The Effects of Fluency Training on Performance, Maintenance, and Generalization of Parenting Skills

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University of South Florida
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and Generalization of Parenting Skills

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
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ABSTRACT

The effects of fluency training on performance, maintenance, and generalization of parent training skills were examined within the context of a classroom and home setting. Three foster parents attended a 24-hour Parenting Tools for Positive Behavior Change (PBC) course. Participants completed timed fluency drills using flash cards to increase learning and performance of PBC tools. A non-concurrent multiple baseline design across participants was used to assess participant performance on flash card drills and PBC tools during in-class, pre-test, and post-test role plays, and in novel situations with children in the home before, during and after the course. Results showed that fluency training had little or no effect on increasing tool performance across all testing phases for all participants, nor were there any changes in frequency and accuracy of fluency trained tools in the home to indicate maintenance and generalization of treatment effects.
Chapter One

Introduction

Behavior analysis has provided a wealth of empirically validated strategies for improving learning outcomes across a variety of populations. Many of these strategies were developed in basic research laboratories and were introduced or modified in applied settings (Binder & Watkins, 1990). Behavior analytic principles such as reinforcement schedules, behavioral shaping, stimulus fading, discrimination, and other research-based principles have been employed to address problems and challenges in education (Binder & Watkins). The implementation of these principles has led to the development of multiple research-based strategies to improve overall student performance with regard to academic and non-academic behavior, teacher instruction, and measurement systems in educational settings. Such strategies include the use of response cards (e.g., the use of a dry erase board on which students write and display answers to teacher delivered questions, see Gardner, Heward, & Grossi, 1994), programmed instruction (e.g., where students respond to carefully designed questions and are provided with immediate feedback on performance, thus shaping delivery of future material, see Vargas & Vargas, 1991), and direct instruction (which places an emphasis on faultless communication using modeling and feedback, see Kinder & Carnine, 1991). These strategies have provided educators with multiple means of producing outcomes such as increased response rates, higher grades, and greater retention. Precision teaching (Lindsley, 1990) is another strategy that provides an instructor with the added benefit of frequent measurement of student performance and improved student response rates, in addition to increases in the retention, endurance, and application of learned skills.
Developed by Ogden Lindsley in the 1960s, precision teaching (PT) is the method of measuring student performance on a frequent (e.g., daily) basis, and subsequently using the data obtained from this measurement to analyze performance and propose instructional and motivational strategies to mediate any failures to learn (West, Young, & Spooner, 1990). West et al. maintain that precision teaching is “not so much a method of instruction as it is a precise and systematic method of evaluating instructional tactics and curricula” (p. 5). Precision teaching originated in basic research laboratories and developed inductively from research in free operant conditioning (Lindsley, 1992). According to Lindsley, precision teaching involves the application of rate of response and standard cumulative recording strategies to assess learning in the classroom. This method of assessment allows instructors to base “educational decisions on changes in continuous self-monitored performance frequencies displayed on standard celeration charts” (p. 51). Lindsley suggests that cost effective and time efficient learning occurs when performance is counted and charted on a daily basis by learners. With the use of precision teaching, learning is maximized when high performance aims (i.e., pre-set fluency criterion for a skill) are established. This is incredibly important to both the instructor and leaner in that the instructor, when provided with frequent feedback, can adjust instructional methods so that the leaner is able to achieve learning objectives. This facilitates acquisition, retention and mastery of instructional material.

There are seven basic elements that make up the framework of precision teaching (West et al., 1990). The first element is “the student knows best” (West et al, 1990, p. 5). This suggests that an instructor, by analyzing the student’s behavior, can determine whether learning is occurring or whether the instruction being provided is appropriate and
effective. A second important element of precision teaching is an emphasis on direct, continuous measurement and daily monitoring and analysis of behavior. Such continuous measurement of behavior allows the instructor to make timely changes in instruction if students are failing to meet dynamic aims (i.e. projected trends) (Binder and Watkins, 1990). The third element involves measuring behavior using rate of response, defined as a “behavioral event or products per unit of time” (Lindsley, 1991, p. 254). According to Lindsley, this provides a more accurate indication of performance than the more traditional “percentage correct” measure. Rate of response data is then plotted on a standard celeration chart. Celeration charting is the fourth element of PT and facilitates easy visual analysis of data with regard to performance trends, and allows both the student and instructor to identify patterns in performance, and make necessary changes if needed.

