive sessions, she was moved to the maintenance phase and the next participant currently in baseline began receiving intervention. Probe data continued to be collected on the third participant every third day until the second participant reached mastery criteria. This process was repeated until all participants received intervention. Participants were evaluated on how many fidelity components they addressed during the DI lesson using the Frequency of Direct Instruction Behaviors Observation Tool. During baseline, teacher participants did not receive any feedback on their instruction.

**Coaching (Intervention Condition).** The researcher met with each participant individually during her planning time or before/after school to implement the coaching intervention every other day. All coaching sessions followed the Coaching Protocol (Appendix A). This format was developed in order to standardize the structure of each coaching session and ensure participants received the critical components of coaching (i.e., visual representation of data, modeling, rehearsal, reflection, and detailed directives; Yopp et al., 2011). The cycle of observation-coaching continued until participants reached mastery criteria (at least 90% mastery of the items on the Frequency of Direct Instruction Behaviors Observation Tool). All participants participated in at least two coaching sessions. All coaching sessions were audio recorded.

The first coaching session was provided immediately following baseline. During this coaching session, the researcher reviewed all fidelity components—both missed and observed—on the Frequency of Direct Instruction Behaviors Observation Tool and

followed the Coaching Protocol. Coaching sessions were conducted using the teacher's DI lesson plan from the most recently observed lesson for all role-play and points of discussion. The purpose of this was to increase the relevancy of the coaching. During the session, the coach provided praise for behaviors that were included during baseline (i.e., Framing Discussion). Also, the coach identified the specific behaviors the teacher had missed in the preceding lessons and discussed the importance of those behaviors (i.e., FOI Data Review). Then, the majority of the first coaching session was spent on modeling (coach serving as the model) and rehearsing (role playing) missed behaviors (i.e., Model-Practice-Feedback). During role-play, the coach assumed the role of the student. The coach addressed trends in the data—noting if specific components were habitually omitted during instruction. Any questions from the participant about components of fidelity were addressed. The coaching ended with a discussion of next steps for the teacher and scheduling of the next coaching session (i.e., Establish Focus Area). All subsequent coaching sessions after the first coaching session followed the same Coaching Protocol. During these subsequent sessions, however, only missed components were modeled by the coach. Coaching continued until mastery criteria (90%) was reached on the Frequency of Direct Instruction Behaviors Observation Tool for three consecutive sessions.

Participants were moved to the maintenance phase after three consecutive data points at 90% of fidelity or higher (27/30 behaviors) were achieved. Given the importance of FOI in the research literature, the goal of "high" (e.g., 90% or higher) FOI was established for this study (Kaderavek & Justice, 2010).

**Maintenance.** Maintenance probes were conducted weekly for at least three weeks before moving to generalization. During the maintenance phase, teachers were audio recorded weekly during the same reading-group time and with the same group of students as the experimental phase. Teachers conducted their groups “business as usual” and recorded a DI reading lesson following the exact same procedures during baseline and intervention. The Frequency of Direct Instruction Behaviors Observation Tool was used to measure FOI of these maintenance probes. No feedback was provided to teachers during this phase.

**Generalization.** Generalization of FOI was measured using the same Frequency of Direct Instruction Behaviors Observation Tool. Participants audio recorded a DI reading lesson conducted with a group of students other than the group recorded during the intervention phase. This manner of generalization data collection does not account for history or maturation but is considered superior to a pre-post assessment (Gast, 2010). This method of data collection provides additional support that behavioral changes occurred as a result of specific instruction on fidelity components.

### **Inter-Observer Agreement and Treatment Fidelity**

**Inter-Observer Agreement.** The primary researcher and an independent observer collected IOA during all phases of the study. The independent observer was a special education teacher who had taught DI for 16 years. She was not affiliated with the study or eligible to participate in the study. Percent IOA for baseline sessions, instructional sessions, maintenance sessions, and generalization probes was calculated using the point-by-point method (Ayres & Ledford, 2014). Point-by-point IOA involves comparing individual scores for each behavior on Frequency of Direct Instruction

Behaviors Observation Tool sheet as coded by the primary researcher with the independent observer's scores. IOA is calculated by dividing the number of agreements by the number of agreements plus disagreements then multiplying the resulting quotient by 100 (Ayres & Ledford, 2014).

An independent observer was trained to collect IOA data using audio recordings of DI Reading lessons. During this training, the researcher and independent observer assessed the recordings. Training continued until IOA reached at least 90% between the researcher and independent observer. When training was completed, IOA was 91.6% (range = 80-100%). See Table 1 for item-by-item analysis of FOI during training sessions.

During baseline, intervention, maintenance, and generalization conditions, the primary researcher assessed all audio recordings from all participants. The first independent observer independently assessed 17 sessions across all participants and sessions. IOA was calculated for 32% of baseline sessions, 42% of intervention sessions, 33% of maintenance sessions, and 50% of generalization sessions across all participants with an overall IOA total of 98.3%. For Teacher A, IOA was calculated for 33% of baseline sessions, 33% of intervention sessions, 20% of maintenance sessions, and 50% of generalization sessions. Overall IOA for Teacher A was 96.65%. IOA data on Teacher B were collected during 33% of baseline and maintenance sessions and 66% of intervention sessions with overall IOA of 99.2%. Teacher C had IOA data collected on 30% of baseline sessions, 33% of intervention sessions, and 100% of maintenance sessions for an overall total IOA of 94% (range = 67-100%).

Table 1  
*Training IOA*

Behavior	Training 1	Training 2	Training 3	Training 4	% IOA
Insertions/Omissions	+	+	+	+	100%
Implements turns	-	+	+	+	75%
Calls on all students	+	+	+	+	100%
Pause/Punch	+	+	+	+	100%
General Praise	+	+	+	+	100%
Specific Praise	+	+	+	+	100%
Comprehension think time	+	+	+	+	100%
Immediate feedback	-	-	+	+	50%
Behavior Management	-	+	+	+	75%
Re-teaching	+	-	+	+	75%
Error correction procedure	+	+	+	+	100%
Pace	+	+	+	+	100%
Time	+	+	+	+	100%
Tone	+	+	+	+	100%
Workbook	+	+	+	+	100%
Total % IOA	80%	86%	100%	100%	91.67%



**Treatment Fidelity.** A second independent observer collected data on treatment fidelity. He was a school psychologist not affiliated with the study other than for treatment fidelity coding. Treatment fidelity data were collected on all coaching sessions for all participants. Treatment fidelity data involved documentation of the provision of each element of the Coaching Protocol during the coaching session. The primary researcher was required to provide participants coaching on fidelity of implementation of critical components of DI Reading lessons recorded during instructional sessions. Specific researcher behaviors related to coaching sessions were monitored and percent of treatment fidelity was calculated. The second independent observer was provided copies of the Coaching Protocol and discussed it with the researcher. All components of the protocol were reviewed and any associated documents (e.g., a completed Frequency of Direct Instruction Behaviors Observation Tool used for coaching) were available for reference.

Treatment fidelity was calculated by dividing the number of observed researcher behaviors (i.e., what the researcher did during the coaching session) by the number of planned researcher behaviors (i.e., what the researcher was supposed to do during the coaching session) and multiplying by 100 (Ayres & Ledford, 2014). Overall treatment fidelity was 97.2%. During seven of the eight recordings, treatment fidelity was 100% (range = 77.7-100%). During the first coaching session with the first participant, treatment fidelity was 77.7% or seven out of nine agreements on the Coaching Protocol.

### **Social Validity**

After data collection concluded, the primary researcher administered social validity questionnaires to the participants. According to Wolf (1978), research should

address social validation in regard to goals, procedures, and effects. More specifically, social validity should seek feedback in relation to the intervention goals and outcomes, method of attaining the desired goals and outcomes, likelihood of future engagement should an opportunity arise, and perception of efficacy. When implementing an evidenced-based intervention, buy-in of the intervention can facilitate success. When teachers support an intervention, the likelihood of successful implementation of interventions increases (Stauffer, Heath, Coyne, & Ferrin, 2012). Although subjective, social validity measures examine two aspects of treatment goals: participants' social acceptability of the intervention and participants' perception of intervention importance/relevance (Foster & Mash, 1999). As social validity information is gathered using self-reported data, it is important to consider social validity data in light of this limitation (Marchant, Heath, & Miramontes, 2012). Thus, although the examination of social validity of a particular treatment is not a substitute for examining treatment efficacy, social validity can be considered in relation to the likelihood of implementation of the intervention. The social validity questionnaire developed for this study addressed participants' perception of engaging in coaching for the purpose of increasing FOI to a DI reading program. The questionnaire contained statements regarding perceived benefits of the coaching intervention. Questions were open-ended for teachers to respond. See Appendix E for a copy of the social validity questionnaire for participants.

