The Effects of Self-Observation on Implementation of Direct Instruction Reading Curricula

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THE EFFECTS OF SELF-OBSERVATION ON IMPLEMENTATION OF DIRECT INSTRUCTION READING CURRICULA

by

Katherine Mahaffy

A dissertation submitted to the Graduate College in partial fulfillment of the requirements for the degree of Doctor of Philosophy
Psychology
Western Michigan University
December 2019

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ACKNOWLEDGEMENTS

I am truly grateful to be surrounded by colleagues, friends, family, and professionals who have helped me achieve more than I could have ever known I would accomplish when packing up my life in sunny Arizona for graduate school in Kalamazoo, Michigan.

I would like to thank Dr. Richard Malott and Dr. Denise Ross for the opportunity to learn, work, and practice in each of their labs. I would not be the behavior analyst I am today without each of your training and support. You have each dedicated hours, weekends, and holidays to ensuring I have the support I need to achieve a PhD in Behavior Analysis. I would also like to thank my parents, Matt and Salli, for being my biggest fans and never flinching when I said I was moving to at first temporarily, and then permanently, Kalamazoo. I am so grateful to have them in my cheering section forever. I would also like to thank my brothers, sister-in-laws, and friends who have somehow found ways to visit me and learn that “there really is a Kalamazoo”. I would not have the balance and perseverance to succeed without you.

I am so grateful for my committee members, Dr. Denise Ross, Dr. Richard Malott, Dr. Kelly Kohler, and Dr. Luchara Wallace, for taking the time to review my work and provide support for my research and my passion in behavior analysis. I am proud to have each one of you serving on my committee.

Katherine Mahaffy
The current study evaluated the effects of structured self-observations on the rate and accuracy of learn unit presentations by graduate student tutors in a reading program. Four graduate students were trained to implement reading curricula using instructions, modeling, and the training manuals for reading curricula. Dependent variables were accuracy of antecedents, accuracy of consequences, and rate of learn units for the lesson. A secondary dependent variable was the rate of contingent social praise and token delivery during the lesson. During the intervention, tutors learned how to record learn units using the Teacher Performance Rate and Accuracy Scale (TPRA) and then used videos of their own reading sessions to score the accuracy and rate of learn unit delivery. Feedback was given on accuracy of TPRA scoring after observation. Following each observation, tutors presented a reading lesson; dependent variables were measured, and no feedback was given. Results suggested that structured self-observations of learn units improved the accuracy of consequences and rate of learn units. All four participants had a higher median accuracy of consequences in intervention than baseline. For one participant, the intervention was effective for improving the rate of correct learn units as well. Implications of these findings for training teachers to use reading curricula are discussed as well as how these findings relate to existing research on structured self-observations and tutor training.

**Key terms:** Self-observation, reading instruction, Direct Instruction, learn units
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INTRODUCTION

Reports of reading achievement suggest that students in American schools are underperforming in reading. For instance, the National Assessment of Educational Progress (NAEP) reported that 35% of fourth graders read at or above the proficient level (U.S. Department of Education, 2019). These recent findings show a slight decline in percentage of students at or above the proficient level from the 2017 NAEP report, which reported that 37% of fourth graders read at or above the proficient level. Since there have been only marginal improvements in reading performance for American children in the last 20 years, there is a need for interventions that can support reading instruction for young children.

Various factors may impact a child’s reading abilities, but detection and intervention for struggling students prior to the third grade has been shown to be a critical window for acquiring proficiency in reading. Hernandez (2011) studied the relationship between third grade reading proficiency and high school graduation for approximately 4000 students born between 1979 and 1989. Results showed that one in six children (16%) who were not proficient readers by third grade did not graduate from high school or had delayed graduation. When economically disadvantaged students were not reading proficiently by the third grade, the percentage delayed or never graduating from high school rose to 26% (Hernandez, 2011).

Similarly, a longitudinal study conducted by McNamara, Scissons, and Gutknecth (2011) investigated reading achievement of 382 students from kindergarten to third grade. They found that students who ranked lower in reading achievement, when first assessed in kindergarten, were likely to not only remain lower but actually fall further behind their grade-level peers as they progressed toward third grade (McNamara et al., 2011). This widening gap between the
high achieving and struggling readers illustrates the critical importance of equipping teachers with strategies to identify and intervene more effectively for these at-risk students.

**Professional Development of Teachers in Reading**

Some studies suggest a need for professional development and training in reading instruction for both pre-service and in-service teachers. In 2010, the Institute of Educational Sciences (Salinger et al., 2010) collected data from a sample of more than 2000 teachers in pre-service training programs from 99 teacher-certification programs in the United States. The purpose of the study was to examine how much pre-service training programs focused on five essential components of reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Specifically, participants were asked to report on how much of their pre-service training focused on each of those reading instruction components and answer multiple-choice questions in a knowledge assessment. Only 25% of participants reported a strong overall focus on reading instruction in their pre-service training. On an assessment of teachers’ knowledge of reading instruction, participants achieved an average of 57% correct. This study suggests that more focus on reading instruction may be necessary in preservice training and a large number of teachers are entering the field without extensive training in the essential components of reading instruction.

**Academic Engagement in Reading**

An important component of reading instruction is academic engagement. Past research has offered several different definitions of academic engagement and, more specifically, engaged reading or engagement during reading activities. Greenwood, Horton, and Utley (2002) define academic engagement using observable classroom behaviors often described as enabling or promoting skills (Greenwood et al., 2002). These behaviors include writing, participating in
assigned work, reading aloud or silently, as well as asking or answering questions. From a behavioral perspective of academic engagement, Greer referred to the teacher as a “strategic scientist” capable of improving academic engagement through contingency shaped teaching (Greer, 1991). He suggests that academic success is determined by variables controlled by the teacher and thus establishing effective teaching strategies are the means by which we should be targeting academic engagement.

A behavior-analytic definition of academic engagement requires consideration of a complex set overt and covert behaviors, that increase the likelihood of a student learning or behaving differently in the future, as a consequence of academic instruction. Skinner (1968) discussed attending or paying attention to the teacher as a form of self-management in which the student behaves in such a way that subsequent behavior is more likely to be reinforced. By attending to and then subsequently responding in some way to the teacher’s instruction or other instructional material in the environment, reinforcement of the second response strengthens the first response of attending. Further, Skinner emphasizes the importance of quantifying the accuracy of instructional units as the basic unit by which effective teaching should be measured (Skinner, 1968).

**The Direct Instruction Model**

The Direct Instruction Follow Through Model (DI) was designed by Siegfried Engelmann and colleagues to teach core academic skills including reading and math to kindergarten through third grade students (Engelmann, Becker, Carnine, & Gersten, 1988). This model is based on key assumptions that align closely with the behavior-analytic definition of academic engagement and the emphasis on instructional units as the basic unit of effective teaching measurement (Skinner, 1968). The first DI assumption is that all students can be taught.
Thus, if a student fails to learn, it is because of a barrier in instruction. The second assumption is that basic skills must be taught systematically, as prerequisites to more advanced skills and higher-order applications. This contradicts teaching approaches that emphasize teaching complex problem-solving skills first to enable a student to acquire the building-block competencies. The third assumption is that disadvantaged or struggling students need to be taught at a faster rate in order to close the gap between their academic level and that of their peers.

Based on these three assumptions, the DI model requires that students are assessed and grouped with peers at their academic level as opposed to being taught solely at age-based grade level. DI lessons are scripted to promote efficiency of instruction and adherence to the instructional building blocks necessary to teach each prerequisite skill. DI curricula must be field-tested and validated to retain the integrity of the program (Becker & Carnine, 1980; Engelmann, Becker, Carnine, & Gersten, 1988). The term “small di” refers to a teaching philosophy that incorporates some, but not all, principles of the Direct Instruction model.

Direct Instruction has been shown to be an effective teaching model with the most significant and extensive study supporting this approach being Project Follow Through (Engelmann et al., 1988). Sponsored by the federal government to determine the best approach to teaching at-risk students from kindergarten to third grade, this longitudinal study examined nine models proposed to target this population in over 170 different communities. Direct Instruction was the only model that showed consistently positive outcomes across reading, math, language, and spelling. Follow-up results showed that students receiving Direct Instruction also had better long-term outcomes than their peers; for example, they were more likely to finish high school and pursue higher education.
Quantifying the Accuracy of Instructional Units

One tool to increase academic engagement by teachers is the measurement of learn units. The learn unit is one proposed tool to measure the quality and integrity of instruction delivered by a teacher. The learn unit entails interlocking operants of responses from both the teacher and the student. For example, the attentiveness of a student (i.e., sitting and facing the teacher) is a discriminative stimulus (SD) for the teacher to present the first instruction. The teacher’s response is consequated by a subsequent response emitted by the student (i.e., answering the question or repeating the letter combination sound). The student’s behavior then occasions a response from the teacher either as a form of correction for an incorrect student response or a praise statement following a correct response. This is referred to as a learn unit because both the teacher and the student “learn” from the interaction (Ross & Smalls, 2007).

The Comprehensive Application of Behavior Analysis to Schooling, often referred to as CABAS, is a behavior analytic education model. Within the CABAS model, teacher training and mentoring is very systematically conducted to instruct, model, and provide feedback on effective behavior analytic teaching (Singer-Dudek, Speckman, & Nuzzolo, 2010). In CABAS classrooms, learn units should be delivered at a rate of approximately 4 correct learn units per minute. Learn units serve as the basic unit of analysis for measuring the rate and accuracy of teacher instruction as well as student learning (Singer-Dudek et al., 2010). Because learn units examine actual opportunities for a student to respond as opposed to scheduled instructional time, it offers a more accurate representation of student learning and engagement.

Another study examined a variation on traditional direct observation and feedback by implementing a “bug-in-ear” technology to provide real-time feedback on delivery of learn units (Goodman, Brady, Duffy, Scott, & Pollard, 2008). The participants were three teachers with less
than three years of experience working in special education classrooms. Using a multiple baseline design across teachers, the intervention consisted of immediate feedback using “bug-in-ear” technology on delivery of antecedents and consequences. The dependent variable in this study was rate and accuracy of learn units measured by collecting data on antecedents and consequences provided by teacher contingent on student behavior. “Bug-in-ear” feedback consist of one- to three-word prompts contingent on incorrect or missing components of intact learn unit instruction. For example, the researcher may prompt “Correction, ask again” if the student did not respond with five seconds to the teacher’s antecedent instruction. Additionally, the researcher gave “bug-in-ear” feedback on the pace of instruction with prompts such as “keep teaching” if the teacher went off topic or “speed up” if pace became too slow. During intervention, all three teachers achieved 100% accuracy of learn unit delivery with the “bug-in-ear” prompts. Additionally, the rate of instruction improved during intervention for all three participants with some variation in overall rate across participants. Two of the three participants sustained increased rate and accuracy of learn unit delivery after intervention removed (Goodman et al., 2008).

**Teacher Performance Rate and Accuracy Scale (TPRA)**

The Teacher Performance Rate and Accuracy Scale (TPRA) is a structured method to conduct direct observation of instruction delivery by a teacher and give feedback on important components of academic engagement (Ross, Singer, & Greer, 2005). The TPRA was developed to capture the components of instruction demonstrated to be effective including higher rates of opportunities to respond, accurate delivery of antecedents and appropriate consequences as well as higher rates of correct student responses (Greer, 2002). Using the definition of academic engagement described previously, the TPRA is designed to measure academic engagement by
counting the correct components of each learn unit provided in a lesson (Ross, Singer, & Greer, 2005). Previous research has demonstrated the efficacy of the TPRA feedback in improving teacher implementation of instruction, accuracy and rate, and correlated with improved students’ learning. Ingham and Greer (1992) demonstrated a functional relationship between better scores on the TPRA and correct student responses as compared to nonspecific feedback. In the CABAS model, TPRA observations are conducted by supervising behavior analysts and senior teachers who provide feedback on learn unit delivery to teachers in training (Singer-Dudek, Speckman, & Nuzzolo, 2010).