A fifth element in the framework of PT is the use of descriptive and functional definitions to describe behavior and behavioral processes. Binder and Watkins (1990) further explain this element by stating that in precision teaching, operational or descriptive definitions of events (e.g., antecedent events and movement cycles) were distinguished from functional definitions (e.g., stimuli, consequences, or responses) of events. Thus, the authors explain, functional relations were determined between behavior and environmental variables. A stimulus was only considered a consequence when it caused a change in the rate of the behavior that preceded it. The sixth element emphasizes continued monitoring and analysis of instructional strategies, with a specific focus on the impact of those strategies on student learning. Continued monitoring facilitates immediate feedback and allows timely changes to the curriculum, thus
increasing learning. Finally, the seventh element focuses on increasing appropriate behavior instead of placing an emphasis on decreasing or eliminating inappropriate behavior (i.e., errors). According to Binder and Watkins, research has shown that encouraging rapid response rates facilitates greater learning, even when error rates remain relatively high. Although errors are usually corrected, decreasing errors is not the main focus of instruction.

One particularly attractive feature of PT is that it can be easily combined with other curricular approaches (e.g. Direct Instruction, personalized system of instruction or programmed instruction). For example, Morningside Academy offers a program that teaches basic skills (reading, writing and math) to adult learners. The program incorporates the use of PT with other instructional strategies such as direct instruction and the Tiemann-Markle instructional design (Lindsley, 1992). Performance measures indicate that students who complete this program exhibit performance levels at or above the national eight-grade literacy standard, and achieve gains that exceed government standards. These outcomes provide support for the utility of PT within an existing curricula and the efficacy of PT in assessing the appropriateness of curricula.

Unfortunately, data on maintenance or generalization of learner skills/performance were not presented. Such data would demonstrate the durability of skills and provide an indication of skill maintenance; two important components in any behavior change procedure.

Instructors that use precision teaching have not only demonstrated increased performance in learners, but have also provided a means by which curriculum choices for learners can be adopted or improved. Lindsley (1990) describes a study in which a
second grade teacher was able to implement curriculum changes to improve the performance of the children in the classroom. Children in the class wrote answers to simple addition and subtraction problems on a PT worksheet during 1-minute timings. Although the children demonstrated high rates of correct responses, their error learning was poor (i.e., errors occurred at a low rate below the record floor). However, when the curriculum was adjusted and children were required to write answers to a combination of addition, subtraction, and multiplication problems with no prior instruction, both high rates of correct and error learning were observed. The latter task was an example of a curriculum “leap up” (i.e. an advancement in curriculum to a new learning objective). Lindsley concluded that the leap up in curriculum made the mathematics problems more difficult, but facilitated increased and efficient student learning and made the learning experience for the children more enjoyable. In other words, increases in errors were desirable because they provided children with additional opportunities to respond and learn. The data obtained from this study also showed that PT can be used in the acquisition of skills (e.g., multiplication) not previously taught. Despite promising outcomes in student learning, data on student retention and generalization of skills to other problems (e.g., division problems) was not discussed.

In the same article, Lindsely (1990) discussed another classroom implementation of PT that demonstrated ways in which the most effective curriculum choices for learners could be identified. In this study, elementary school children who were one to four grade levels below their required reading levels were tutored by inner city high school students. Reading materials included multiple vocabulary lists, the local newspaper, various graded readers, and pupil written stories. Each child received tutoring from the same tutor for 45
minutes, five days a week. Over a two-week period, each child read from three different materials during three different daily one-minute timings. If the child showed the “steepest learning” (exhibited by the slope on the standard chart) with one curriculum method (e.g., newspaper) in comparison to the other two methods (e.g., the graded reader, pupil stories), the former curriculum material would be kept and compared with two other curricula for the following two week period. The two curricula that resulted in poor learning would then be discarded. Thus, instructors simultaneously explored, identified, and implemented curriculum choices that resulted in increased leaning for the children. Unfortunately, this study also failed to discuss student retention of learned material, response rates, or generalization of learned material.