## CHAPTER 4

### RESULTS

The purpose of this study was to examine the effect of coaching on the fidelity of implementation of Direct Instruction reading programs by special education teachers. The findings add to the existing literature on the efficacy of coaching for the purpose of fidelity of implementation (FOI). Additionally, a procedural checklist was employed to standardize the coaching process as previous research on coaching has provided limited insight as to the specific practices and behaviors used during coaching sessions. It was anticipated that by making the coaching process more explicit, the findings generated from the study would provide greater insight on a specific approach to coaching for FOI.

#### **Individual Participant Results**

Visual analysis is the most common method of data analysis with single-case designs (Kratochwill et al., 2010). Using explicit criteria defined by Franklin et al. (1997), each graph was analyzed using three principles of visual analysis: the central location of the data, the variability among the data, and trend within each group of data (when relevant). When obvious dissimilitude between conditions became apparent, the percentage of non-overlapping data (PND) was calculated. This was calculated by determining the highest score in one condition (e.g., baseline) and calculating the percentage of scores in a comparison condition (e.g., intervention) that fell above the identified score (Scruggs, Mastropieri, & Casto, 1987). PND, therefore, describes the percentage of scores in one condition (e.g., baseline) that do not overlap with the second

condition (e.g., intervention). In the literature, there are noted advantages and disadvantages of calculating PND (Scruggs et al., 1987). Advantages of PND are that it is straightforward to calculate and takes into consideration baseline variability and changes in slope. Limitations to PND include its inability to account for ceiling effects and outliers, to detect changes in slope, and to make comparisons to typical effect size calculations (Parker & Hagan-Burke, 2007; Scruggs et al., 1987). Results of this calculation, therefore, should be interpreted in light of these limitations. In particular, PND's inability to take into account linear trend should be considered through visual inspection (Byiers, Reichle, & Symons, 2012).

**Teacher A.** As shown in Figure 1, Teacher A had an average FOI score of 59.8% with a range of 53%-70%. Level stability was established by determining if at least 80% of the data points fell within 20% of the median (Gast, 2010). With a median of 58, five out of six (83.3%) baseline data points (53, 53, 57, 63, 63, and 70) fell within 20% of the median (52.2%-63.8%), demonstrating that the condition had low variability and was stable. Using the split middle method (Gast, 2010), baseline was determined to have a slight deceleration trend indicating that the teacher was able to move to intervention. As shown in Figure 1, Teacher A did not implement DI reading lessons with high fidelity. Once receiving coaching, Teacher A reached mastery criteria in a total of six lessons with three coaching sessions. Mastery criteria was established as a minimum score of 90% on the Frequency of Direct Instruction Behaviors Observation Tool across three consecutive recordings. In accordance with Kratochwill (2010), a minimum of three data points across at least three different points in time in all phases were collected to demonstrate a casual relation. Upon receiving the initial coaching session, Teacher A initially

demonstrated an immediate and upward trend as FOI increased to 80% then 90% across the next two lessons. After the second coaching session, Teacher A demonstrated slight decrease in FOI to 87%. For the following lesson, Teacher A's implementation fidelity again reached mastery criteria (97%) and was maintained for 3 consecutive lessons (97%, 90%, and 97%, respectively). This demonstrates an initial avouchment of treatment effectiveness (Cooper et al., 2007). Furthermore, the PND from baseline to intervention was 100% demonstrating the coaching intervention did positively impact the FOI (Gast, 2010). During the intervention with Teacher A, data from both Teacher B and Teacher C remained level in baseline. During maintenance, FOI for teacher A initially dropped to 83% during one lesson but, again, reached and maintained mastery level criteria across remaining maintenance lesson (93%, 100%, 93%, and 90%). For generalization, Teacher A audio recorded DI reading lessons with a different group of students and continued to maintain at least 90% FOI (93% and 90%, respectively).

It should be noted that Teacher A met mastery criteria after three coaching sessions. However, a fourth coaching session had previously been scheduled. Upon arrival to the fourth session, Teacher A was informed that she had met mastery criteria and no further coaching was required. Teacher A personally requested that the fourth coaching session, although not required, continue so that she may participate in one final session.

**Teacher B.** As shown in Figure 1, Teacher B had an average FOI score of 74.4% with a range of 63%-80%. Baseline was determined stable using the "80-20" criteria

(Gast, 2010). With a median of 77, eight out of nine (88.9%) baseline data points (63, 70, 70, 73, 77, 77, 77, 80, 83) fell within 20% of the median (range: 69.3%-84.7%)

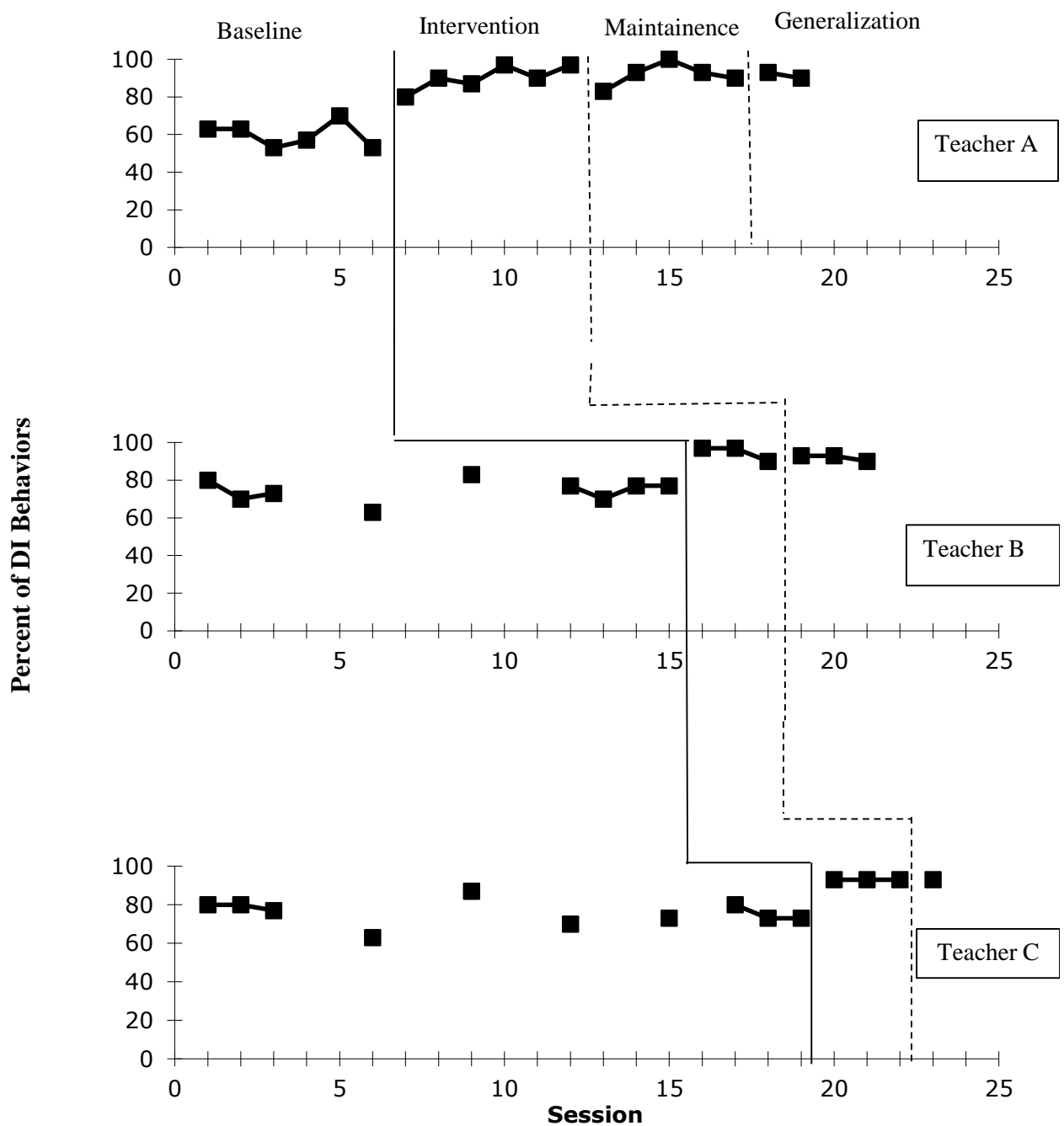


Figure 1. *Percentage of FOI behaviors displayed by teacher participants during baseline, intervention, maintenance, and generalization phase*

demonstrating that the condition had low variability and was stable. Using the split middle method (Gast, 2010), baseline was determined to have a zero celeration trend. As shown by Figure 1, Teacher B did not have consistent fidelity during DI reading lessons. After coaching began, Teacher B reached mastery criteria in a total of three lessons with two coaching sessions. Upon receiving the initial coaching session, Teacher B immediately demonstrated an upward trend as FOI increased to 97% across the next two sessions. After the second coaching session, Teacher B demonstrated slight decrease in FOI to 90%, still meeting mastery criteria for three consecutive lessons and moving to the maintenance phase. During intervention with teacher B, data from Teacher C continued to demonstrate a stable baseline. Furthermore, the PND between baseline and intervention was 100% indicating the coaching intervention did positively impact the FOI of the DI reading program. During maintenance, FOI for teacher B remained at mastery criteria for 3 sessions (93%, 93% and 90%). Due to time constraints, generalization data were not collected on Teacher B.