**Previous Research on Observations and Feedback Using TPRA**

While the TPRA has been used most extensively in the CABAS program to record learn units and provide feedback, some more recent research exists to show the efficacy of this tool in training and providing performance feedback in various settings. A study conducted by Yuan, Lee, and Kimmel (2018) examined the use of the TPRA as part of a training package to improve parent participants implementation of discrete trial training procedures at home. For the training package, parents were trained to conduct observations using the TPRA form as well as given direct feedback on their implementation of intact learn units using the TPRA. The dependent variables in this study included accuracy and rate of implementation of two discrete-trial procedures, the number of goals achieved by the student on home programming, and the parent’s score on a quiz assessing knowledge of the three-term contingency. Employing a multiple-baseline design across three parent-child dyads, parents were first trained on skill acquisition procedures and given feedback on their accuracy according to TPRA scoring by the researcher in a training setting. Additionally, parents were trained to use the TPRA first conducting video observations of confederates as well as conducted in-vivo observations of teachers. Once the
parent met mastery criterion in each of these training settings, their accuracy of implementing trained discrete-trial procedures improved. Additionally, results of this study suggest that implementation of novel home programs improved following the training package using the TPRA. All three parents in the study also performed better on the post-test measuring knowledge of the three-term contingency. These findings suggest that receiving feedback on TPRA score as well as observing correct and incorrect learn units using the TPRA could improve fidelity of performance (Yuan et al., 2018).

**Previous Research on the Observer Effect and Performance**

In the growing body of research on improving staff performance and adherence to prescribed task steps, recent studies have examined the effect of observing others and providing feedback on the performance of the observer. Alvero, Rost, and Austin (2008) studied the effects of conducting safety observations of another person’s behavior on the observer’s own safety behavior performing similar workplace tasks. During baseline, participants in this study were given written instructions for various assembly tasks to complete and safety performance was measured. Following baseline, participants were split into two groups and each group was given specific safety information on different assembly tasks. The groups were counterbalanced in the information phase in that neither of the groups received safety information for all behaviors and the separate groups had information on different behaviors. During this phase, participants were again asked to perform all assembly tasks and safety behavior was measured.

Sasson and Austin (2005) conducted another study examining the effects of different interventions aimed to improve the ergonomic safety behavior of eleven staff members in two departments. The independent variables in the study included a short training offering instruction on ergonomic safety, direct observations of other participant’s safety behavior, and direct
feedback on percent of target behaviors performed safely. Using a within subject, multiple-baseline design, the researchers evaluated each of the interventions and measured change in the participant’s safety behavior. They found that conducting observations might, aside from additional training variables, could directly change the observer’s safety behavior. Additionally, the study suggested a correlation between the observer’s accuracy in detecting and recording safe behavior in the workplace with engaging in those correct behaviors following observation (Sasson & Austin, 2005).

Bishop, Snyder, and Crow (2015) conducted a study on the effects of video self-monitoring in the delivery of instructional trials within a classroom setting. Working with three preschool teachers, they trained staff to record antecedents, student behaviors, and consequences on a self-monitoring coding form. The intervention involved multiple components with self-observations conducted in all three phases accompanied by graduated training and feedback in each subsequent phase. The preliminary intervention phase consisted of video self-observations of instructional trials with open-ended questions to help the teacher identify components of instruction that had been delivered correctly or completely. The second intervention phase consisted of video self-observations of instructional trials after the participant had been trained on using the structured observation tool. Once trained to a mastery criterion, the participant used the coding system during self-observations without any feedback from the researcher. In the final phase of video self-observations, the participant conducted video self-observations followed by feedback from the researcher on accuracy of scoring on the observation form. Results showed that two of the three teachers had more accurate self-monitoring of learn unit delivery as a result of the intervention package. Additionally, as accurate recording of learn units improved, researchers observed an increase in implementation of complete teacher learn units. This study
provides evidence for the efficacy of using self-monitoring combined with structured observation of learn units and feedback on scoring of learn units to increase delivery of instruction material in a classroom setting.

Sarto (2017) conducted four experiments to assess the effects of observations on teacher accuracy in presenting learn units. In all four experiments, Sarto worked with hired behavior technicians at an agency providing applied behavior analytic and special education services to children with autism or other developmental disabilities. Some of the participants in these studies were working toward their board certification as behavior analysts and the procedures targeted included verbal behavior curriculum ranging from pre-listener to advanced listener and speaker skills. In her first experiment, Sarto assessed whether training teacher trainers to use the TPRA for observations of instruction to determine learn unit accuracy would improve their own accuracy in instruction as well as the learn unit accuracy of their trainees. Using a treatment package, Sarto first trained the participants to use the TPRA form to observe videos of confederates and provided feedback on accurate use of the TPRA form to score learn unit accuracy. Phases two and three of the experiment involved using the TPRA form to score learn unit accuracy of trainees in-vivo instruction and their own instruction through self-observation of videos, respectively. Results showed that both teacher trainer and trainees’ accuracy of learn units improved following the treatment package. In her second experiment, Sarto assessed the effects of time, practice, and experience on presentation of learn units. Results showed that while performance improved slightly over time and with practice, none of the participants successfully met mastery criterion until given explicit feedback on learn unit delivery.

Sarto’s third and fourth experiments share the most similar characteristics with the current study. For experiment three, Sarto examined the effects on learning by observing learn
unit accuracy of a confederate. The three participants in this study were trained on the components of the TPRA form before observing a standardized set of videos. The videos consist of different teachers, students, and procedures and were typically about twenty learn units in length. The participants were given immediate feedback on their accuracy of completing the TPRA form following observations. The dependent variable in this study was the accuracy of learn units of the participant following observation. Similarly, the final experiment conducted by Sarto (2017) examined the same dependent variable following observations of oneself scored using the TPRA form. During baseline, the teacher’s accuracy was measured using the TPRA form without any feedback on performance. In experiment three, all of the teachers required in-situ feedback following the intervention to meet mastery criterion. However, all of the teachers in experiment four met mastery criterion following self-observations of pre-recorded videos without any in-situ feedback to meet mastery criterion. Thus, the TPRA observations conducted on videos of one’s own instruction seemed to be more effective in changing the teacher’s own behavior than observing and scoring a confederate’s behavior (Sarto, 2017).

Purpose of Current Study

The primary purpose of the current study was to extend existing research on the TPRA by evaluating whether using the TPRA during video self-observations changed the accuracy and rate of instruction for graduate student tutors. This study also investigated whether the effects of using the TPRA generalized to similar, untrained reading curricula.

METHODS

Participants

The participants in this study were four graduate students pursuing master’s degrees in psychology or special education at a midwestern university. They were recruited from a pool of
students in a master’s program because of their interest in applying behavior analysis to schooling, and because they had not been previously trained to implement the targeted curriculum or the observation form. They received a $20 gift card or a copy of the curriculum for completing the study.

**Pilot participant.** The pilot participant was a first-year graduate student seeking coursework and practicum experience to become a Board-Certified Behavior Analyst (BCBA). She was not a certified teacher but reported that she had worked with general education students prior to the study. She also reported less than a year of prior experience working as a behavior technician and possibly using a Direct Instruction procedure with one of her clients in her role as a behavior technician. She reported no prior experience receiving feedback with a treatment fidelity form or completing one during an observation.

**Participant 1.** Participant 1 was a certified teacher with teaching experience in a classroom setting limited to only her student-teaching experience at the start of the study. She was also seeking supervised practicum experience to become a Board-Certified Behavior Analyst (BCBA). She recalled learning about Direct Instruction in undergraduate coursework and reported practicum experience with it in a preschool setting. She reported not having any prior experience receiving treatment-fidelity feedback on her implementation of Direct Instruction, but she had been exposed to treatment-fidelity forms and observations in her supervised practicum work.

**Participant 2.** Participant 2 was a first-year graduate student seeking coursework and practicum experience to become a Board-Certified Behavior Analyst (BCBA). She was not a certified teacher, but she did report more than two years of experience in applied behavior
analysis. She reported no prior experience receiving feedback with a treatment fidelity form or using fidelity forms during an observation.

**Participant 3.** Participant 3 was a first-year graduate student seeking coursework and practicum experience to become a Board-Certified Behavior Analyst (BCBA). She was not a certified teacher and she reported less than two years of experience in applied behavior analysis. She also reported no prior experience receiving feedback with a treatment fidelity form or using fidelity forms during an observation.

**Setting**

The study took place in a reading center and library room located at a midwestern university. The reading program served as a practicum site for undergraduate and graduate students in education and was housed in the special education program of the university. Inside the building, there was a lobby that had a small play area for children, four classrooms with both child sized and adult sized tables and chairs, white boards and cabinets for storage, a conference room with technology materials, a two-way observation room, a children’s library which had storage cubbies for students attached on the outside and a kitchenette located across from the library. All baseline and training phases of the experiment took place in three of the smaller classrooms or the library.

**Dependent Variables and Data Collection**

The two primary dependent variables for this study were rate of learn units and accuracy of learn units. Accuracy was comprised of both accurate delivery of antecedents as well as contingent consequences following the student response. A secondary dependent variable was rate of social praise and rate of token delivery, during the lesson, contingent on correct student
behavior prescribed by the rules established for the reading lesson. A description of each dependent variable and measurement system follows.

**Rate of learn units.** The first primary dependent variable was the rate of correct and incorrect learn units during an assigned reading lesson. An intact learn unit as defined for the current study includes an antecedent presented by the teacher, a student response, and a contingent consequence presented by the teacher. The rate of presenting learn units during instruction is a measure of an instructor’s use of instructional time. For instance, if a teacher presents 30 correct learn units in 10 minutes, the teacher has presented learn units at a rate of 3 correct learn units per minute. The TPRA was used to measure rate of learn units presented by the participant during each session. See Appendix C for an example of a TPRA observation form.

**Accuracy of learn units.** For the current study, an accurate learn unit was defined as the teacher’s correct delivery of the antecedent and the teacher’s correct delivery of a contingent consequence as prescribed by the reading curriculum procedure.

**Antecedences.** An antecedent is comprised of any written, vocal, or gestural instruction presented by the teacher as prescribed by the reading curriculum. These instructions may specify volume, sequence of presentation, or pronunciation of verbal stimuli designed to occasion a specific response by the student. A correct antecedent requires all components of the instruction be presented accurately as prescribed by the curriculum. The researcher recorded a (+) on the TPRA under ‘Teacher Antecedent’ column for a completely intact instruction. An incorrect antecedent was recorded as a (-) on the TPRA if any component of the instruction was missing or presenting incorrectly. See Appendix C for an example of a TRPA data sheet.
**Contingent consequences.** A contingent consequence is the presentation of a reinforcer or an error correction by the teacher after a student response. It is contingent on the student’s response to a teacher antecedent. For example, if a teacher said, “Tell me a word that rhymes with bat” and a student says “cat”, the teacher’s contingent consequence might be an approval of the student’s behavior with a praise statement, high five, or small reward. If the student says “bear”, then the teacher’s contingent consequence might be an error correction such as modeling the correct response and then presenting the antecedent again without praising the student’s behavior. In the current study, correct contingent reinforcement occurred if a teacher praised a student’s response within three seconds of a correct response; an R+ was recorded on the TPRA sheet. Incorrect contingent reinforcement occurred if a teacher omitted contingent reinforcement when a student had a correct response; an R- was recorded on the TPRA form. A correct correction occurred if a student responded incorrectly and a teacher: 1) modeled the correct response and 2) re-presented the antecedent completely; a C+ was recorded on the TPRA form. An incorrect correction occurred if a student responded incorrectly and a teacher did not perform an error correction procedure as previously described; a C- was recorded on the TPRA form.