Although precision teaching is largely regarded as a strategy for assessing the appropriateness of an educational program in producing satisfactory learning outcomes, strategies for teaching have evolved as a natural outgrowth of the basic assumptions of precision teaching. One such strategy is fluency training. Binder (1996) defines fluency as competent performance that is characterized by a combination of accuracy plus speed. It is “the rate of accurate performance and is typically measured as the number of correct and incorrect responses per minute” (Bucklin, Dickinson, & Brethower, 2000). According to Binder (1988), fluency is the true indicator of mastery. If an individual is fluent in a skill, they will be able to retain the learned skill, apply it to previously untrained skills or situations, and perform the skill easily in the presence of distraction. Precision teaching promotes fluency, because the PT framework facilitates the provision of multiple opportunities to respond within a specified time period (West, Young, & Spooner, 1990). There are multiple ways in which fluency may be achieved within the
PT paradigm. These methods maximize use of learning channels, which are the primary means of input and output of information. Examples of learning channels include hear/say (i.e., learners hear a question or prompt, and say the answer) and see/write (i.e., learners see the question or prompt and mark their responses) (Binder, 2001). Fluency may be built into a curriculum by infusing frequent, short (e.g., 1-minute) timed drills within instruction using varying activities that incorporate the learning channels. Some of these activities may include the use of flash cards, rapid recall exercises in which learners rapidly blurt out information recalled, practice sheets, or choral responding (i.e., groups responding to questions in unison) (Binder, 1993, 2001).

Fluency is characterized by multiple benefits that are summarized by the acronym REAPS; that is, retention, endurance, application and performance standards (Binder, 1996). Retention has occurred when the learner exhibits a high rate of accurate performance post training, after the trained skills have not been practiced over a long period of time. Maintenance has been defined as “the extent to which the learner continues to perform the target behavior after a portion or all of the intervention has been terminated.” (Cooper, Heron & Heward, 1987, p. 558). Essentially, retention and maintenance are similar concepts. Both emphasize continued performance of an acquired behavior after an intervention (in this case, fluency practice) has been removed.

Application is defined as the learner’s ability to transfer skills trained to a new and more complex task. That is, the learner is able to combine component skills and use them to perform more complex (composite) tasks that were not trained. For example, a child is fluent in solving single digit multiplication problems, and is then able to solve more complex multiplication problems using the component skills previously learned.
Baer, Wolf, and Risely (1968) define generality as a behavior change that spreads to a variety of related behavior, or appears in a variety of environments. It is important to note that this spread of behavior change may not have been directly trained or reinforced in the novel environments or with novel behaviors. Here again, the terms application and generalization are similar, and imply similar outcomes for learning.

Bucklin, Dickinson, and Brethower, (2000) conducted a study that compared rates of retention and application of learned skills in participants who had been trained to perform a task fluently, with participants who had been trained to perform a task accurately. A total of 29 students were required to learn 10 arbitrary associations between three–letter nonsense syllables and Arabic numerals, and Hebrew symbols and three-letter nonsense syllables (i.e., component skills). Participants were randomly assigned to one of two treatment groups (i.e., accuracy or fluency). All participants studied flash cards with Hebrew symbols on one side and the corresponding nonsense syllable on the other side, as well as flash cards with Arabic numerals on one side and the corresponding nonsense syllable on the other side. Participants completed the accuracy phase of the training when they could write the corresponding nonsense syllable when presented with a specific Hebrew symbol or Arabic numeral when presented with a nonsense syllable with 100% accuracy for four consecutive untimed trials. This was the only training received by the accuracy group.

After achieving accuracy, the fluency group was provided with training via the use of “See Hebrew Symbol-Write Nonsense Syllable” and “See Nonsense Syllable-Write Arabic Numeral worksheets” (Bucklin et al., 2000, p. 153). Training sessions included five one-minute timings, during which participants completed two types of work
sheets. Worksheets were randomly presented. Participants were considered fluent when they achieved 100\% accuracy for five consecutive timings; with 50 correct responses per minute on Hebrew symbol/nonsense syllable recall exercises and 100 correct responses per minute on nonsense syllable/Arabic numeral worksheets.

After meeting fluency or accuracy criteria, experimenters tested participant application of concepts by asking participants to complete a worksheet of Hebrew symbols written as arithmetic problems and asking them to write answers to the problems in Arabic numerals (i.e., composite skills), during a one-minute timing. Results from the composite test of performance indicated that the fluency group obtained a greater number of correct responses per minute when compared to the accuracy group. Tests of retention of component and composite skills conducted across 16 weeks showed that the fluency group demonstrated greater accuracy and fluency of the above-mentioned skills when compared with the accuracy group. The results of this study provided empirical evidence that fluency training resulted in better application of composite skills and increased retention of component and composite skills when compared to accuracy training alone.