**Teacher C.** As shown in Figure 1, Teacher C had an average FOI baseline score of 75.6% with a range of 63%-80%. Again, baseline was determined stable using the “80-20” criteria (Gast, 2010). With a median of 75, eight out of ten (80%) baseline data points (63, 70, 73, 73, 73, 77, 80, 80, 80, 87) fell within 20% of the median (range: 67.5%-82.5%); thus, the condition had low variability and was stable. Using the split middle method (Gast, 2010), baseline was determined to have a zero celeration trend and the teacher was ready to begin intervention. As shown by Figure 1, Teacher C did not maintain consistently high fidelity levels during DI reading lessons. Once receiving coaching, Teacher C reached mastery criteria in a total of three lessons with two coaching

sessions. Upon receiving the initial coaching session, Teacher C initially demonstrated an immediate and upward trend as FOI increased to 97% across the next two sessions. After the second coaching session, Teacher C maintained 97% FOI, meeting mastery criteria for three consecutive lessons and moving to the maintenance phase. Further, the percentage of non-overlapping data points (PND) between baseline and intervention was 100% indicating the coaching intervention did positively impact FOI (Gast, 2010). During maintenance, FOI for teacher C remained at mastery criteria (97%) for one session. Due to time constraints, maintenance and generalization data were not collected on Teacher C.

### **Teacher Performance by DI Behavior Across Conditions**

IN order to plan for coaching sessions, data were examined related for each teacher, condition, and behavior (see Table 2). During baseline for Teacher A, the means of each behavior on the Frequency of Direct Instruction Behaviors Observation Tool ranged from 0.5-2.0 out of a possible range of 0.0-2.0 with an average of score of 1.19 across all behaviors. During intervention, means ranged from 1.33 to 2.0 with an average of 1.8 demonstrating a 0.71 average point increase during intervention. During baseline for teacher A, the standard deviation for each behavior ranged from 0.0-1.09. During intervention, the standard deviation ranged from 0.0-1.03.

The data also reflect the focus areas for Teacher A; coaching sessions for Teacher A focused on strategies for increasing specific praise, providing immediate feedback, and completing the lesson in the timeframe allocated by the program. In addition, coaching was also provided on increasing general praise statements, maintaining a brisk pace during instruction, and completing the workbook.



Table 2  
*Calculated Means and Standard Deviations across Participants and Conditions*

<u>Behavior</u>	Teacher A				Teacher B				Teacher C			
	<u>Baseline</u>		<u>Intervention</u>		<u>Baseline</u>		<u>Intervention</u>		<u>Baseline</u>		<u>Intervention</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Insertions/Omissions	1.57	0.82	2	0	2	0	2	0	2	0	2	0
Implements Turns	2	0	2	0	2	0	2	0	2	0	2	0
Calls on all Students	2	0	2	0	1.78	0.44	2	0	1.9	0.32	2	0
Pause/Punch	1.67	0.52	1.83	0.41	2	0	2	0	2	0	2	0
General Praise	1	1.09	2	0	0	0	1.67	0.58	1.9	0.32	2	0
Specific Praise	0	0	1.5	0.84	1.78	0.44	2	0	0	0	2	0
Comprehension Think Time	2	0	2	0	1.33	1	2	0	2	0	2	0
Immediate Feedback	0	0	1.33	1.03	1.44	0.88	2	0	1	0.67	2	0
Behavior Management	0.67	0.82	1.83	0.41	2	0	2	0	1.4	0.84	2	0
Re-teaching	1.5	0.84	2	0	1.33	0.71	2	0	1.2	0.92	2	0
Error Correction	1.67	0.52	2	0	1	0.87	2	0	1.9	0.32	2	0
Procedure												
Pace	1	0	1.83	0.41	1.67	0.5	2	0	1.5	0.53	2	0
Time	0.5	0.55	1.67	0.52	0	0	0.67	0.58	0	0	0	0
Tone	1.33	0.52	2	0	2	0	2	0	2	0	2	0

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Workbook	1	1.09	1	1.09	2	0	2	0	1.9	0.32	2	0
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During baseline for Teacher B, the means of each behavior on the Frequency of Direct Instruction Behaviors Observation Tool ranged from 0.0-2.0 out of a possible range of 0.0-2.0 with an average of score of 1.49 across all behaviors. During intervention, means ranged from 0.0 to 2.0 with an average of 1.87 demonstrating a 0.38 average point increase during intervention. During baseline for Teacher B, standard deviations for each behavior ranged from 0.0-1.0 with an average of 0.32. During intervention for Teacher B, standard deviations for each behavior ranged from 0.0-0.5 with an average of 0.08. Coaching sessions for Teacher B focused on strategies for increasing general praise statements, using a DI-specific error correction procedure, and completing the lesson in the timeframe allocated by the program. In addition, coaching was also provided on providing think time for comprehension questions and re-teaching concepts when errors occur.

During baseline for Teacher C, the means of each behavior on the Frequency of Direct Instruction Behaviors Observation Tool ranged from 0.0-2.0 points out of a possible range of 0.0-2.0 points with an average of score of 1.51 points across all behaviors. During intervention, means ranged from 0.0 to 2.0 with an average of 1.87 demonstrating a 0.36 average point increase during intervention. During baseline for teacher C, standard deviation for each behavior ranged from 0.0-0.92. During intervention, the standard deviation for all behaviors was 0 as the Teacher received a score of 2 for all behaviors except Time Allocation. For Time Allocation, the teacher consistently scored a 0. Coaching sessions for Teacher C focused on strategies for increasing specific praise, providing immediate feedback, and completing the lesson in the timeframe allocated by the program. In addition, coaching was also provided on using

a DI specific error correction procedure, maintaining a positive tone during instruction, and re-teaching concepts when errors occur.

### **Social Validity**

Upon conclusion of all data collection, all three participants were given the Social Validity Questionnaire (see Appendix E). The purpose of the questionnaire was to receive feedback on the participants' perspective of the coaching process. Six questions were included for participant feedback. The primary researcher provided each teacher with a copy of the questions to complete at their convenience. Question one and question three addressed perceptions of coaching and solicited feedback on specific aspects of coaching. All three participants responded that they felt coaching was a positive, helpful, learning experience. Some of the favored aspects of coaching included the positive feedback, professionalism, and encouragement. The only aspect that was challenging for any teacher was the fact that student behavior is unpredictable—which they attributed to differences in their FOI of the program—and recording was difficult at times.

Questions two and five addressed the influence of coaching on future behavior and personal satisfaction of the outcomes from this coaching. All three participants stated that they believe this coaching will influence their future behavior by improving their DI presentation, implementing different techniques such as increasing specific praise across all portions of the DI lesson and increasing their effectiveness of DI lesson presentation. Participants were satisfied with the results from this coaching stating that they have learned a lot, sharpened their instruction, and may see increased student learning as a result.

The last two questions focused on FOI to a DI program and whether coaching/feedback similar to this would benefit other DI teachers. Participants felt that coaching was effective at increasing adherence to the DI program and that adherence was important when providing DI lessons. They also felt other teachers using DI could benefit from similar coaching. Specifically, participants identified three possible reasons for the need for coaching. First, some teachers in their district received no initial DI training. Second, for other teachers, initial training was provided but no follow up was provided. Third, teachers have room to grow in order to best serve students using a DI program.

### **Summary**

During baseline, the mean FOI ranged from 59.8% (Teacher A) to 75.6% (Teacher C), indicating the existence of some components of FOI during a DI reading lessons; however FOI was not considered high. After receiving coaching, each participant demonstrated increased levels of FOI and met mastery criteria. Furthermore, those levels of FOI remained high during maintenance and generalization.

## CHAPTER 5

### DISCUSSION

The purpose of this study was to evaluate the effect of academic coaching on the fidelity of implementation of Direct Instruction reading programs implemented by special education teachers. With the specific focus on the provision of feedback for strategy implementation, participants in the study received “technical” academic coaching in order to increase FOI of DI reading programs. Additionally, the study sought to determine if improved fidelity to a DI reading program would be maintained after coaching was complete. During baseline, participants implemented DI reading lessons with mixed levels of FOI. For the intervention, the coaching procedures followed a standard model of coaching that included two key phases: (a) an observation of instruction and (b) the provision of feedback about the observed lesson (Yopp et al., 2011). For the technical academic coaching, the coach provided specific feedback related to program implementation (Denton & Hasbrouk, 2009; Poglinco et al., 2003). For this study, coaching consisted of meeting with participants after every other DI reading lesson for no more than 20 minutes. Participants were provided with graphed FOI data and provided specific performance feedback related to those data. After the delivery of coaching, all of the teachers demonstrated increases in FOI.