**Rate of social praise/token delivery contingent on following reading rules.** A secondary dependent variable in this study was rate of social praise and token delivery contingent on student following the established rules for the reading lesson. Participants were given a list of four rules for good reading behavior that they were instructed to review with their student prior to beginning the assigned lesson. They were also instructed to deliver tokens throughout the lesson at their discretion when the student was following one or more of these rules. Additionally, they were instructed that these tokens were not intended to be delivered to
reinforce correct responses on lesson nor should they be given immediately following incorrect student responses. On the TPRA form, token delivery was recorded as a tally mark and totaled at the end of each lesson to determine the rate of social praise/token delivery for each lesson.

**Independent Variable**

The independent variable for this study was an intervention package of behavioral skills training (Parsons, Rollyson, & Reid, 2012) to train participants to use the TPRA for recording learn units and the subsequent practice and feedback by the participant’s conducting self-observations with TPRA. Participants were first presented the rationale and instructions for the TPRA, followed by a model of how to conduct an observation with TPRA on a confederate. For the practice and feedback portion of behavioral skills training, participants conducted self-observations using the TPRA to record accuracy and rate of learn units as well as the delivery of social praise/tokens during the reading lesson. Immediately following each observation session, the participant received feedback on their accurate recording on a TPRA form, but no specific feedback on the quality of instruction (i.e., rate of correct learn units) in the observed session. Table 1 briefly describes each component of the intervention package as a step of behavioral skills training.

**Self-observations.** The participant observed a recorded video of their own delivery of a Great Leaps lesson and simultaneously completed a TPRA observation form. They were not permitted to stop or rewind the video at any time to approximate observation conditions in a classroom or applied setting. At the termination of the lesson, the video was stopped, and the participant was permitted up to five minutes to complete the remainder of the TPRA form.

**Feedback on TPRA scoring.** Immediately following the self-observation, participants were given feedback on their accuracy in using the TPRA form. The researcher or research
assistant reviewed each learn unit with the participant and provided feedback in the form of verbal praise for accurately recorded learn units or specific feedback on errors. The participant could ask to review parts of the video at this time to see specifically where errors were made in recording on the TPRA. The researcher also reviewed the participants calculations of rate and gave specific feedback on errors in calculations (i.e., the participant did not correctly divide the number of correct learn units by the converted time to determine rate of correct learn units).

Table 1

Behavior Skills Training for Self-Observation with TPRA

<table>
<thead>
<tr>
<th>Behavior Skills Training (Parsons, Rollyson, &amp; Reid, 2012)</th>
<th>Description of intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions and Rationale for Skill</td>
<td>PowerPoint instructions and rationale for TPRA delivered by researcher (approximately one hour in length)</td>
</tr>
<tr>
<td>Model the Skill</td>
<td>Researcher and participant observe confederate teaching; researcher models TPRA completion</td>
</tr>
<tr>
<td>Practice the Skill</td>
<td>Participant conducts self-observation using the TPRA to record rate and accuracy of learn units</td>
</tr>
<tr>
<td>Feedback on the Skill</td>
<td>Researcher or research assistant gives structured feedback to the participant on accuracy of TPRA data immediately following observation</td>
</tr>
</tbody>
</table>

Social Validity

The four participants were asked to complete an anonymous, online post-experiment survey to assess their perceived benefits and weaknesses of the intervention as well as utility in their applied settings. Questions utilized a Likert scale from one to five followed by free-response answer where they were given the opportunity to explain or elaborate on their answers. One question was format as a “yes” or “no” responses followed by an opportunity for comments.
For the Likert responses the "1" represented "not at all" and "5" represented "very much". See Appendix H for example of the social validity survey.

Materials

Pre-baseline survey. Before the participants entered baseline, a survey was distributed to acquire information on their: 1) knowledge of direct instruction, 2) experience in applied behavior analysis and general education, 3) procedural integrity procedures and feedback, and 4) prior experience in reading instruction. See Appendix J for example of pre-baseline survey.

Training knowledge check. After participants were given instructions by the researcher on the delivery of “Rules for Reading Lessons”, token economy, and oriented to script of reading lesson format using materials provided by the curriculum book, a training knowledge check was administered. Participants were required to score a minimum of 80% on this knowledge check before the first session. The knowledge check asked the participant to identify key components of a unit of instruction (i.e., antecedent, behavior, and consequence). Additionally, the knowledge check required the participant to generate an example of praise a statement and identify an example of an incorrect student response. See Appendix E for example of Training Knowledge Checklist.

Token board and rules for reading lessons. Participants were given a blank token board and a typed list of rules for reading lessons to review with student prior to delivering each lesson. To begin each session with a child, participants were told to review the rules with the child and place the token board close to child so they may easily deliver tokens in the form of check marks or stars on board during the lesson.

Video camera and computer. A GoPro, iPad, and Mac computer were used to record sessions for scoring by research assistants as well as serve as the self-observation videos during
the intervention phase. Videos were viewed on the computer with audio from computer built-in speakers.

**TPRA form.** The TPRA form measured both intervention fidelity for the teacher (accuracy of presentations and consequences) and correct and incorrect responses for a student. It also provided spaces for the observer to record: 1) the total number of correct and incorrect learn units, 2) correct and incorrect student responses, 3) the duration of the lesson, 4) information about the observed teacher, student, and class (name, date, class), and 5) the rate of correct and incorrect learn units and correct and incorrect student responses. See Appendix C for example of TPRA form.

**Reading curricula.** Three reading instruction programs were used in this study including Great Leaps Reading Fluency program, Dolch Sight Words multiple exemplar training (MET) procedure, and Corrective Reading Programs (Campbell, 1995; Dolch, 1941; Engelmann et al., 1998). Table 2 summarizes how each of the three reading curricula were used in the study during baseline and intervention conditions.

**Great Leaps Reading Fluency Program.** The Great Leaps Reading Program (Campbell, 1995) is an evidence-based fluency program for students below a fifth-grade reading level ranging from ages five to eighteen years in age. Each lesson consists of scripted instructions for the teacher as well as prescribed responses for the student to emit orally based on the teacher’s instructions. Within the fluency program, lessons target segmenting and blending phonemes as well as identifying and generating rhyming words among other component skills for more advanced reading repertoires.

**Dolch Sight Words.** The Dolch Sight Words procedure was developed by the researcher as a multiple-exemplar procedure designed to target three sight words per lesson so that the
A student would engage in the responses of matching, pointing to, and labeling in a random order with a random sequence of the three stimuli. The target stimuli were based on the Dolch Sight Words list consisting of 220 words that a child should be able to recognize to achieve reading fluency (Dolch, 1948). Student participants were assessed using the Dolch Sight Words list to identify target words. For each session, participants were given a set of flash cards consisting of two cards per word, a data sheet, and a written description of the instructions and error correction procedure for each topography of responding including matching, pointing to, and labeling the word.

Corrective Reading Program. Corrective Reading (CR) Programs (Engelmann et al., 1998) are a series of scripted Direct Instruction curricula for older children, adolescents, and adults. Each student is pre-tested and then placed at their appropriate instructional level. The teacher reads the script and then observes the student’s responses to determine the accuracy and mastery of content based. The teacher progresses through the script in this manner until the student finishes one level of the curriculum; the student then proceeds to the next level of the curriculum. Throughout the curriculum, the amount of instruction varies based on the needs of the student. Therefore, students who need more practice can review skills while students who are making progress can proceed to a more advanced lesson.
Table 2

Reading Curricula and Purpose in Study

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Leaps Reading Fluency (Campbell, 1995)</td>
<td>Baseline and self-observation intervention curriculum</td>
</tr>
<tr>
<td>Corrective Reading Program (Engelmann et al., 1998)</td>
<td>Baseline and generalization curriculum</td>
</tr>
<tr>
<td>Dolch Sight Words (Dolch, 1948) Multiple Exemplar Training</td>
<td>Baseline and generalization curriculum</td>
</tr>
</tbody>
</table>

Experimental Design

This study employed a multiple probe across participants design (Horner & Baer, 1978). A multiple probe design is based on the logic of a multiple baseline design (e.g., each participant serves as their own control and as a control for other participants) but is an alternative to continuous baseline measurement when continuous measurement is not practical (Horner & Baer, 1978) or when it may result in practice effects for a participant. In the current study, participants proceeded through the baseline phase followed by the video observation with TPRA and feedback phase. Intermittent probes of participants’ implementation of unobserved Direct Instruction curricula were conducted during baseline and intervention phases.

Procedure

Pre-baseline. All participants were given a brief introduction to the history of Direct Instruction (DI), the key components of a DI lesson (i.e., scripted instructions, high rate of active student responding, basic skills building into more complex repertoires), and a short introduction to the prerequisite knowledge on sound presentation in reading lessons (i.e., the letter ‘S’ is pronounced “sss” as in sat). After a brief introduction to Direct Instruction reading curricula,
each participant was administered a Training Knowledge Check quiz (See Appendix E for Training Knowledge Check). Participants had to score a minimum of 80% on this knowledge check before their first session.

**Baseline.** The purpose of the pre-baseline phase was to introduce participants to the general sequence of reading curricula and ensure a very basic understanding of the principles of behavior. In baseline, the researcher gave the participants the curricula teacher’s manual with specific pages for review marked in the manual. The researcher reviewed each of the marked pages by reading through them, as the participants followed along, and then asked if they has questions. Selected pages provided the purpose and rationale of Direct Instruction and steps to implement the curriculum. After the training, the participant delivered a lesson in a one-on-one structure to a student. Participants’ rates and accuracy of correct and incorrect learn units and the number of correct and incorrect contingent consequences were measured. No feedback was given to the participant on rate or accuracy of instruction.

**TPRA instructions and model phase.** The first phase of the intervention for all participants was the initial training on the TPRA form. Using a behavioral skills training (BST) (Parsons, Rollyson, & Reid, 2012), the researcher provided a rationale and instructions for the TPRA to measure learn units in academic instruction. BST is an evidence-based approach to training staff using traditional didactic instruction as well as systematic modeling and feedback on target skill or skills. The sequence of training steps in a behavioral skills training protocol include first describing the target skill and providing a clear description of the skill as it should be performed in the workplace. Next, the trainer demonstrates the target skill before requiring the trainee to practice the skill with feedback until a mastery criterion has been met (Parsons, Rollyson, & Reid, 2012). The first two steps of BST, rationale and instructions, were delivered
using a PowerPoint presentation and blank copy of the TPRA form for the participant to reference. The third step of BST is to model the behavior for the trainee. The model phase involved both the researcher and participant observing a model (research assistant) teaching a lesson. After completion, the researcher reviewed their data with the participant for each learn unit specifying rationale for any data points that did not match those recorded by the participant. The researcher then modeled how to calculate the converted time as well as correct and incorrect learn units per minute and rate of specific praise for the lesson.

**Self-observation with TPRA.** The purpose of this phase was to assess the effects of the video and TPRA on the teachers’ rates and accuracy of learn-unit presentations and their presentations of contingent consequences. To begin each session, the researcher or research assistant prepared a video of the participants’ delivery of a reading instruction from a previous session. The videos ranged from five to fifteen minutes and ranged from ten to twenty learn units. The video was played on a laptop computer or iPad with speakers housed inside the device. The researcher or research assistant delivered the script: “Today you will be observing a pre-recorded video of yourself delivering a lesson. During the observation, please complete this TPRA observation form to the best of your ability. I cannot pause or rewind the video during the observation so take a moment to fill out the top portion of the form now.” The participant was given a blank TPRA form and up to five minutes to review and prepare for the observation. If they had questions, they were permitted to review slides from the training PowerPoint on the TPRA form. The researcher then played the video and, along with the participant, filled out a TPRA form on their instruction. For consistency, the researcher shared their start and end time with the participant since it was a pre-recorded video.
Upon completion of the video observation, the participant was given up to five minutes to complete the post-observation counts and calculations on the TPRA. The participant was permitted to use a calculator for this part of the observation. After completion, the researcher reviewed the form with the participant and provided immediate feedback on errors in recording. This was completed by having the participant read each learn unit individually indicating the accuracy of the antecedent, student behavior, consequence, and presence or absence of token delivery. An example of this for one learn unit may be: “I recorded correct for teacher antecedent, an incorrect for student behavior, and C+ for teacher consequence. I marked it as a correct learn unit and a token was delivered for good speaker voice.” For a completely accurate row, the researcher confirmed accuracy and offered a praise statement. If any part of the learn unit scoring was an error or differed from the researcher’s data, feedback was immediately offered. In the case of a discrepancy, the video could be reviewed for that particular learn unit. After reviewing all learn units for the lesson, the researcher reviewed the calculations with the participant to ensure that steps were completed accurately. If errors were made, feedback was given immediately. The participants were not permitted to alter any data on the form during this review. Before delivering a lesson, the researcher stated, “Please summarize briefly for me some of the strengths and areas for improvement in the delivery of this lesson from your observation. You can specifically walk me through feedback you would provide using the TPRA form or simply state more broad observations.” The researcher recorded these notes but did not offer any specific feedback on the quality or accuracy of the participant’s summary of their strengths and weaknesses. Following each observation, the participant immediately delivered a lesson to a student or confederate. The participants’ rate and accuracy of correct and incorrect learn units,
and the number of correct and incorrect contingent consequences, were measured. No feedback was given to the participant on rate or accuracy of instruction.