This study extended the literature base on coaching for the purpose of increasing the FOI of special education teachers implementing DI reading programs. The study supports previous research that found that coaching can be effective for increasing

teachers' FOI (Kretlow & Bartholomew, 2010; Morgan et al., 1994; Peck et al., 1989) and contributes to the coaching literature by providing a specific model of coaching operationalized for standardization and future replication. More specifically, this study extended the research of Morgan et al. (1994) by examining all components of a DI reading lesson across multiple DI programs, not just one component of one DI program. In the Morgan et al. (1994) study, the focus was on a 3-4 minute video sample of the Word Attack skill section in a Reading Mastery lesson. In addition, this study focused on current special education teachers, whereas Morgan et al. (1994) provided intervention to low-performing preservice teachers. Furthermore, the current study demonstrated that effective coaching could be provided to experienced teachers across few coaching sessions lasting no more than 20 minutes and mastery criteria could be met. Future research should explore if the efficiency of the current study was due solely to teacher experience and education level or if the use of the standardized, technical coaching model could contribute to more efficient and effective coaching outcomes for novice and preservice teachers.

This study also rendered similar results to the study conducted by Noell et al. (1997). In their study, the researchers investigated the effect of coaching on general education teachers' implementation of a reinforcement-based intervention designed to improve the academic performance of elementary-school students. Specifically, Noell et al. (1997) provided coaching with performance feedback and measured teachers FOI to the intervention. Whereas Noell et al. (1997) provided daily feedback, the current study provided bi-weekly coaching with performance feedback. When coaching was provided during intervention in Noell et al. (1997) and in the current study, FOI increased across

participants from baseline to intervention thus demonstrating that coaching was effective at increasing FOI for both groups of teachers. Again, future research can examine if differences in frequency of coaching produces differential effects.

### **Research Questions**

**Research Question #1.** The first research question for this study was: Does academic coaching affect the fidelity of implementation of Direct Instruction reading programs by special education teachers? To answer this question, a multiple probe across participants design was employed during the study. Therefore, to answer question one, data were assessed in order to determine if a functional relation was established following the systematic, staggered introduction of coaching across three participants. Data indicated that all participants' percentage of FOI increased to mastery levels ( $\geq 90\%$ ) following the introduction of coaching. Two participants reached mastery level after two coaching sessions and one participant after three coaching sessions. Teachers in the Benner et al. (2011) study, a prior research study that measured teachers' FOI to a DI reading program, had mean percentage of FOI of 74.3% (18.58 out of 25 points on the Corrective Reading Decoding Fidelity of Implementation Observation Checklist). In the Benner et al. study, students whose teachers had higher overall levels of treatment fidelity were more likely to demonstrate gains in reading achievement. Specifically, FOI accounted for 22% of the variance in gains students' basic reading skills (Benner et al., 2011). Therefore, the high levels of FOI demonstrated by teachers as a result of the standardized coaching model bodes well for student learning. Future research is needed, however, to determine if absolute levels of FOI are needed in order to produce consistent



gains. That is, would relatively high (80-90%) FOI result in a similar gains or account for a similar amount of variance in student achievement as very high (91%-100%) FOI?

As noted in Chapter 3, the FOI observation tool used for this study was based upon Benner et al.'s (2011) measure. The current measure, however, addressed several limitations identified by Benner et al. (2011). Specifically, O'Donnell (2008) identified five aspects of FOI—adherence, quality of delivery, duration, participant responsiveness, and program differentiation. The Benner et al. FOI measures assessed only two of these aspects: adherence and quality of delivery. In contrast, the FOI tool used in this study was designed to address all five aspects by adding teacher behaviors related to duration (i.e., length of session as well as individual components within each session), participant responsiveness (i.e., levels of teacher engagement in the program as measured by tone and pace), and program differentiation (i.e., the presence or absence of critical features [e.g., specific error correction procedures] of the program). In order to address these missing aspects of FOI, when creating the Frequency of Direct Instruction Behaviors Observation Tool used in the current study, the primary researcher conducted a comprehensive task analysis of DI reading program behaviors in order to identify 15 critical behaviors (in contrast to the four behaviors coded in the Benner et al.) and (b) created specific operationalized definitions for each of those DI reading program teacher behaviors.

Findings from this study also provided support for the efficiency of the Coaching Protocol for the participants in the study. For these well-educated, experienced teachers, mastery criteria ( $\geq 90\%$  FOI) was achieved after the delivery of several coaching sessions. In prior research on coaching, the frequency and total number of coaching

sessions has varied from daily coaching to one instance of coaching (Benner et al., 2011; Morgan et al., 1994; Neuman & Cunningham, 2009; Noell et al., 1997). In addition, the total duration of coaching has ranged from 5 -100 hours of coaching (Yoon et al., 2007). Although the standardized technical coaching model used within this study resulted in a particularly efficient method of professional development, as noted previously, future research is needed to explore if similar results would be found with different populations.

Finally, in exploring the effect of coaching on teachers FOI, data were collected via audio recordings for this study. Although the use of audio recordings for observational data collection has been used in previous research (Bates, Konkin, Suddards, Dobson, & Pratt, 2013; Johnson et al., 1974; Lockwood, 1992), the successful use of audio recording for the purpose of FOI data collection and coaching planning further supports this prior research. For this study, researchers were able to capture all teacher talk, and the consistency of raters' interpretation of that teacher talk was evidenced by the high IOA ratings (94%).

**Research Question #2.** The second research question was: If academic coaching does result in improved fidelity of Direct Instruction reading program implementation by special education teachers, are the effects maintained after coaching is withdrawn? All three participants recorded at least one data point once mastery criteria was met and intervention was completed. Teacher A provided the most post-intervention data ( $n = 7$  probes of weekly data). Data from weekly probes in both maintenance and generalization settings demonstrated that the effects of coaching were maintained for at least five weeks after the final coaching session for Teacher A. Teacher B provided three weeks of maintenance data. Again, she maintained mastery level FOI across three probes after her

final coaching session. Due to time limitations, Teacher C was only able to record one additional lesson during the week following coaching; mastery-level FOI (97 %) was demonstrated for this probe. In Kratochwill et al. (2010), it is recommended that each phase have a minimum of three data points to be considered an attempt to demonstrate an effect. In this study, all participants had at least three data points during each phase (baseline, intervention, maintenance) before moving to the next phase.

Based upon the data, the intervention was effective for increasing the fidelity of implementation of a Direct Instruction reading lesson for all participants. On average, teachers reached criterion within two coaching sessions, which was the equivalent of 40 minutes of coaching during one school week. Following the implementation of coaching, all teachers showed immediate increases in levels of FOI. Furthermore, 2 of 3 participants demonstrated mastery-level maintenance of FOI on post-intervention probes of up to three weeks. Finally, one participant demonstrated generalization of high levels of FOI to another DI reading group.

### **Limitations**

As with all research, it is important to note the limitations associated with study implementation. First, the external validity of the results for this one SCD study is limited (Richards, Taylor, & Ramasamy, 2013). All data examined herein were based on a target group of participants and future replications are warranted to increase the external validity of the conclusions. In addition, the findings of this study are limited to the implementation of a specific technical academic coaching model implemented with three teachers in one school district in a particular geographic location. The teachers included in the study were not representative of the general teaching population as they had

advanced degrees and many years of teaching experience. .Extending the results using a larger sample of teachers and diverse schools via systematic and direct replications is needed to replicate these findings (Birnbrauer, Peterson, & Solnick, 1974). Hence, the generalizability of the study is limited without further replications. Though the results of the intervention were positive, the results could have been shaped by the unique histories of the teachers. Specifically, all participants in this study demonstrated some pre-existing FOI behaviors; therefore, the rapid acquisition of additional FOI behaviors may have been related to those aforementioned behaviors. Despite this fact, such qualification does not invalidate that a functional relation was ascertained. In addition, although teachers' prior knowledge and skills may have contributed to the speed and efficacy of the intervention, the fact that teachers were able to increase their FOI demonstrates the potential of coaching for providing experienced teachers a “boost” of professional development, which may have meaningful impact on student achievement. Relatedly, it is important to note, that two participants had not received any initial training on implementation of a DI reading program. The third participant had received training, but that training was provided more than 20 years ago.

A second limitation of the study is that no student outcomes were measured. Given the prior research on the relation between FOI and student achievement (Allinder, Bolling, Oats, & Gagnon, 2000; Benner et al., 2011; Hall & Loucks, 1977; Penuel & Means, 2004; Songer & Gotwals, 2005; Ysseldyke, Spicuzza, Kosciolk, & Boys, 2003), the focus of this study was to examine the relation between a standardized model of technical academic coaching and teachers' FOI to DI reading programs—a highly structured and effective program. However, the collection of student data would have

provided additional insight on relation between FOI and student learning. In addition, if data on student performance had been collected as a part of this study *prior to* the implementation of coaching and student growth was high, coaching may not have been warranted. In contrast, if student growth levels were low or variable, those data could have provided additional support for the need for coaching.

Third, due to school scheduling constraints, only one participant, Teacher A, had a schedule that permitted the possibility of meeting the per-lesson time allocations specified for their respective DI programs (i.e., 30-50 minutes for each lesson). Both Teacher B and Teacher C were only permitted to schedule 20 minutes with their groups; thus it was not possible for either Teacher B or Teacher C to score a “2” on the Frequency of Direct Instruction Behaviors Observation Tool for time allocation. Teacher A was scheduled 30 minutes with students, and due to some flexibility in her schedule, could keep the group additional time as needed to complete a lesson. Although these scheduling constraints for Teacher’s B and C did not prohibit teachers from meeting mastery criteria, it should be noted that had time not been a limitation, it is likely that both participants would have achieved higher scores on the Frequency of Direct Instruction Behaviors Observation Tool. In addition, without student performance data, the practical effect of limited time could not be captured.

Fourth, due to time constraints, limited maintenance and generalization data were collected to determine if the effects of coaching were maintained once coaching was withdrawn. The limited data that were collected demonstrated that the effects were potentially maintained; however, additional systematic replication with adequate time to include all data points in all phases should be investigated to determine if FOI levels

would remain high after minimal coaching and generalize to other groups of students, programs, and/or settings. In addition, for Teacher B, a phase change was initiated to maintenance even though the final data point during intervention indicated a decrease in FOI. All data points met mastery criteria and therefore Teacher B was moved to maintenance where all data points continued to meet mastery criteria.

Finally, although careful attention was paid to the development of objective, operational definitions of specific behaviors for the Frequency of Direct Instruction Behaviors Observation Tool, several of the behaviors required multiple points of data collection (e.g., the provision of specific praise, the provision of general praise). Although frequency data were collected, when or where in the lesson those behaviors were demonstrated was not collected. For example, for “specific praise,” participants with fewer than 15 praise statements were coded a 0, teachers with 16-29 statements were coded as 1, and teachers with 30 or more were coded as 2. Similarly, data on “missed opportunities” for the demonstration of these particular behaviors could have been collected. Future research that targets specifically where these behaviors are occurring or not occurring within a DI reading lesson could provide additional data to enhance the efficacy of coaching for these specific behaviors.

### **Implications for Practice**

The results of the study have implications for professional development and practice of DI reading program implementation. First, although many studies point to the efficacy of coaching for changing teacher behavior, few studies clearly delineate the specific coaching behaviors employed with the study (e.g., Denton & Hasbrouk, 2009; Neufeld & Roper, 2003). For this study, a specific model of technical academic coaching

directly tied to performance feedback was developed and used as the intervention. As demonstrated by this study, the coaching model was implemented in 20 minutes or fewer for each coaching session. Thus, this specific and efficient model of coaching can be used by practitioners when working with teachers who are implementing DI reading programs.

Second, the first critical step to coaching is to conduct an observation (Knight, 2007). In-person observations, however, can present challenges such as interruptions to instruction, scheduling conflicts, and reactive effects of teachers (Carlson & Morrison, 2009). For this study, iPads were used to audio record all DI lessons. In this particular district (and many others), iPads are readily available for students and teachers, thus no additional technology would be required to audio record lessons and minimal training is required to use the Voice Record app. Using audio recordings minimizes the challenges associated with in-person observations and provides a permanent product or performance over time. Therefore, this study demonstrated that audio-recordings could be used to generate performance feedback data to guide the coaching process.

Third, results of this study demonstrate that mastery level of FOI could be attained after 2-3 coaching sessions. It is not uncommon for schools to provide didactic training as part of the provision of teacher professional development; however didactic training alone is not likely to produce effects (Stokes & Baer, 1977; Yoon et al., 2007). Teachers may be more receptive to one-on-one coaching as a follow up to large-group, didactic training, if they know that they will receive a clearly structured model of coaching based upon their specific needs. In addition, through periodic maintenance recordings and assessments, supervisors could monitor teacher performance and provided follow-up as needed. Finally, it may be possible that once initial coaching is complete

and mastery level is reached, teachers could monitor their own performance by periodically recording their lessons and the completing the Frequency of Direct Instruction Behaviors Observation Tool to determine if their instruction maintains high levels of FOI. This should be investigated further.

### **Implications for Future Research**

Empirical literature has demonstrated that FOI to specific academic programs can be an important component related to student outcomes, and teachers require professional development that goes beyond initial training (Buzhardt et al., 2007; Dumas et al., 2001; Foorman & Schatsneider, 2003). Academic coaching has been shown to improve FOI (Kretlow & Bartholomew, 2010; Morgan et al., 1994; Peck et al., 1989). Traditional models of coaching include two main phases: (a) an observation of instruction and (b) the provision of feedback about the observed lesson (Yopp et al., 2011); but within the academic coaching literature, there are limited studies describing the specific methodology of a coaching session. Hence, there is a demonstrated need for studies that contribute to the operationalization of academic coaching in order for coaching to be readily replicated in experiments as well as systematically implemented in educational settings. In addition, coaching may be provided in many forms (Ackland, 1991; Garmston, 1987). No one specific model is used in all academic coaching settings. Though this study demonstrated that technical academic coaching did increase FOI among experienced, special education teachers implementing a DI reading lesson, it did not compare the technical academic coaching model to other coaching models. For example, although the intervention produced demonstrations of effect, the teachers may have prefer a different model (e.g., peer coaching), which could affect the receptiveness



of the coaching among teachers and implementation of the behaviors discussed during coaching. Future research could compare models of coaching and teacher receptiveness of those models.

In addition, future researchers could investigate the use of Frequency of Direct Instruction Behaviors Observation Tool with additional DI programs for subjects other than reading (e.g., Connecting Math Concepts, Reasoning and Writing) to determine if this tool can be applicable to a variety of DI programs. Two DI reading programs were included in the current study (Reading Mastery and Corrective Reading), but additional DI programs across subjects are available for teacher and student use in the classroom. If the Frequency of Direct Instruction Behaviors Observation Tool could be applied to any available DI program, the likelihood for use in schools may increase due to the flexibility of the tool.

Further, future research could examine how long the effects of coaching can be maintained after coaching has ended. That is, how robust is this particular model of coaching and how frequently would a “booster” coaching session be required in order to maintain effects. Finally, as noted previously, future research should examine the effectiveness of the model on teachers with different levels of experience and education as well as capture student performance data in relation to this specific model of coaching. In sum, despite some limitations and a need for additional research, the results of this study provided a demonstration of effect of the use of technical academic coaching on the FOI of special education teachers using DI reading programs.

Despite various limitations and a need for ongoing research, the results of this study provided convictive evidence of the potential practicality of technical academic coaching to increase FOI of DI reading instruction.

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## APPENDIX A

### Coaching Protocol (Treatment Fidelity DSOR)

Rater Initials: \_\_\_\_\_

Date: \_\_\_\_\_

Observation #: \_\_\_\_\_

**Overview:** *Within Direct Instruction programs, critical components include: adherence to the script, frequent use of praise statements, continuous student monitoring, error correction, procedures, and re-teaching. Coaching will focus on these critical areas.*

	Observed	Not Observed
<b>Framing Discussion (3-4 minutes):</b> Coach and teacher discuss the following: a. What went well within the DI framework? b. What are 1-3 things you would like to work on related to DI? c. And are there specific things that you would like from the coach (e.g.-modeling, resources, feedback on specific student behaviors, etc.)?	a. _____ b. _____ c. _____	a. _____ b. _____ c. _____
<b>FOI Data Review (2-3 minutes)</b> Coach reviews previously collected data. This includes number of items on the checklist the teacher addressed during the lesson as well as items not included in the lesson. This may be presented as a percent or ratio. Coach addresses all 5 items on the Frequency of Direct Instruction Behaviors Observation Tool for the current lesson.		
<b>Model-Practice-Feedback (10-11 minutes).</b> The coach will have pre-determined 2-3 focus skills for the coaching session based on items missed on the checklist. Using the same script employed during the observation, the coach will model the script acting as the teacher and then reverse roles and have the teacher model the script. For example, if the teacher is not “Following the script and deviating when appropriate,” the coach will target that behavior. Similarly, if the teacher is failing to “pause and punch,” the coach will have the teacher practice with corrective feedback on how to employ that skill. <b>Structure</b> a. Model Desired Skill (Coach Leads). b. Role-Play (Teacher practices “teacher role”). c. Feedback. d. Researcher responds to any questions asked by the teacher during this time.	a. _____ b. _____ c. _____ d. _____	a. _____ b. _____ c. _____ d. _____
<b>Establish focus area for following observation (2 minutes)</b>		