**Pre- and Post- Intervention Alternate Reading Curricula**

During baseline, participants were trained on three different reading curricula to teach fluency, sight words, and early decoding skills at the reading level of the two confederate students. Each curriculum was introduced with a short rationale followed by instructions accompanying the written procedure (i.e., the teacher’s manual). The researcher oriented the participant to the relevant page or pages of the lesson and used the first learn unit of the lesson to model how the lesson should be delivered based on written materials. The participant was given up to 7 minutes to read through the script, rehearse, refer back to the written manual, and begin the lesson. During instruction, they had access to the written instructions as well as a pronunciation guide, if appropriate, for targeted sound and sound combinations in the lesson.

**Mastery and Termination Criteria**

The mastery criterion during intervention was 90% or greater accuracy recording learn units on TPRA forms during self-observations across two consecutive sessions with a minimum of 4 sessions. The termination criterion was after seven observations, if the final session was below 90% accuracy recording learn units on the TPRA form during self-observation.

**Intervention Integrity**

For each scheduled intervention session of self-observation with TPRA, the researcher or research assistant scored the session on three criteria. The first criterion required that the participant complete the observation when scheduled to occur and indicate accurate date and observation details (i.e., lesson and student) on the top of the form. The second criterion required that the participant collect data for at least five complete learn units on the TPRA data sheet. The
third criterion required that the participate calculate the correct per minute (CPM) and incorrect per minute (ICPM) in the Teacher Performance box on the TPRA. If any of these three criteria were not met, the researcher would record “no” for intervention integrity for that session. All of the intervention sessions scored at 100% for intervention integrity.

Social Validity and Debrief

Social validity measures of participants’ perceptions of the usefulness of the curriculum and the training was conducted at the end of a study. A debrief session was held at the end of the study with each participant to deliver the gift card contingent on completing the study, describe in more detail the purpose of the study, and briefly discuss the findings and review individual graphs with each of the participants.

Interobserver Agreement

25% of Great Leaps sessions scored by the researcher or research assistant were also scored by another trained research assistant. The average interobserver agreement (IOA) was 95% (range, 80% to 100%).

RESULTS

Accuracy of Learn Units

Pilot participant. Figure 1 displays the percentage correct learn units Pilot participant presented accurately during baseline and self-observation intervention sessions. Overall, results indicated that self-observation with TPRA slightly improved the accuracy of learn unit delivery for Pilot participant. During baseline, Pilot participant had a median of 89.5% accuracy of learn units (range, 80% to 100%). During self-observation, she had a median of 92% accuracy of learn units during the (range, 58% to 100%). Figure 3 displays the percentage correct for antecedents and consequences for Pilot participant during baseline and intervention.
**Participant 1.** Figure 2 displays the percentage correct learn units Participant 1 presented during baseline and self-observation intervention sessions. Overall, results indicated that self-observation using TPRA increased the accuracy of learn unit delivery for Participant 1. During baseline, Participant 1 had a median of 67.5% accuracy of learn units (range, 42% to 93%). During self-observation, she had a median of 91.5% accuracy of learn units during the (range, 67% to 100%). Participant 1’s presentation of consequences improved more following the intervention than her presentation of antecedents. Figure 4 displays the percentage correct for antecedents and consequences for Participant 1 during baseline and intervention.

**Participant 2.** Figure 2 displays the percentage correct learn units Participant 2 presented during baseline and self-observation intervention sessions. Overall, results indicated that self-observations with TPRA increased the accuracy of learn units delivery for Participant 2. During baseline, Participant 2 had a median of 86.5% accuracy of learn units (range, 56% to 100%). During self-observation, she had a median of 96.5% accuracy of learn units during the (range, 90% to 100%). Participant 2’s presentation of consequences improved more following the intervention than her presentation of antecedents. Figure 4 displays the percentage correct for antecedents and consequences for Participant 2 during baseline and intervention.

**Participant 3.** Figure 2 displays the percentage correct learn units Participant 3 presented during baseline and self-observation intervention sessions. Overall, results indicated that self-observations with TPRA increased the accuracy of learn unit delivery for Participant 3. During baseline, Participant 3 had a median of 40% accuracy of learn units (range, 0% to 100%). During self-observation, she had a median of 100% accuracy of learn units during the (range, 93% to 100%). Participant 3’s presentation of consequences improved more following the intervention than her presentation of antecedents. Figure 4 displays the percentage correct for antecedents.
and consequences for Participant 3 during baseline and intervention. Table 3 summarizes the
median accuracy of antecedences and consequences for all participants.

![Graph](image)

Figure 1: *Baseline and Intervention Accuracy of Learn Units for Pilot Participant.* This figure
presents the percentage correct learn units for baseline sessions and intervention sessions
following self-observation with TPRA.
Figure 2: Multiple Baseline of Percentage Correct Learn Units. This figure presents the percentage correct learn units in baseline sessions and intervention sessions following self-observation with TPRA for Participants 1, 2, and 3.
Figure 3: Accuracy of Antecedents, Consequences, and Learn Units for Pilot Participant. This figure shows the percentage of antecedents and contingent consequences accurately presented during each session that comprise a complete learn unit. Sessions 1 through 4 represent baseline sessions and sessions 6 through 11 represent interventions sessions.

Table 3

Median Accuracy of Antecedents, Consequences, and Learn Units

<table>
<thead>
<tr>
<th>Pilot Participant</th>
<th>Baseline</th>
<th>Self-Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedents</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Consequences</td>
<td>89.5</td>
<td>100</td>
</tr>
<tr>
<td>Learn units</td>
<td>89.5</td>
<td>92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant 1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedents</td>
<td>96.5</td>
<td>96.5</td>
</tr>
<tr>
<td>Consequences</td>
<td>71</td>
<td>100</td>
</tr>
<tr>
<td>Learn units</td>
<td>67.5</td>
<td>91.5</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Participant 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedents</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Consequences</td>
<td>93</td>
<td>96.5</td>
</tr>
<tr>
<td>Learn units</td>
<td>86.5</td>
<td>96.5</td>
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<thead>
<tr>
<th>Participant 3</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedents</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Consequences</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Learn units</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>
Figure 4: Multiple Baseline of Accurate Antecedents and Consequences. This figure shows the percentage correct of antecedents and contingent consequences presented by Participants 1, 2, and 3 during baseline and intervention sessions.
Rate of Learn Units

**Pilot participant.** Figure 5 displays the rate of correct and incorrect learn units the pilot participant performed during baseline and the self-observation intervention sessions. Overall, results indicated that self-observations using the TPRA only slightly increased the rate of correct learn units and decreased the rate of incorrect learn units for Pilot participant. During baseline lessons, she had a median of 3.19 correct learn units per minute (range, 2.06 to 7.81) and a median of 0.38 incorrect learn units per minute (range, 0 to 0.58). During self-observation intervention sessions, she had a median of 3.66 correct learn units per minute (range, 1.14 to 4.62) and a median of 0.13 incorrect learn units per minute (range, 0 to 1.34).

**Participant 1.** Figure 6 shows the rate of correct and incorrect learn units Participant 1 obtained during baseline and self-observation intervention sessions. Results indicated that self-observations with TPRA increased the rate of correct learn units and decreased the rate of incorrect learn units for Participant 1. During baseline lessons, she had a median of 2.51 correct learn units per minute (range, 1.26 to 3.76) and a median of 1.02 incorrect learn units per minute (range, 0.27 to 1.76). During self-observation intervention sessions, she had a median of 3.04 correct learn units per minute (range, 1.68 to 4.13) and a median of 0.27 incorrect learn units per minute (range, 0 to 1.01).

**Participant 2.** Figure 6 displays the rate of correct and incorrect learn units Participant 2 presented during baseline and self-observation intervention sessions. Results indicated that self-observations with TPRA increased the rate of correct learn units and decreased the rate of incorrect learn units for Participant 2. During baseline lessons, Participant 2 had a median of 2.34 correct learn units per minute (range, 1.99 to 6.67) and a median of 0.36 incorrect learn units per minute (range, 0 to 1.61). During self-observation intervention sessions, she had a median of
2.81 correct learn units per minute (range, 1.86 to 3.38) and a median of 0.11 incorrect learn units per minute (range, 0 to 0.24).

**Participant 3.** Figure 6 displays the rate of correct and incorrect learn units Participant 3 presented during baseline and self-observation intervention sessions. Overall, results indicated that the self-observation with TPRA increased the rate of correct learn units and decreased the rate of incorrect learn units for Participant 3. During baseline lessons, Participant 3 had a median of 1.01 correct learn units per minute (range, 0 to 3.43) and a median of 1.51 incorrect learn units per minute (range, 0 to 4.44). During self-observation intervention sessions, she had a median of 5.70 correct learn units per minute (range, 4.03 to 6.22) and a median of zero incorrect learn units per minute (range, 0 to 0.44).

![Figure 5: Rate of Learn Units for Pilot Participant. This figure shows the rate of learn correct and incorrect learn units per minute presented by the pilot participant during baseline and following self-observation with TPRA sessions.](image-url)
Figure 6: Multiple Baseline for Rate of Learn Units. This figure shows the rate of correct and incorrect learn units presented per minute by Participants 1, 2, and 3 during baseline and self-observation with TPRA sessions.
Rate of Praise/Token Delivery

**Pilot participant.** During baseline lessons, the pilot participant delivered a median of 0.78 praise statements (for following the rules of reading lessons) accompanied by tokens per minute (range, 0.47 to 1.04). She had a median of 0.81 praise and token deliveries per minute during the self-observation with TPRA phase of the study (range, 0.32 to 1.57).

**Participant 1.** During baseline lessons, Participant 1 delivered a median of 0.79 praise statements (for following the rules of reading lessons) accompanied by tokens per minute (range, 0.50 to 1.08). She had a median of 1.60 praise and token deliveries per minute during the self-observation with TPRA phase of the study (range, 1.01 to 1.70).

**Participant 2.** During baseline lessons, Participant 2 delivered a median of 0.35 praise statements (for following the rules of reading lessons) accompanied by tokens per minute (range, 0 to 0.53). She had a median of 0.90 praise and token deliveries per minute during the self-observation with TPRA phase of the study (range, 0.73 to 0.97).

**Participant 3.** During baseline lessons, Participant 3 delivered a median of 0.34 praise statements (for following the rules of reading lessons) accompanied by tokens per minute (range, 0 to 0.49). She had a median of 0.88 praise and token deliveries per minute during the self-observation with TPRA phase of the study (range, 0.38 to 1.55).