## APPENDIX B

### Frequency of Direct Instruction Behaviors Observation Tool

Teacher (Code): \_\_\_\_\_ Observer: \_\_\_\_\_ Date: \_\_\_\_\_  
 Duration of Lesson: \_\_\_\_\_ DI Program: \_\_\_\_\_

Score (0, 1, 2)	Direct Instruction Behaviors	Frequency
	Makes insertions or has omissions to the script	
	Implements individual turns or whole class responses when prompted by the script	
	<ul style="list-style-type: none"> <li>Calls on <i>all</i> students during individual response portion of the lesson; record frequency of each student's response (note: for individual turns the student's name is called)</li> </ul>	
	Employs "pause and punch" technique (i.e., pauses when prompted by script to pause or signal, immediately followed a clear, strong "punch"/articulation of the example or direction)	
	Provides general praise such as "Good job," "Awesome," "We are on track today!"	
	Gives specific praise in the form of repeating students' correct response (e.g., "Yes, the word is 'ring'!")	
	[Comprehension section only] Allows 5-6 s of think time for comprehension questions before requiring students to respond	
	<b><i>Opportunity for immediate feedback</i></b>	
	<ul style="list-style-type: none"> <li>Addresses errors immediately during instruction (within 3s)</li> </ul>	
	<ul style="list-style-type: none"> <li>Fails to address errors within 3s</li> </ul>	
	<b><i>Opportunity for behavior management such as not responding on signal, shouting, off-task, refusal to respond</i></b>	
	<ul style="list-style-type: none"> <li>Employs behavior management employed such as T-S game; repeat section; individual turn; practice.</li> </ul>	
	<ul style="list-style-type: none"> <li>Fails to employ behavior management</li> </ul>	
	<b><i>Opportunity for re-teaching (i.e., a student error occurs)</i></b>	
	<ul style="list-style-type: none"> <li>Re-teaches a concept</li> </ul>	
	<ul style="list-style-type: none"> <li>Fails to re-teach a concept</li> </ul>	
	<b><i>Opportunity for specific error correction procedure</i></b>	
	<ul style="list-style-type: none"> <li>Uses DI-taught error correction procedure</li> </ul>	
	<ul style="list-style-type: none"> <li>Uses incorrect or non-DI error correction procedure</li> </ul>	
	Maintains a "brisk pace" over the course of the lesson.	
	Completes the lesson in estimated allotted time (30-45 min depending upon the program)	
	Employs an upbeat, positive tone throughout the lesson	
	Requires students to use the independent workbook	

	<b>TOTAL SCORE</b>
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## APPENDIX C

### Operational Definitions

#### *Operational Definitions Related to the Frequency of Direct Instruction Behaviors Form*

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Minimal Insertions or Omissions	<b>Definition:</b> Teachers who make few/minimal insertions and/or omissions to the program.  <b>Code:</b> <ul style="list-style-type: none"><li>• Teachers who make 3 or more insertions and/or omissions within the script will be coded as a 0 for minimal insertions or omissions.</li><li>• Teachers who make 2-3 insertions and/or omissions within the script will be coded as a 1 for minimal insertions or omissions.</li><li>• Teachers who 0-1 insertions and/or omissions within the script will be coded as a 2 for minimal insertions or omissions.</li></ul>
Individual and whole class responses when dictated by the lesson plan	<b>Definition:</b> Teachers implement individual and whole class responses during the lesson as described.  <b>Code:</b> <ul style="list-style-type: none"><li>• Teachers who implement individual turns or whole class responses 1 time or fewer will be coded as a 0.</li><li>• Teachers who implement individual turns or whole class responses 2-3 times will be coded as a 1.</li></ul>

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	<ul style="list-style-type: none"> <li>Teachers who implement individual turns or whole class responses 4 or more times will be coded as a 2</li> </ul>
Distribution of questions across participants	<p><b>Definition:</b> During opportunities for individual turns, all students are given the opportunity to respond individually.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>Teachers who fail to implement individual turns to all students during two or more opportunities for individual turns will be coded as a 0.</li> <li>Teachers who fail to implement individual turns to all students during one opportunity for individual turns will be coded as a 1.</li> <li>Teachers who implement individual turns to all students during all opportunities for individual turns will be coded as a 2.</li> </ul>
“Pause and Punch”	<p><b>Definition:</b> The phrase “pause and punch” is a DI term used during training. Teachers are taught to “pause” and “punch,” which is defined as the purposeful use of pauses and emphasis of key words. For example, “Listen, I’ll say the sounds in [pause] day: /d/ /a/.” The pause serves as a cue and what follows is clearly articulated.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>Teachers will be coded a 0 if the teacher fails to implement “pause” and “punch” on 4 or more opportunities</li> <li>Teachers will be coded a 1 if the teacher fails to implement “pause” and “punch” on 2-3 opportunities.</li> </ul>

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	<ul style="list-style-type: none"> <li>Teachers will be coded a 2 if the teacher fails to implement “pause” and “punch” on 0-1 opportunities.</li> </ul>
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General Praise	<p><b>Definition:</b> When a teacher provides general praise such as “Good job, “ “Awesome,” or “We are on track today!”</p> <p><b>Code:</b> <i>A dense schedule of general praise would include at least 10 general praise statements over the course of one lesson.</i></p> <ul style="list-style-type: none"> <li>Teachers with fewer than 5 general praise statements will be coded as a 0.</li> <li>Teachers with 5-10 general praise statements will be coded as a 1.</li> <li>Teachers with more than 10 general praise statements will be coded as a 2.</li> </ul>
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Specific Praise	<p><b>Definition:</b> Specific praise in the form of repeating students’ correct response (e.g., “Yes, the word is ring!”)</p> <p><b>Code:</b> <i>A dense schedule of specific praise would include at least 30 specific praise statements over the course of one lesson.</i></p> <ul style="list-style-type: none"> <li>Teachers with fewer than 15 specific praise statements will be coded as a 0.</li> <li>Teachers with 16-29 specific praise statements will be coded as a 1.</li> <li>Teachers with at least 30 specific praise statements will be coded as a 2.</li> </ul>
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Think Time	<p><b>Definition:</b> Teacher uses proper amount of think time for comprehension questions (5-6 s) before requiring students to respond</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>• Teachers will be coded as a 0 if there are 3 or more occurrences of short (less than 5 seconds) of think time.</li> <li>• Teachers will be coded as a 1 if there are 1-2 occurrences of short (less than 5 seconds) of think time.</li> <li>• Teachers will be coded as a 2 if there are no occurrences of short (less than 5 seconds) of think time.</li> </ul>
Immediate error correction	<p><b>Definition:</b> An immediate error correction occurs within 3s of a student error or before the student responds to a prompt.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>• A teacher is coded 0 if more than 2 errors have greater than a 3s delay prior to error correction.</li> <li>• A teacher is coded 1 if 1-2 errors have greater than a 3s delay prior to error correction.</li> <li>• A teacher is coded 2 if 0 errors have greater than a 3s delay prior to error correction.</li> </ul>
Behavior Management	<p><b>Definition:</b> Teacher employs DI-related strategies for behavior management, which can include use of Teacher-Student Game, practice answering on signal, assigning points as appropriate.</p> <p><b>Code:</b></p>

	<ul style="list-style-type: none"> <li>Teacher is assigned a 0 if no behavior management strategies are used but opportunities are present for their use.</li> <li>Teacher is coded a 1 if behavior management strategies are used when 1-3 opportunities are present for their use.</li> <li>Teacher is coded a 2 if behavior management strategies are used when more than 3 opportunities are present for their use.</li> </ul>
Reteaches Concepts	<p><b>Definition:</b> A teacher reteaches a concept by repeating a section or parts of the lesson; Teachers are directed within the script and within training to follow repeat sections in which errors occurred.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>A teacher is coded as 0 if 3 or more opportunities for reteaching occur but reteaching does not occur.</li> <li>A teacher is coded as 1 if 1-2 opportunities for reteaching occur and reteaching does not occur.</li> <li>A teacher is coded as 2 if no opportunities for reteaching occur and reteaching does not occur.</li> </ul> <p><b>NOTE: If no opportunities for reteaching occur, teacher is awarded full points.</b></p>
Specific Error Correction Procedure	<p><b>Definition:</b> The error correction procedure involves the teacher modeling the correct response and students repeating the task when error correcting.</p>

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(Model-

Lead-Test)

**Code:**

- A teacher is coded a 0 if the teacher does not model and/or require the student to repeat the task when error correcting on more than 5 opportunities.
- A teacher is coded a 1 if the teacher does not model and/or require the student to repeat the task when error correcting on more than 3-5 opportunities.
- A teacher is coded a 2 if the teacher does not model and/or require the student to repeat the task when error correcting on 2 or fewer opportunities

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Brisk Pace

**Definition:** “Brisk Pace” is a term used in training DI programs that refers to the reading of DI scripts at a conversational pace employing appropriate features of prosody such as intonation, tone, stress, and rhythm; Non-fluent reading would be considered “not brisk.”

**Code:**

- A teacher is coded as a 0 if a brisk pace is not maintained for at least half the lesson.
  - A teacher is coded as a 1 if a brisk pace is maintained at least half of the lesson, but not the entire lesson.
  - A teacher is coded as a 2 if a brisk pace is maintained the entire lesson
-

Time Allocation	<p><b>Definition:</b> DI lessons are designed to be completed within a certain time allocation (30-45 minutes). Lessons are sequenced in order to minimize student misunderstanding or difficulty, which would significantly alter the pace of instruction.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>• A teacher is coded as 0 if the lesson is completed in fewer than 20 minutes or more than 1 hour (withstanding interruptions outside of the teacher's control such a school announcements or scheduling interruptions).</li> <li>• A teacher is coded a 1 if the lesson is completed within 20-29 minutes or 46-60 minutes (withstanding interruptions outside of the teachers control such as school announcements or scheduling interruptions.)</li> <li>• A teacher is coded a 2 if the lesson is completed during the estimated time (withstanding interruptions outside of the teacher's control such a school announcements or scheduling interruptions).</li> </ul>
Tone	<p><b>Definition:</b> The teacher employs an upbeat, positive tone throughout the lesson.</p> <p><b>Code:</b></p> <ul style="list-style-type: none"> <li>• A teacher is coded a 0 if the definition is not met through the entire lesson.</li> <li>• A teacher is coded a 1 if the definition is met up to 75% of the lesson.</li> <li>• A teacher is coded a 2 if the definition is met 76% or more of the duration of the lesson.</li> </ul>

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Independent	<b>Definition:</b> The teacher requires students to use the independent workbook
Workbook	<b>Code:</b> <ul style="list-style-type: none"> <li>• A teacher is coded a 0 if students are not required to use the independent workbook at the end of the lesson.</li> <li>• A teacher is coded a 1 if students are required to use the independent workbook but the work is not monitored/scored.</li> <li>• A teacher is coded a 2 if students are required to use the independent workbook at the end of the lesson and the work is scored and recorded.</li> </ul>

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## APPENDIX D

### Sample Direct Instruction

#### Lesson **WORD-ATTACK**

### **SKILLS**

#### **EXERCISE 1**

##### **PRONUNCIATIONS**

**Note:** Do not write the words on the board. This is an oral exercise.

##### **Task A**

1. Listen. His glasses had a gold **rim**. (Pause.)  
**Rim**. Say it. (Signal.) *Rim*.
2. Next word: **if**. Say it. (Signal.) *If*.
3. (Repeat step 2 for **im**, **reem**, **ram**.)
4. (Repeat all the words until firm.)

##### **Task B It, fit, miff**

1. I'll say words that have the sound **īī**.  
What sound? (Signal.) *īī*. Yes, **īī**.
2. (Repeat step 1 until firm.)
3. Listen: **it**, **fit**, **miff**. Your turn: **it**. Say it.  
(Signal.) *It*. Yes, **it**.
4. Next word: **fit**. Say it. (Signal.) *Fit*. Yes, **fit**.
5. Next word: **miff**. Say it. (Signal.) *Miff*.  
Yes, **miff**.
6. (Repeat steps 3–5 until firm.)
7. What's the middle sound in the word **ffīīīt**? (Signal.) *īī*. Yes, **īī**. (Repeat step 7 until firm.)

##### **Task C Mat, meet**

1. Listen: **mat**. Say it. (Signal.) *Mat*.
2. I'll say the first sound in the word **mmmăăăt**. (Pause.) **mmm**. What's the first sound? (Signal.) *mmm*. Yes, **mmm**.
3. Say the middle sound in the word

**mmmăăăt**. Get ready. (Signal.) *ăăă*.

Yes, **ăăă**.

##### **To correct:**

- a. (Hold up one finger.) **mmm**.
- b. (Hold up two fingers.) **ăăă**.
- c. What's the middle sound in the word **mmmăăăt**? (Signal.) *ăăă*.

Yes, **ăăă**.

- d. (Repeat step 3 until firm.)

4. Listen: **meet**. Say it. (Signal.) *Meet*.
5. I'll say the first sound in the word **mmēēēt**. (Pause.) **mmm**. What's the first sound? (Signal.) *mmm*. Yes, **mmm**.
6. Say the middle sound in the word **mmēēēt**. Get ready. (Signal.) *ēēē*.

Yes, ēēē.

7. One of those words has the middle sound ēēē. I'll say both words again: **mat** (pause) **meet**. Which word has the middle sound ēēē? (Signal.) *Meet*. Yes, **meet**.

## EXERCISE 2

### SOUND INTRODUCTION

1. (Point to **f**.) This letter makes the sound **fff**. What sound? (Touch.) *fff*.
2. Your turn. Say each sound when I touch it.
3. (Point to **f**.) What sound? (Touch under **f**.) *fff*.
4. (Repeat step 3 for **ē, m, ĭ, r, d, ă, t, s**.)

### To correct:

- a. (Say the sound loudly as soon as you hear an error.)
- b. (Point to the sound:) This sound is . What sound? (Touch.)
- c. (Repeat the series of letters until all the students can correctly identify all the sounds in order.)

**f e m**

**ī r d**

**a t s**

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**f e m**

**ī r d**

**a t s**

### Individual test

I'll call on different students to say all the sounds. If everybody I call on can say all the sounds without making a mistake, we'll go on to the next exercise. (Call on two or three students. Touch under each sound. Each student says all the sounds.)

## EXERCISE 3

### SAY THE SOUNDS

**Note:** Do not write the words on the board. This is an oral exercise.

1. Listen: **fffēēē**. (Hold up a finger for each sound.)
2. Say the sounds in (pause) **fffēēē**. Get ready. (Hold up a finger for each sound.)



- fffēēē*. (Repeat until the students say the sounds without stopping.)
3. Say it fast. (Signal.) *Fee*.
4. What word? (Signal.) *Fee*. Yes, **fee**.
5. (Repeat steps 2–4 for **if, fish, sam, at, me, rim, she, we, ship, fat, miff**.)

#### EXERCISE 4

#### WORD READING

##### Task A Eed

1. You're going to read each word. First you sound it out; then you say it fast.
2. (Touch the ball of the arrow for the first word:) Sound it out. Get ready. (Touch under **ee, d**:) *ēēēd*. (Repeat until the students say the sounds without pausing.)

##### To correct sound errors:

- a. (Say the correct sound loudly as soon as you hear an error.)
  - b. (Point to the sound:) What sound? (Touch.)
  - c. (Repeat until firm.)
  - d. (Repeat step 2.)
3. Again. Sound it out. Get ready. (Touch under **ee, d**:) *ēēēd*. (Repeat until firm.)
  4. (Touch the ball of the arrow:) Say it fast. (Slash right, along the arrow:) *eed*. Yes, **eed**.

##### To correct say-it-fast errors:

- a. (Say the correct word:) **eed**.
- b. (Touch the ball of the arrow:) Say it fast. (Slash right:) *eed*.
- c. (Return to step 2.)

**eed**

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##### Task B Seed

1. (Touch the ball of the arrow:) Sound it out. Get ready. (Touch under **s, ee, d**:) *sssēēēd*. (Repeat until the students say the sounds without pausing.)
2. Again. Sound it out. Get ready. (Touch under **s, ee, d**:) *sssēēēd*. (Repeat until firm.)
3. (Touch the ball of the arrow:) Say it fast. (Slash right:) *Seed*. Yes, **seed**.
4. (Repeat steps 1–3 for **seem, at, eet, it, if**.)

**seed**

**seem**

**at**

**eet**

**it**

# if

## **Task C Im [ĩm]**

1. (Touch the ball of the arrow for the next word:) Sound it out. Get ready. (Touch under **i, m**:) *ĩmmm*. (Repeat until the students say the sounds without pausing.)
2. Again. Sound it out. Get ready. (Touch under **i, m**:) *ĩmmm*. (Repeat until firm.)
3. (Touch the ball of the arrow:) Say it fast. (Slash right:) *im*. Yes, **im**.
4. (Repeat steps 1–3 for **am, să, see, fă**.)

# im

# am

# să

# see

# fă

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## **Task D Fee**

1. (Touch the ball of the arrow for the next word:) Sound it out. Get ready. (Touch under **f, ee**:) *fffēēē*. (Repeat until the students say the sounds without pausing.)
2. Again. Sound it out. Get ready. (Touch under **f, ee**:) *fffēēē*. (Repeat until firm.)
3. (Touch the ball of the arrow:) Say it fast. (Slash right:) *Fee*. Yes, **fee**.
4. (Repeat steps 1–3 for **fi, fit, fat, feet**.)