TPRA Observation Accuracy

The Pilot participant did not meet mastery criterion for accurately recording learn units on the TPRA during self-observation sessions. Participant 1 met mastery criterion after four sessions of self-observation with the TPRA. Participant 2 met mastery criterion after four sessions of self-observations with TPRA. Participant 3 met mastery criterion after five sessions of self-observations with TPRA. Although Participant 3 scored 87% accuracy in her final
observation session, which falls below the criterion of 90%, the feedback phase of this session revealed that the participant would have caught an unintentional error in data collection when scoring and thus the session was deemed still qualified to fulfill the mastery criterion requirement. Figure 7 displays the accuracy of TPRA scoring for the Pilot participant and Figure 8 displays the accuracy of TPRA scoring for Participants 1, 2, and 3.

**Figure 7:** Accuracy of TPRA Scoring for Pilot Participant. This figure shows the accuracy of learn units recorded by the pilot participant on the TPRA during self-observations. The dotted line at 90 percent correct is the goal line for the mastery criterion of two consecutive sessions at 90 percent.

**Figure 8:** Accuracy of TPRA Scoring for Participants 1, 2, and 3. This figure shows the accuracy of learn units recorded by participants 1, 2, and 3 on the TPRA during self-observations. The dotted line at 90 percent correct is the goal line for the mastery criterion of two consecutive sessions at 90 percent. Participant 3 scored an 87 percent on the final observation but met mastery criterion as she detected her own error in recording before receiving structured feedback from researcher.
TPRA Observation Open-Ended Responses

Following each self-observation and prior to the participant delivering a reading session, the researcher asked the participant to summarize briefly some of the strengths and areas for improvement in the delivery of this lesson from the observation. Pilot participant detected weaknesses in instruction including low volume of voice, lack of enthusiastic praise, and pronunciation while detecting strengths in eye contact and error correction procedure. Participant 1 reported weakness including errors in delivery of antecedent and strengths in improving antecedent delivery as well as error correction in subsequent self-observations. Participant 2 detected a weakness of failing to provide consistent or frequent tokens for good reading behavior but offered strengths in her self-observations of strong praise and corrections contingent on student behavior. Participant 3 reported weaknesses including error correction implementation and pacing while noting strengths in reinforcement and improving error correction implementation.

Intervention Acceptability

When asked if they liked watching videos of their own implementation of procedures, most participants responded indicating that they very much liked watching these videos while one participant indicated very much disliking self-observations. When asked to comment on this negative response, the participant elaborated that it was simply aversive to watch herself on a video recording. However, all participants indicated that they felt they benefited from watching videos of their own instruction and scoring learn units using the TPRA (all participants scored 4 or higher for this survey question on a scale of 1-5). When asked to comment on these responses, participants indicated that they felt this was productive in identifying what was correct and incorrect in their own instruction. When asked if they thought they would use the TPRA in their
current teaching or training setting, all participants responded affirmatively with the exception of one participant who is not currently working in a teaching or training site. Responses ranged from moderately confident to very confident when asked to reflect on whether they would feel comfortable training a peer to use the TPRA to measure rate and accuracy. Overall, open-ended feedback was very positive about the research experience and reflected that they felt the intervention was beneficial in improving their quality of teaching behavior.

**Generalization Probes**

Table 4 displays the rate and accuracy of learn units on reading curricula that served as generalization probes. Figures 9 and 10 show the accuracy and rate of correct learn units presented by participants using the Dolch Words procedure during baseline and post-intervention sessions, respectively. Two of four participants improved in accuracy of learn units and three of the four participants increased in rate of correct learn units. Figures 11 and 12 show the accuracy and rate of correct learn units presented by participants using the Corrective Reading Program during baseline and post-intervention sessions, respectively. Three of four participants improved in accuracy of learn units and two of four participants increased in rate of correct learn units. Generally, the intervention did not show as positive of improvement for rate or accuracy of curricula that was not targeted with self-observation using TRPA intervention.
Table 4

Rate and Accuracy of Learn Units for Generalization Curricula

<table>
<thead>
<tr>
<th></th>
<th>Dolch words</th>
<th>Corrective reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Intervention</td>
</tr>
<tr>
<td>Pilot Participant</td>
<td></td>
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<tr>
<td>Rate</td>
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<td>Accuracy</td>
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<tr>
<td>Rate</td>
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<tr>
<td>Accuracy</td>
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<td>100</td>
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<tr>
<td>Rate</td>
<td>3.22</td>
<td>3.18</td>
</tr>
<tr>
<td>Accuracy</td>
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<td>89</td>
</tr>
<tr>
<td>Participant 3</td>
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<td></td>
</tr>
<tr>
<td>Rate</td>
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<td>4.92</td>
</tr>
<tr>
<td>Accuracy</td>
<td>41.75</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 9: Accuracy of Learn Units for the Dolch Words Procedure. This figure shows the percentage correct for the Dolch Words procedure learn units presented by each participant in baseline session and following intervention.
Figure 10: Rate of Correct Learn Units for the Dolch Words Procedure. This figure shows the rate of correct learn units for participants during baseline and post-intervention implementation of the Dolch Words procedure.

Figure 11: Accuracy of Learn Units for the Corrective Reading Program. This figure shows the percentage correct for the Corrective Reading Program procedure learn units presented by each participant in baseline session and following intervention.
Figure 12: Rate of Correct Learn Units for the Corrective Reading Program. This figure shows the rate of correct learn units for participants during baseline and post-intervention implementation of the Corrective Reading Program.

DISCUSSION

Overview

This study sought to evaluate the impact of structured self-observations using the TPRA to record rate and accuracy of learn units on an observing teacher’s implementation integrity of reading curricula. Four graduate student participants were trained to implement reading curricula using instruction, modeling, and access to the prescribed written instructions accompanying each of the reading curricula. The dependent variables were the accuracy and rate of antecedents, consequences, and total learn units for the lesson. A secondary dependent variable was the rate of social praise and token delivery contingent on student behavior during the lesson aligned with the four rules established each session. During intervention, participants were trained to record learn units using the Teacher Performance Rate and Accuracy Scale (TPRA) and observed videos of their own reading sessions to score accuracy and rate of learn unit delivery. Results suggest that structured self-observations of learn units improved the accuracy of consequences
and total learn units as all four participants showed a higher median accuracy of consequences in intervention than baseline, with two participants showing greater improvement during the intervention. The rate of correct learn units also improved for all participants during self-observation intervention, however the changes in rate were variable with only one participant showing immediate and consistent improvement in rate of correct learn units during intervention.

**Major Findings**

**Learn unit accuracy compared to baseline.** The percentage correct of learn units for a reading lesson delivered during baseline compared to intervention sessions increased for all four participants. For the participant who did not meet mastery criterion using the TPRA during intervention, the percentage correct learn units improved only slightly from baseline to intervention. Because of the amount of variability during baseline for Participants 1 and 2, Participant 3 is the only one who showed a clear change from baseline to intervention conditions.

**Learn unit rate compared to baseline.** The median rate of correct learn units increased for all participants, with variability, from baseline to intervention with self-observations using TPRA. Rate of correct learn units was on an increasing trend for one of the participants who did not show as much improvement in rate of correct learn units during intervention. The median rate of incorrect learn units decreased for all participants from baseline to intervention with self-observations, but some of the effects were much smaller on rate of incorrect learn units.

**Generalization to untrained curricula.** The results when comparing pre- to post-intervention sessions of untrained curricula, including Dolch Words and Corrective Reading, varied significantly for participants. Thus, the results did not suggest that the intervention was effective in changing overall accuracy and rate of learn unit delivery for untrained curricula after intervention with self-observation and scoring using TPRA on a different reading curriculum.
Relationship Between the Current Findings and Previous Research

**Extension of previous research using TPRA observations.** Previous research has demonstrated the efficacy of TPRA feedback on improving teacher’s rate and accuracy of learn unit delivery. Ingram and Greer (1992) found a functional relationship between teacher’s receiving feedback following higher rate and accuracy recorded on the TPRA and correct student responses as compared to nonspecific feedback. Additionally, Sarto (2017) extended existing research supporting feedback using the TPRA to improve performance by examining the effects on the observer’s behavior when using the TPRA during structured observations. Her findings suggest that self-observations of learn unit instruction were more effective in changing subsequent rate and accuracy of learn unit delivery than observation of a confederate.

The current study extends this research into other areas of curricula and target populations. Sarto (2017) implemented research with participants using verbal behavior curriculum ranging from pre-listener to advanced listener and speaker skills. Additionally, the students in her study were children with autism or other developmental disabilities. Because self-observations were shown to be more effective in previous work, the current study examined self-observations using reading curricula when working with children who do not have disabilities. These findings extend the existing research into alternative applications in schools and classrooms for various populations and subject areas.

**Extension of previous research on observations and behavior change.** Previous research aimed at improving staff adherence to safety behavior in the workplace suggested that observing the behavior of others and taking data on their occurrence or non-occurrence of trained behaviors may effectively change the behavior of the observer (Sasson and Austin, 2005; Alvero, Rost, & Austin, 2008). In an academic setting, previous research has supported the efficacy of
structured self-observations to detect components of learn units (Bishop, Snyder, & Crow, 2015) and suggest that self-observations with TPRA are more effective in improving rate and accuracy than observation of a confederate with TPRA (Sarto, 2017).

The current study extends previous research on observations and behavior change by adding further evidence that structured self-observations with TPRA may be effective, for some teachers, in improving their subsequent rate and accuracy of instruction without additional direct feedback. Three of the four participants were able to meet mastery criterion of accurately using the observation tool to record learn units without extensive training or feedback. This suggests that self-observations with TPRA may be beneficial in contexts with limited resources for training and in-vivo supervision.

Anecdotal Findings

Personal experiences of participants. While participating in the study, all participants were concurrently enrolled full-time in graduate coursework and some of the participants were also working part-time jobs. While anecdotal, it is relevant to note that personal life experiences and stressors may have impacted intervention sessions for participants. The Pilot participant experienced several significant personal life experiences disclosed during the study that very likely created stress and distractibility. Both the researcher and research assistant noted slower pacing and much quieter tone of voice as well as very little enthusiasm during research sessions following these life events. The participant was encouraged by the researcher to prioritize her mental health and time with family to seek and provide support, but the participant was adamant about continuing in the study and did meet all criteria for completing sessions based on our integrity checklist. However, it is possible that this participant failed to make as much progress during intervention phases as the other participants due to these concurrent personal experiences.
**Conducting self-observations.** More than half of the participants, during the course of intervention sessions, indicated having some type of adverse reaction or displeasure watching themselves on camera. When asked at the end of each video session to offer open-ended feedback on strengths and weaknesses of their own instruction in the video as if giving feedback to another teacher, the types of responses varied and may have been correlated with the subsequent changes in behavior of the participant when delivering the next reading lesson. For example, Pilot participant reported deficits in tone or volume of voice and strengths in eye contact. While these may be relevant behaviors to effective instruction, they are not relevant variables detected using the TPRA. In contrast, Participant 3 narrated feedback relevant to her delivery of error correction and pace of instruction. Prior research on observer effect has suggested a correlation between the accuracy of the observer’s recording of behavior and subsequent engagement in the correct target behavior following observation (Sasson & Austin, 2005). The current study does not have sufficient data on this feedback and subsequent behavior to establish a relationship between the two variables, but it is a notable finding that some participants were more apt to give feedback on accuracy and rate following self-observation with TPRA than other participants.

**Child Outcomes in Reading Instruction.** The children who received reading intervention in the study were recruited based on prior participation in affiliated reading programs, research projects, or parent interest in additional reading instruction opportunities. While student reading assessment scores were not used as a dependent variable in this study, due to the fact that they were attending sessions with varying intensity and received instruction from multiple participants throughout the study, it should be noted that the students reading repertoires were assessed at the beginning of the study using the Great Leaps placement activities and Dolch
Sight Words. Sessions were scheduled two to three days per week during which students would receive instruction from multiple participants and research assistants during 50-minute reading groups. For participant sessions, students worked one-on-one in small classrooms. Between sessions, students engaged with research assistants and reading activities including a computer-based reading program, a selection of books in the library, activity worksheets, sight word games, and other age-appropriate reading activities. At the end of each daily session, students could select prizes using points earned during sessions. Anecdotally, the children enjoyed working with participants and were motivated to earn points during sessions that could be exchanged later for small prizes. After sessions, students were usually eager to report to the researcher what they had done (i.e., picked out rhyming words, matched sight words) were their teacher and report how many tokens they had received.