# fee

# fi

# fit

# fat

# feet

## **EXERCISE 5**

### **PRONUNCIATIONS**

**Note:** Do not write the words on the

board. This is an oral exercise.

1. Listen: **sam**. Say it. (Signal.) *Sam*.
2. I'll say the first sound in the word **sssăămmm**. (Pause.) **sss**. What's the first sound? (Signal.) *sss*. Yes, **sss**.
3. Say the middle sound in the word **sssăămmm**. Get ready. (Signal.) *ăăă*. Yes, **ăăă**.

#### To correct:

- a. (Hold up one finger.) **sss**.
- b. (Hold up two fingers.) **ăăă**.
- c. What's the middle sound in **sssăămmm**? (Signal.) *ăăă*. Yes, **ăăă**.
- d. (Repeat step 3 until firm.)
4. Listen: **seem**. Say it. (Signal.) *Seem*.
5. I'll say the first sound in the word **sssēēmmm**. (Pause.) **sss**. What's the first sound? (Signal.) *sss*. Yes, **sss**.
6. Say the middle sound in the word **sssēēmmm**. Get ready. (Signal.) *ēēē*. Yes, **ēēē**.
7. One of those words has the middle sound **ăăă**. I'll say both words again: **sam** (pause) **seem**. Which word has the middle sound **ăăă**? (Signal.) *Sam*. Yes, **sam**.

## WORKBOOK EXERCISES

**Note:** Pass out the Workbooks. Direct the students to open their Workbooks to Lesson 6.

(Award 6 points if the group worked well during the word attack. Then say:) Remember, you can earn up to 8 points for doing a good job on your Workbook lesson.

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=

i e m f r d a t s

1. at 2. at

1. im 2. if 3. it

4. sa 5. eet 6. reem

7. fi t 8. seem 9. ad

10. fa 11. sad

f i s e d m t a

i r e t s a d m

m s

i f s a d

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### EXERCISE 6

#### SOUND DICTATION

1. Everybody, touch part 1 in your Workbook. ✓
  - These are the sounds you did before.Say all the sounds once more before you write the letters.
2. Touch the first sound. ✓
  - What sound? (Clap.) *īīī*. Yes, **īīī**.
3. Touch the next sound. ✓
  - What sound? (Clap.) *ēēē*. Yes, **ēēē**.
4. (Repeat step 3 for each remaining sound.)

5. Now you're going to write the letters for the sounds I say. First sound. (Pause.) **fff**. What sound? (Clap.) *fff*.

- Write it in the first blank.

(Observe students and give feedback.)

6. Next sound. (Pause.) **īīī**. What sound? (Clap.) *īīī*.

- Write it in the next blank.

(Observe students and give feedback.)

7. (Repeat step 6 for **sss, ēēē, d, mmm, t, āāā, īīī, rrr, ēēē, t, sss, āāā, d, mmm**.)

8. (Check that students can write all the letters without errors.)

## EXERCISE 7

### WORD COMPLETION

1. Everybody, touch word 1 in part 2. ✓

2. Sound it out. Get ready. (Clap for each sound as the students touch under **a, t**:) *aaat*. (Repeat until the students say the sounds without pausing.)

3. Say it fast. (Signal.) *At*. Yes, **at**.

4. You're going to change **at** to say (pause) **mat**. What will it say? (Signal.) *Mat*.

5. The first sound in **mat** is **mmm**. What sound? (Signal.) *mmm*.

- Write the letter for **mmm** before (pause) **at**.

(Observe students and give feedback.)

6. You started with the word (pause) **at**. Now you have the word **mat**. What word did you start with? (Signal.) *At*. Yes, **at**.

- And what word do you have now?

(Signal.) *Mat*. Yes, **mat**.

7. Touch the word on the next arrow. ✓

- That word says (pause) **at**.

8. You're going to change **at** to say (pause) **sat**. What will it say? (Signal.) *Sat*.

9. The first sound in **sat** is **sss**. So, what do you write before (pause) **at**? (Signal.) *sss*. Yes, **sss**.

- Do it.

(Observe students and give feedback.)

10. You started with the word (pause) **at**.

What word do you have now? (Signal.)

*Sat*. Yes, **sat**.

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## EXERCISE 8

### WORD READING: Workbook

1. Everybody, touch word 1 in part 3. ✓

2. Sound it out. Get ready. (Clap for each sound as the students touch under **i, m**:) *īīīmmm*. (Repeat until the students say the sounds without pausing.)

### To correct sound errors:

a. (Say the correct sound loudly as soon as you hear an error.)

b. Everybody, touch the sound . What sound? (Signal.)

c. (Repeat step 2.)

3. Again. Sound it out. Get ready. (Clap for each sound:) *īīīmmm*.

- Say it fast. (Signal.) *im*. Yes, **im**.

### To correct errors:

- a. (Say the correct word:) **im**.
  - b. What word? (Signal.) *im*.
  - c. You're going to sound it out again.  
Get ready. (Clap for each sound:)  
*ĩĩmmm*.
  - d. Say it fast. (Signal.) *im*.
  - e. (Go to the next word.)
4. Touch word 2. ✓
  5. Sound it out. Get ready. (Clap for each sound as the students touch under **i, f**.)  
*ĩĩfff*. (Repeat until the students say the sounds without pausing.)
  6. Again. Sound it out. Get ready. (Clap for each sound:) *ĩĩfff*.  
• Say it fast. (Signal.) *If*. Yes, **if**.
  7. (Repeat steps 4–6 for words 3–11: **it, să, eet, reem, fit, seem, ad, fã, sad**.)

### Individual test

(Call on each student to read two words in part 3.) Sound out each word and then say it fast. Remember to touch the sounds as you say them. Don't stop between the sounds.

### EXERCISE 9

#### WORD COPYING

1. Everybody, touch part 4. ✓  
• You're going to write some of the words you just read.
2. The word you're going to write on the first arrow is **if**. What word? (Signal.) *If*.
3. Find **if** and write it just as it is written in part 3.  
(Observe students and give feedback.)
4. The word you're going to write on the

next arrow is **sad**. What word? (Signal.)

*Sad*.

5. Find **sad** and write it just as it is written in part 3.

(Observe students and give feedback.)

### EXERCISE 10

#### MATCHING SOUNDS

1. Everybody, touch part 5. ✓  
• You're going to draw lines to match the letters. Get ready to say the sounds of the letters in the first column.
2. Touch the first letter. ✓  
• What sound? (Clap.) *fff*.
3. Touch the next letter. ✓  
• What sound? (Clap.) *ĩĩ*.
4. (Repeat step 3 for **s, r, t, ě**.)
5. Later, you'll draw lines to match the letters.

### EXERCISE 11

#### MATCHING AND COPYING SOUNDS

1. Everybody, touch part 6. ✓
2. Later, you'll write letters in the blanks of this matching exercise.

### EXERCISE 12

#### CIRCLE GAME

1. Everybody, touch part 7. ✓
2. What will you circle in the first two lines? (Clap.) *fff*.
3. What will you circle in the next two lines? (Clap.) *t*.
4. What will you circle in the last two lines? (Clap.) *fff*.

## APPENDIX E

### Social Validation Questionnaire

Teacher\_\_\_\_\_ Date\_\_\_\_\_

Academic Coach\_\_\_\_\_ School\_\_\_\_\_

#### **Social Significance Goals**

1. How do you feel about participating in coaching?
  
  
  
  
  
  
  
  
  
  
2. Do you anticipate that this coaching will influence your future teaching? Why?
  
  
  
  
  
  
  
  
  
  
3. What aspects of coaching do you like the most? Why? Which aspects of coaching do you like the least? Why?
  
  
  
  
  
  
  
  
  
  
4. Do you think coaching is likely to be effective to help increase a teacher's adherence to a DI program? Do you think that adherence is positive or necessary?
  
  
  
  
  
  
  
  
  
  
5. Are you satisfied with the outcomes of this coaching project? Why?
  
  
  
  
  
  
  
  
  
  
6. Do you think that the type of coaching and feedback you received as a part of this project would be beneficial for other teachers who teach DI programs? Why or why not?

## APPENDIX F

### Demographic Data Collection Sheet

1. Areas of Certification:

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2. Degree(s) earned:\_\_\_\_\_

3. Total years teaching:\_\_\_\_\_

4. Number of years teaching Direct Instruction

(DI):\_\_\_\_\_

5. DI programs previously and/or currently taught:

---

6. DI Training received (by whom, when, duration):

---

7. Have you received any previous DI-related coaching or mentoring? If so, indicate when, by whom, and for how long:

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8. Age Range:    \_\_\_ 18-24    \_\_\_ 25-34    \_\_\_ 35-44    \_\_\_ 45-54    \_\_\_ 55-64  
                  \_\_\_ 65-74    \_\_\_ 75 years or older

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