**Social validity.** The anonymous survey conducted at the end of the study solicited open-ended feedback as well as ratings from participants on their experience in the study. Graphs of the data from this survey can be found in Appendix I. Open-ended responses were generally positive in describing their experience in the study. For example, participants reported that they would love to use the TPRA in their applied setting and one participant elaborated indicated that it was easy form to use as well as informative in giving feedback to teachers. When given the option to offer additional comments at the end of the survey, two of the four participants indicated that it was a beneficial learning experience.

**The Implications of this Study on Schools and Teacher Training**

For schools using Direct Instruction or other evidence-based reading curricula to teach students with or without disabilities, this intervention could offer a cost-effective means to improve accuracy and rate or instruction without the need for direct feedback. However, the
findings suggest that some, but not all, participants improved significantly in rate and accuracy following intervention. Thus, these findings should not be interpreted as suggesting an approach that can replace direct observation, modeling, and feedback. Further research is necessary to identify how direct observation and feedback may be used in combination with structured self-observations of learn units to improve overall teacher performance.

In the current study, the initial intervention training phases required about one hour for instruction and an additional hour for modeling and feedback of the TPRA prior to beginning self-observations sessions. These two hours could fairly easily be incorporated into a school’s professional development program at the beginning of the school year. A notable benefit of using the TPRA in place of other curriculum-specific fidelity forms is that it can be used with a variety of instructional material to capture accuracy and rate of instruction. Therefore, once a teacher has been trained on how to record antecedents, student behavior, and consequences correctly, they are more equipped to monitor performance of various types of instruction. These observations could quite easily be incorporated into already existing mentor models of training and feedback such as professional learning communities or instructional coaching sessions.

With such strong evidence supporting the critical need for effective reading instruction before the third grade (Hernandez, 2011) and the vast number of students in schools in America who are underperforming in reading (U.S. Department of Education, 2019), it is of great value to consider strategies to ensure that students are not only accessing evidence-based reading instruction but that teachers are delivering this instruction at a high rate and with high fidelity. If accuracy or rate of instruction is compromised, the ability of a student falling behind in reading to catch up with peers is compromised. This research could be beneficial in supporting schools
and teachers to offer higher-quality classroom instruction in reading without requiring a high investment of time and resources that often are not readily available in public education.

**Limitations**

A limitation of this study was the inability to control for the external variables, aside from the teacher’s instruction, that may have impacted the rate of learn units. For example, variability in student responding such as high rates of errors emitted or off-task behavior could have significantly impacted the rate of instruction for a particular lesson. In addition, different response topographies and lengths dictated by the curriculum and embedding praise might affect rate of lessons. While participants were told to review reading rules with students before each lesson including the expectations to stay in seat, try your hardest, speak loudly when reading, and raise hand if they need to speak during the lesson, there were occasional disruptions created by students between learn units or during token delivery. Additionally, participants were instructed to use the token board to reinforce following the rules and they were given permission to have students hold all questions and other off-task discussion to the end of the lesson. However, it is possible that changes in rate of learn unit delivery from one lesson to the next could have been attributed to changes in the student’s behavior as well as changes in the participant’s delivery of instruction.

Another limitation of the study was the use of only one reading curriculum during self-observations and intervention sessions. While the participants were trained on four different reading curricula during baseline and ran sessions with all curricular programs, the self-observations and intervention sessions were limited to Great Leaps curriculum for experimental control. For student reading instruction during baseline, the participants ran concurrent sessions
of other trained reading curricula that may have impacted baseline rate and accuracy on Great Leaps sessions.

Another limitation of the current study was the scoring criterion for accuracy of TPRA use during self-observations. Participants were given the start and end time of the session since it was pre-recorded. Additionally, they were only observing the teacher with one student receiving instruction and no other students present in the room or other distracting events. Lastly, while the researcher or research assistant gave verbal feedback on accuracy of completing the entire form, scoring for TPRA accuracy was based entirely on recording of learn units and token delivery during the lesson. The restricted criterion may limit the possible generalization of these results to in-vivo observation sessions and require further research to better represent accuracy of TPRA scoring by participants on timing and calculating overall rate and accuracy of learn units.

Future Research

Future research extending the findings of the current study on self-observations using the TPRA could examine this intervention with different subject areas. The current experiment only investigated the effects on reading instruction curricula. However, for utility in an education setting, it would be beneficial to replicate this study in other critical subject areas including math and writing. Additionally, this intervention could also be replicated using teachers working with different populations of students. The current study examined self-observation using TPRA to score learn units when working with children who did not have a diagnosed learning disability and spoke English as their first language. A follow-up study could apply this same intervention to support students with developmental disabilities or English-language learners. In these proposed replications of the current study, it would be useful to work in a classroom setting with
consistent intervention for the same group of students allowing for student outcomes to be a secondary dependent variable.

Future research is needed to identify how self-observations could be used as a treatment package with direct observations and feedback. It is possible that some individuals could achieve high rates and accuracy with observation of a model video or training session that is less intensive than the proposed structured self-observations. To develop a training and feedback system for schools, it would be most beneficial to examine how teachers could be offered tiered supports determined by their specific needs or deficits in delivering instructional material.

Another valuable extension of the current study as well as the study conducted by Yuan, Lee, and Kimmel (2018) would be in self-observation of learn units to improve intervention integrity should focus on parent and caregiver training. Technology advancements have drastically improved access to in-home services and remote services for families with children receiving adaptive behavioral services, but resources for extensive supervision and coaching for parents working with their children outside of a clinical or school setting is still limited. Using the low-resource technology of videotaping sessions and scoring with the TPRA, parents and caregivers could potentially benefit from this intervention to improve evidence-based practices in in-home programming.

**CONCLUSION**

The current study provides evidence that self-observation can be effective for some teachers to improve rate and accuracy of learn unit delivery. However, findings also suggest that structured self-observation with TPRA to score rate and accuracy of learn units is insufficient for all teachers to achieve high rates of instruction and improve accuracy of delivering antecedents and consequences. It is possible that self-observations with TPRA could be most effective when
used in conjunction with direct observation and feedback from a supervisor, but more research is necessary to better understand this treatment package. The current study adds to the existing literature suggesting that self-observation can be effective for some teachers to detect errors in their instruction and improve adherence to behavior-based teaching strategies that can improve student outcomes.
REFERENCES


Appendix A

HSIRB Approval
Date: July 23, 2019

To: Denise Ross, Principal Investigator
Mya Hernandez, Student Investigator for dissertation
Katherine Mahaffy, Student Investigator for dissertation
Student Investigators: Ariana McClellan, Brandi Fontenot, Michael Jones,
Margaret Uwayo, Garrett Warrillow

From: Amy Naugle, Ph.D., Chair

Re: IRB Project Number 15-05-04

This letter will serve as confirmation that the changes to your research project titled
"Establishing the Literacy Skills of Students with Reading Delays" requested in your memo
received July 17, 2019 (to add video and/or audio recording; to expand dissemination to include
use of data for Mya Hernandez’s and Katherine Mahaffy’s dissertations; to revise consent
documents to reflect these changes) have been approved by the Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western
Michigan University.

Please note that you may only conduct this research exactly in the form it was approved. You
must seek specific board approval for any changes in this project. You must also seek reapproval
if the project extends beyond the termination date noted below. In addition, if there are any
unanticipated adverse reactions or unanticipated events associated with the conduct of this
research, you should immediately suspend the project and contact the Chair of the IRB for
consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: June 14, 2020
Appendix B

Procedural Checklists and Treatment Fidelity Procedure
Procedure: Behavior Skills Training TPRA

Setting: Small room with table and chairs in reading center

Materials:
- TPRA Training PPT (on computer)
- Blank TPRA forms

**TPRA Behavior Skills Training Task Analysis and Probes**

General introduction:
Say “The purpose of today’s training is to introduce you to an observation tool that eventually you will be using as part of this study. Before we practice using the tool, I want to share with you the rationale for a behavior-based observation tool and introduce you to the components of it.”

Step 1: Rationale
- Navigate slides 1-3 on PowerPoint with participant

Step 2: Instructions
- Navigate slides 4-16 on PowerPoint with participant
- After completing the PowerPoint, review the key components from PowerPoint with participant using blank template of TPRA

Step 3: Model
- Give the participant a copy of blank template of TPRA
- Say “Now that we have reviewed the components of a TPRA observation form, the next training step is to practice using it. First, take a moment to review the data collection legend on the form and complete the top portion of the form before our observation. If you have any questions, I can pull up slides from the first training to review.”
- Allow participants up to 5 minutes to complete these steps. Have PPT open to review any slides for questions in completing beginning portion of form.
- For a model session:
  - Give the participants a copy of the DI script they will be observing to become familiar with
    - Indicate that we will only be recording learn units in the actual lesson (i.e., no instructions or practice questions)
  - Have a confederate deliver the lesson while the researcher and participant(s) observe
    - Confederate script should be pre-programmed with some errors in delivery of antecedents and consequences
  - Participants and researcher should sit apart with clipboards so scoring forms are not visible to one another
- After model session:
  - Allow time for participants to complete calculations
    - Have PPT open to review any slides for questions in completing final portion of form.
Researcher should review participant TPRAs with them
Researcher should review each learn unit as follows:
  ▪ For learn unit one, I marked “___ (indicate Y/N)”
    • If student has the same, have them circle the L.U. number
    • If the student does not have it the same, discuss which part was different (see script options at bottom of instructions)
  ▪ After going through all L.U., have the participant add up all circled L.U.s
    • Researcher calculate percent correct
    • If greater than 75%, student may proceed to DI probe session
    • If not, repeat model step
  ▪ Researcher should also review calculations and provide feedback/immediate practice for errors

**Procedure: Administering and Giving Feedback on Video Observation TPRA**

Setting: Small room with table and chairs in reading center

Materials:
- Computer with access to Google drive shared folder (“Dissertation Videos”)
  - Headphones (optional) or computer speakers
- Blank TPRA observation form and pencil for participant
- Blank TPRA observation form and pencil for researcher
- 2 printed copies of the DI script for lesson in observation video
- Video observation scoring form (for research or research assistant use only)

**BST: Practice Phase**

**Video Observation Administration Protocol**

1. Select the video from Google drive folder indicated for today’s observation
   *Note: For this phase of the study, the video should be of the participant implementing a Great Leaps lesson from previous session*

2. Arrange computer on desk for optimal viewing (i.e., turn up brightness on screen, orient away from windows to avoid glare)
   a. Please ensure disruptions will not pop-up during video (i.e., email or text alerts)
   b. Make video full screen

3. Deliver pre-observation instructions:

   *Today you will be observing a pre-recorded video of yourself delivering a lesson. During the observation, please complete this TPRA observation form to the best of your ability. I cannot pause or rewind the video during the observation so take a moment to fill out the top portion of the form now. <Pause and provide any necessary details regarding lesson or student information> Any questions before we begin?*
Additional information to remind the participant of before observation:

- Error correction procedure for observed procedure (with example)
- Criterion for N/A recording on TPRA form (when antecedent provided by teacher is incorrect and student is unable to make a correct response as prescribed by the procedure)
- Statements like “mmmmm” and “okay” do not represent R+ following a correct student response and should be recorded as R- on TPRA
- Criterion for recording social praise/token (tally mark for each token delivered)
- Remind participant that they can score each Learn Unit at end of observation rather than in real time during video
- Indicate to the participant that you will be recording time for the video and giving them information for “Start” and “End” time

4. Press play on video and complete the TPRA form along with the participant while viewing the video.
   a. **RESEARCHER WILL TIME THE VIDEO FOR TPRA**
      i. You will tell the participant at the end of video what time to record for start and end time

5. Upon completion of the video observation, allow the participant time to complete the counts and calculations on TPRA (~5 minutes). Participant may use a calculator on their phone or researcher’s phone.
   Facilitator note: Do not provide any feedback or assistance during calculations other than providing access to calculator. If participant asks questions, you may direct them to embedded prompts in data sheet for calculating values.

6. After the participant indicates that they have finished filling out the Teacher Performance calculations, follow the steps detailed below to compare your TPRA form with participants
   **IMPORTANT: DO NOT ALLOW PARTICIPANT TO MAKE ANY CHANGES TO THEIR TPRA DURING THIS REVIEW.** They may mark as you go (i.e., circle correct learn units) using a different color pen.

   **BST: Practice Feedback Session after TPRA Observation**

   Purpose: This phase of training is intended to provide immediate performance feedback to the participant on their accuracy in completing the TPRA form. Do not provide any specific feedback about their performance in the video observed.

   1. Review the top portion of form with participant
      a. Praise completion and accuracy of all components
      b. If a part is omitted, state what is missing and what should have been included
2. Compare each learn unit on TPRA form with participant’s form
   a. Participant should be reviewing their own TPRA
   b. Allow student to read data for each row
      i. Example: “I recorded correct for teacher antecedent, an incorrect for student behavior, and C+ for teacher consequence. I marked it as a correct learn unit and a token was delivered for good speaker voice.”
   c. For a complete/accurate row, offer a praise statement
   d. For any error, immediately correct:
      i. Example: “The teacher antecedent was incorrect in this example. The teacher said ______ but omitted ______”
      ii. If you are unable to recall, you may return to that portion of the video to review with participant
      iii. OR if participant requests further clarification, you can review the video
   e. After reviewing all learn units in lesson, review totals at bottom of each column
      i. Provide specific feedback for errors in calculations
3. Review Start/End time recorded and calculation of converted time
4. Review Teacher Performance box; if errors made, explain to participant the proper calculation to achieve correct numbers.
   a. Note: These values may differ from yours due to data collecting by participant. Feedback should be based on the accuracy of calculations based on data on their form.
5. Deliver the post-observation instructions:

   Please summarize briefly for me some of the strengths and areas for improvement in the delivery of this lesson from your observation. You can specifically walk me through feedback you would provide using the TPRA form or simply state more broad observations.
   Facilitator note: Do not provide any verbal or written feedback except head nodding and statements of affirmation such as “I understand” or “I see”. Record notes on your TPRA form from video observation.

6. Collect the TPRA form from participant and proceed to the Procedure for DI Session.
7. After the DI session is complete, finish the Video Observation Scoring Form and place both forms, together, in the “Completed Forms” folder in back of Research Binder.

Scoring TPRA Observation Form Protocol

1. After the participant has completed the entire session (Observation and DI Lesson), please score their TPRA observation form for accuracy.
2. Label your version of the TPRA “VIDEO KEY” followed by date and participant name.
3. Compare the participants TPRA observation form to the key.
a. For a learn unit to be recorded accurately, ALL components of a row must match the key. If even one data point differs from the key, the entire learn unit is marked as incorrect.

4. Calculate Percent Accuracy and write any considerations or brief notes on participant’s summary of observation in “Notes” section on score form

5. Place the Score Form as well as the Participant’s TPRA form in the “Completed Forms” folder in back of Research binder.

Post-Video Observation Session: DI Lesson Administration Protocol

Setting: Small room with table and chairs in reading center

Materials:
- 2 copies of lesson script (one for participant and one for research assistant)
- Pencils
- White board and dry erase markers
- Video camera to record session (when two observers not present)
- Treatment fidelity form and clipboard

See notes at bottom of procedure for modifications when confederate is used instead of child for reading lesson procedure

Probe Sessions: Lesson Administration Protocol

1. Orient the participant to the workspace used for session (i.e., location of white board and markers for board work, printed script of lesson)

2. Give the participant the script for probe session lesson.

3. Ensure that all video observation materials and TPRA are out of workspace while participant prepares for the lesson.

4. Provide the participant with the following instructions:

   I will now give you a few minutes to orient yourself to the script for today’s lesson. Then I will ask you to deliver a lesson to a practice student. I cannot interject to help with lesson content or administration so if you get stuck at any point, do your best and keep going through the end of the lesson.

5. Before they begin, confirm that the video camera is on and orient appropriately to the participant’s workspace.

6. Move to an unobtrusive spot in the room and record data on treatment fidelity form.
7. After the lesson is complete, praise student for reading with us and walk them back to the library

8. End session by asking the participant for general feedback on how they felt the lesson went (make note of specific issues or concerns they express in “Notes” section of your treatment fidelity form or reverse side of paper, as needed)
   a. Note: Do not provide any feedback or answer any questions that cannot be addressed directly from the training manual materials. Do not review your TPRA form with participant.

9. Make sure that your treatment fidelity form is complete with name, observer’s name, date, time, and any necessary notes. Leave completed form in RA folder labeled “Complete Treatment Fidelity Forms”

After the session, complete calculations for TPRA Teacher Performance and file completed form in “Completed Forms” of Research Binder.
Appendix C

Data Sheets
**Teacher Performance Rate and Accuracy Scale (TPRA)**

**Date:** __________  **Observer:** ________________

**Instructor:** ________________________________

**Program:** ________________________________

**Student/Group:** ________________________________

**Start Time:** __________  **End Time:** __________

<table>
<thead>
<tr>
<th>No.</th>
<th>Teacher: Antecedent</th>
<th>Student: Behavior</th>
<th>Teacher: Consequence (R+, R-, C+, C-)</th>
<th>Correct Learn Unit? (Y or N)</th>
<th>Token + Social Praise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
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<tr>
<td>14.</td>
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<td>R+ R- C+ C-</td>
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</tr>
<tr>
<td>15.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>+ -</td>
<td>+ -</td>
<td>R+ R- C+ C-</td>
<td>Y N</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Comments/Notes:**

**Teacher Performance**

- **Total Correct Learn Units:** __________
- **Total Incorrect Learn Units:** __________
- **Instructor Correct per Minute:** ________ (# of correct learn units / converted time)
- **Instructor Incorrect per Minute:** ________ (# of incorrect learn units / converted time)
- **Token/Social Praise per Minute:** ________ (# of praise statements / converted time)

**Data Collection Definitions**

**Teacher: Antecedent**
(+): gains student attention and presents prescribed written and/or verbal instruction and response signal (i.e., snap fingers)
(-): any of the antecedent behaviors above omitted or presented incorrectly

**Student Behavior**
(+): student makes correct response
(-): student makes incorrect response

**Teacher: Consequence**
(R+): teacher delivers praise contingent on correct response
(R-): teacher does not deliver praise contingent on correct response
(C+): teacher delivers complete error correction following student incorrect response
(C-): teacher omits or delivers incorrect error correction following student incorrect response

**Correct Learn Unit?**
Y = Teacher presents Antecedent and Consequence correctly
N = Teacher omits or makes error in Antecedent or Consequence delivery

**Calculate converted time by calculating total number of seconds then dividing by 60**

**Converted Time (decimal):** __________
TPRA Scoring Form

Date: _____________ Completed by: ________________________________

Participant Name: ___________________________ Video # ________

Intervention Integrity (Circle One):

1. Did the participant complete the observation when scheduled to occur and indicate accurate date and observation information on top of TPRA? Yes No

2. Did the participant collect data for at least 5 complete learn units on the TPRA data sheet? Yes No

3. Did the participant calculate Teacher CPM and ICPM in the Teacher Performance box? Yes No

Notes:

TPRA Accuracy Scoring

*See scoring procedure in Research Binder “Written Procedures” tab*

<table>
<thead>
<tr>
<th>Accuracy of ENTIRE Learn Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
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<tr>
<td>7.</td>
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<tr>
<td>8.</td>
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<td>9.</td>
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<tr>
<td>10.</td>
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<tr>
<td>11.</td>
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<tr>
<td>12.</td>
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<tr>
<td>13.</td>
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<tr>
<td>14.</td>
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<tr>
<td>15.</td>
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<tr>
<td>16.</td>
</tr>
<tr>
<td>17.</td>
</tr>
<tr>
<td>18.</td>
</tr>
<tr>
<td>19.</td>
</tr>
<tr>
<td>20.</td>
</tr>
<tr>
<td>Total Correct</td>
</tr>
<tr>
<td>Percent Accuracy</td>
</tr>
</tbody>
</table>

Coding Reminder: For a learn unit to be recorded accurately, **ALL** components of a row must match the key. If even one data point differs from the key, the entire learn unit is marked as incorrect.

( +) Entire Learn Unit recorded accurately
( - ) Any component of Learn Unit marked incorrectly

Percent Accuracy:
Number correct / Total Learn Units x 100

Notes from participant summary of observation:
Appendix D

Treatment Fidelity Forms
### RA Treatment Fidelity Form: Lesson Probes

**Notes for Research Assistant BEFORE beginning session:**
- Ensure video camera is recording and oriented correctly
- Do not provide any prompts or interact with participants during session

<table>
<thead>
<tr>
<th>Before the Lesson</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher greets student and sits at table next to student</td>
<td>+ -</td>
</tr>
<tr>
<td>Teacher reviews complete “Rules for Reading” with student</td>
<td>+ -</td>
</tr>
<tr>
<td>Teacher places Token Board near/visible to student</td>
<td>+ -</td>
</tr>
<tr>
<td>If activity begins with Instructions, teacher presents complete script</td>
<td>+ - NA</td>
</tr>
<tr>
<td>If activity begins with Practice example, teacher presents complete script</td>
<td>+ - NA</td>
</tr>
</tbody>
</table>

**Please collect data on the researcher Lesson Script copy as follows:**
- Record data next to each Antecedent delivered by teacher
  - + for correct antecedent
  - – for incorrect antecedent
- Record Student Response on designated line
  - Checkmark for correct
  - Circle for incorrect
- Record Error Correction/Reinforcement in the far-right margin next to each student response
  - R+ for Correct Reinforcement
  - R- for Incorrect Reinforcement
  - C+ for Correct Error Correction
  - C- for Incorrect Error Correction

<table>
<thead>
<tr>
<th>After the Lesson</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher reviews Token Board with student</td>
<td>+ -</td>
</tr>
<tr>
<td>If token board is complete, Teacher directs student to select a prize</td>
<td>+ - NA</td>
</tr>
<tr>
<td>Teacher puts complete data sheet in student binder (must have name/date)</td>
<td>+ -</td>
</tr>
</tbody>
</table>

**Social Praise or Token Delivered (Tally)**

**Notes:**
RA Name: __________________ Date: ____________ Participant:__________
Student:___________

RA Treatment Fidelity Form: Dolch Sight Words

Notes for Research Assistant BEFORE beginning session:
☐ Ensure video camera is recording and oriented correctly
☐ Do not provide any prompts or interact with participants during session

Before the Lesson:

<table>
<thead>
<tr>
<th></th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher greets student and sits at table next to student</td>
<td>+ -</td>
</tr>
<tr>
<td>Teacher reviews complete “Rules for Reading” with student</td>
<td>+ -</td>
</tr>
<tr>
<td>Teacher places Token Board near/visible to student</td>
<td>+ -</td>
</tr>
</tbody>
</table>

List targets corresponding to A, B, and C
A: M: Matching trial
B: T: Tact trial
C: P: Pointing trial

<table>
<thead>
<tr>
<th></th>
<th>Teacher Antecedent</th>
<th>Student Behavior</th>
<th>Teacher Consequence</th>
<th>Social Praise/Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T: B</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>2</td>
<td>T: A</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>3</td>
<td>M: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>4</td>
<td>P: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>5</td>
<td>P: B</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>6</td>
<td>P: A</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>7</td>
<td>M: A</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>8</td>
<td>M: B</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>9</td>
<td>T: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
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<td>+ -</td>
<td>R C</td>
</tr>
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<td>R C</td>
</tr>
<tr>
<td>3</td>
<td>M: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>4</td>
<td>T: A</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>5</td>
<td>P: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>6</td>
<td>T: B</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>7</td>
<td>P: A</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>8</td>
<td>P: B</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
<tr>
<td>9</td>
<td>T: C</td>
<td>+ -</td>
<td>+ -</td>
<td>R C</td>
</tr>
</tbody>
</table>

After the Lesson:

<table>
<thead>
<tr>
<th></th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher reviews Token Board with student</td>
<td>+ -</td>
</tr>
<tr>
<td>If token board is complete, Teacher directs student to select a prize</td>
<td>+ - NA</td>
</tr>
</tbody>
</table>
Video observation intervention integrity

For every video observation, researcher or research assistant should review TPRA completed by participant for intervention integrity and accuracy of completion.

Intervention Integrity:

1. Did the participant complete the observation when scheduled to occur and indicate accurate date and observation information on top of TPRA?
2. Did the participant collect data for at least 5 complete learn units on the TPRA data sheet?
3. Did the participant calculate Teacher CPM and ICPM in the Teacher Performance box?

To determine the percentage of integrity for any given observation, divide the number of sections completed by three (i.e., by the total number of components). For example, if one component was scored as not being completed with integrity but the other two were, the percent integrity would 66.7% (2/3 = .667 * 100 = 66.7%).

Procedural Fidelity

When completing a Procedural Fidelity check, please use the forms for relevant procedures and calculate percent accuracy by dividing number of steps completing correctly by total number of steps and multiplying by 100.
Appendix E

Training Knowledge Checklist
1. Underline the entire ANTECEDENT presented by the teacher in the following example:

   Teacher says “Today we are going to learn the sound mmm” while pointing to the letter M on board. “What sound does the letter M say? Get ready.” Teacher places finger at the first dot under the letter M. Student says “mmm”.

2. Circle the STUDENT BEHAVIOR in the previous example.

3. In order to reinforce the student response, the teacher should:
   a. Repeat the “mmm” sound after the child
   b. Say “great work!” and give the child a high five
   c. Move on to the next sound in lesson

4. In the Great Leaps program, a correct student response is recorded with a _____.
   An incorrect response is recorded with a _____.

5. If the child makes an error, you should:
   a. Tell them to try again
   b. Immediately correct the error by saying the sound or word aloud correctly and represent the antecedent for student
   c. Move on without praising

6. Circle all of the following examples of errors that should be immediately corrected:
   a. Saying the word wrong
   b. Sounding out a word and taking a few seconds to get it
   c. Skipping a word
   d. Flat or expressionless reading
   e. Not responding within 5 seconds of teacher instruction

7. Give an example of REINFORCEMENT you should use in your instruction:
Appendix F

Rules for Reading Lessons
Rules for Reading Lessons

1. You should stay in your seat, listen to the teacher, and try your hardest when it is your turn to read.

2. The teacher will give you a signal when it is your turn to talk or read. (Practice)

3. Use a nice loud voice when you read

4. If you have a question during the lesson, raise your hand. Your teacher may ask you to wait until the end of lesson to talk about the question.

5. You can earn stars throughout the lesson for following the rules. If you earn enough stars to fill up your token board, you can choose a prize from the treasure chest at the end of the day!
Appendix G

Dolch Words Lesson and Data Sheet
Procedure: Dolch Sight Words

**Purpose:** To teach student to recognize and read common sight words encountered in age-appropriate texts.

**Materials:**
- Index cards with target words – 2 cards for each target word
- Data sheet and pencil

**Data Collection:** Run 2 sessions together for a total of 18 trials
- Indicate today’s date at top of session box where it says “D: ___”
- Record + for correct student responses
- Record – for incorrect student responses

**Matching Trials:** Indicated by letter M on data sheet
1. Place 3 index cards on table (Note: rearrange cards between each trial)
2. Teacher says, “Match ______” (says the word on card while presenting index card with printed word)

*Correct student response:* Student matches word within 5 seconds
*Incorrect student response:* Student does not match word correctly within 5 seconds

**Error Correction:** Point to corresponding card on table and repeat “Match _____”

**Pointing Trials:** Indicated by letter P on data sheet
1. Place 3 index cards on table (Note: rearrange cards between each trial)
2. Teacher says, “Point to ______” (says target word)

*Correct student response:* Student points to correct word within 5 seconds
*Incorrect student response:* Student does not point to correct word within 5 seconds

**Error Correction:** This is “______” (point to correct word). Represent trial immediately.

**Tact Trials:** Indicated by letter T on data sheet
1. Hold up index card with target word.
2. Teacher says, “What word?”

*Correct student response:* Student says correct word within 5 seconds
*Incorrect student response:* Student does not say correct word within 5 seconds

**Error Correction:** This is “______” (correct word). Represent trial immediately.
### Dolch Sight Words

<table>
<thead>
<tr>
<th>Child:</th>
<th>Teacher:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dolch Sight Words</strong></td>
</tr>
<tr>
<td>D:</td>
<td>D:</td>
</tr>
<tr>
<td>1 T: B</td>
<td>1 M: A</td>
</tr>
<tr>
<td>2 T: A</td>
<td>2 M: B</td>
</tr>
<tr>
<td>3 M: C</td>
<td>3 M: C</td>
</tr>
<tr>
<td>4 P: C</td>
<td>4 T: A</td>
</tr>
<tr>
<td>5 P: B</td>
<td>5 P: C</td>
</tr>
<tr>
<td>6 P: A</td>
<td>6 T: B</td>
</tr>
<tr>
<td>7 M: A</td>
<td>7 P: A</td>
</tr>
<tr>
<td>8 M: B</td>
<td>8 P: B</td>
</tr>
<tr>
<td>9 T: C</td>
<td>9 T: C</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>Total:</strong></td>
</tr>
</tbody>
</table>

**D:**  7/9  **% Total:**  100%  **Total:**  7/9  **% Total:**  100%  **Total:**  7/9  **% Total:**  100%  **Total:**  7/9  **% Total:**  100%

**A:**

**B:**

**C:**

---

+ = correct
- = incorrect
Appendix H

Social Validity Survey
Post-study Participant Feedback

* Required

Did you like watching videos of your own implementation of procedures? *

1 2 3 4 5
Not at all ○ ○ ○ ○ ○ Very much

Comments on what you liked or did not like about video self-observations:

Your answer

Do you feel like you benefit from scoring your own behavior using the TPRA form? *

1 2 3 4 5
Not at all ○ ○ ○ ○ ○ Very much

Comments of what you liked or did not like about the TPRA forms for observations:

Your answer

Do you think you would use the TPRA form in your current teaching/ training setting? *

1 ○ Yes
Comments on using TPRA in your current setting:

Your answer

Would you feel comfortable training a peer on the use of the TPRA to measure rate and accuracy? *

1 2 3 4 5

Not at all  o  o  o  o  o  Very much

Comments on your comfort level to train a peer on the TPRA:

Your answer

Any other comments from your research experience:

Your answer

SUBMIT

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Appendix I

Social Validity Data
Did you like watching videos of your own implementation of procedures?
4 responses

Do you feel like you benefit from scoring your own behavior using the TPRA form?
4 responses
Do you think you would use the TPRA form in your current teaching/training setting?
4 responses

Would you feel comfortable training a peer on the use of the TPRA to measure rate and accuracy?
4 responses
Appendix J

Pre-baseline Survey
Experience Questionnaire for Study Participants

Please complete this form regarding your previous experience or knowledge.

* Required

Name *

Your answer

Are you a certified teacher? *

- Yes
- No

If so, please briefly describe your teaching experience (how many years and what grade/age level).

Your answer
Experience Questionnaire for Study Participants

Are you currently seeking supervision to become a Board Certified Behavior Analyst? *

- Yes
- No

If so, approximately how many hours of supervision have you accrued?

- Under 150 hours
- 150-500 hours
- 500-750 hours
- Over 1000 hours

How much experience do you have in Applied Behavior Analysis (ABA)? *

- I do not have any ABA experience.
- Less than one year
- Less than two years
- More than two years
Experience Questionnaire for Study Participants

Have you ever used Direct Instruction curriculum before? *

- Yes
- No

If yes, what Direct Instruction curriculum have you used before?
Your answer

Have you used behavioral procedures to teach general education students before?
Your answer

Have you used or be given performance feedback using a treatment fidelity form? *

- Yes
- No
If so, please briefly describe the form and feedback you have been given on your delivery of instruction.

Your answer

Submit

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Appendix K

Informed Consent Document
Western Michigan University
Department of Psychology

Principal Investigator: Denise E. Ross, PhD
Student Investigator: Katherine Mahaffy
Title of Study: Establishing the Literacy Skills of Secondary Students with Reading Delays

You are invited to participate in a research project titled "Establishing the Literacy Skills of Secondary Students with Reading Delays." This consent document will explain the purpose of this research project and will go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. This project will serve as Katherine Mahaffy's dissertation for the requirements of the doctoral program in the Department of Psychology. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

What are we trying to find out in this study?
The purpose of this study is to test strategies to improve the accuracy and efficacy of reading interventions that can be used to establish the reading repertoires of secondary students with reading delays.

Who can participate in this study?
You can participate in this study if you are: a) an undergraduate or graduate student in Psychology, Education, or Communication studies at Western Michigan University OR a current preschool, elementary, or secondary teacher; and b) willing to participate in weekly training and feedback sessions on reading instruction.

Where will this study take place?
This study will take place in a quiet room at Western Michigan University or at a school site with the researcher. You and the researcher will be in the instructional room. A research assistant may also be present.

What is the time commitment for participating in this study?
You will be asked to participate in no more than 1-4 training sessions per week. Training sessions will take up to 45-minutes. Sessions will take place no more than four days per week for no longer than sixteen weeks.
What will you be asked to do if you participate in this study?
Your participation will take place in two phases. First, you will be trained to implement a reading curriculum. Second, you will be asked to observe someone else implementing the reading curriculum and measure their implementation with an observation tool. Your sessions may be video or audio recorded for the purpose of review by the researchers in scoring sessions accurately or for use in research presentations. Consenting to video or audio recording of sessions is optional and is not a requirement for participation in this study.

What information is being measured during the study?
In this study, researchers will collect data on the accuracy with which you implemented the reading curriculum and the accuracy of your use of an observation tool.

What are the risks of participating in this study and how will these risks be minimized?
The risks associated with this study are no more than you might experience during training, feedback, or instruction at your school. You might feel uncomfortable if you are bored or uneasy being observed by the reading coaches. We can always start again in another session, if you would like to do so.

What are the benefits of participating in this study?
You will be trained in and have supervised feedback implementing evidence-based reading instruction program as well as experience filling out treatment fidelity forms to assess accuracy of implementation. You may learn how to implement a reading program.

Are there any costs associated with participating in this study?
You will not have any cost for your participation.

Is there any compensation for participating in this study?
All participants will receive a $20 gift card for completing the study. Participants who leave the study before completing it will not receive a gift card.

Who will have access to the information collected during this study?
The records of this study will be kept confidential unless mandated by law. The investigator will not include the names of any students involved in the research in research reports. Study materials will be stored in a locked file cabinet or in a password protected online storage site. Your name will not be used on data collection sheets. Instead, you will be identified by a code such as P1 or P2. Only my research assistants or I will have access to these records. Some sessions may be video recorded but all records, including videos, will be destroyed after three years. We may present the information from this research project at meetings or conferences, including video-taped sessions.
**What if you want to stop participating in this study?**

You can choose to stop their participation in the study at any time for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences either academically or personally if you choose to withdraw from this study. The investigator can also decide to stop your participation in the study without your consent.

Should you have any questions prior to or during the study, you can contact the primary investigator, Denise Ross, at 269-387-4925 or denise.ross@wmich.edu. You may also contact the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>Initials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>( )</td>
<td>( )</td>
<td>__________</td>
</tr>
<tr>
<td>Data</td>
<td>( )</td>
<td>( )</td>
<td>__________</td>
</tr>
</tbody>
</table>

Please Print Your Name Here

Please Sign Your Name Here

Date