The third part of REAPS is endurance. Endurance is the ability to perform a learned task over an extended time period without exhaustion, within the presence of distraction (Binder, 1996). Binder, Haughton, and Van Eyk (1990) describe endurance as being the same as attention span. According to the authors, if a learner is not fluent in a task they will be unable to sustain attention to the task for a long period of time, will emit increased error rates, and decreased learning rates.

Binder et al. (1990) examined the effects of fluency on endurance in a study with 75 students who ranged in grade levels from kindergarten to eighth grade. Students were
required to practice writing the digits 0 through 9 as fast as they could for various timings (i.e., 15 seconds, 30 seconds, 1 minute, 2 minutes, 4 minutes, 8 minutes or 16 minutes) on different days. Results indicated that students who could write digits at a rate of 70 per minute sustained performance levels during the 16-minute timing. However, students who performed below this rate were unable to sustain performance levels during the 16-minute timing. The results of this study showed that task fluency must be attained if endurance is to be attained. However, the authors did not discuss retention or application of digit writing. This is especially important in younger children with whom the use of such skills is integral to the development of math ability.

The fourth component of REAPS is performance standards, which refers to the rate and accuracy of performance or aims that must be attained for fluency training to be beneficial. Ivarie (1986) investigated the effects of varying proficiency rates on retention of writing behavior. The participants in this study were 120 fourth grade students whom had taken the math computation section of the Iowa Test of Basic Skills. Students were then grouped according to their achievement levels on the test. There were three groups: students who exhibited average performance, students who exhibited above average performance, and students who exhibited below average performance. Students in all groups were required to learn and recall relationships between Arabic and Roman numerals and subsequently were exposed to one of two treatment conditions with specified performance aims. One treatment condition required that the students acquire and maintain a proficiency rate of 70 responses per minute with 7 or less errors across three consecutive 1-minute timings. The second treatment condition required that students acquire and maintain a proficiency rate of 35 responses per minute with four or
less errors for three consecutive 1-minute timings. Students practiced and were tested on recall and writing of material until they reached the aims specified for their treatment group. After the aim was met, students were provided with an alternative activity so that they did not exceed proficiency rates. Students who did not reach the proficiency rates continued to engage in alternating practice and testing sessions.

Results of the study showed that subjects performing at the higher proficiency rate (70 responses per minute) demonstrated superior recall performance over a 90-day period in comparison to students who performed at the lower proficiency rate (35 responses per minute). The author concluded that even students at the average and below average achievement levels were able to develop high proficiency rates that would facilitate retention. Ivarie (1986) also stated that there was an interaction effect between treatment and achievement levels, meaning that the higher proficiency rate could be attributed to the performance of the average and below average groups. Therefore, she concluded that students are who were classified as average and below-average achievement may need to perform a skill at a high proficiency rate to facilitate retention of the skill. The author also noted that as testing continued across the nine-month period, there was some increase in retention for both groups, with the lower proficiency group showing better retention than the high proficiency group. Ivarie (1986) stated that a possible explanation for this change may be attributed to the practice effects of repeated testing, or a proficiency rate of 35 responses per minute may be easier to maintain. This study did not examine application or endurance of skills learned.

Research on the efficacy of fluency training has been conducted primarily with children or other students in academic settings (Ivarie, 1986; Lindsley, 1990, 1992;
Spangler & Hawkins, 1975), with a few exceptions (e.g., Binder 1989, 1996, 2001). Although these studies have demonstrated the efficacy of fluency training within a PT paradigm at improving performance, facilitating frequent measurement and feedback on student performance, and achieving REAPS, there is a relative paucity of stringent empirical investigations (Binder, 1996), especially with regard to expanding fluency training and precision teaching strategies to a variety of populations and settings. One area in which these strategies might prove particularly useful is parent training, where retention of skills and application to real-world situations are critical measures of success.

Parent training curricula employ multiple instructional strategies delivered within classroom settings such as lecture, discussion, or reading instructional materials to provide caregivers with behavior management skills (Huang, Chao, Tu & Yang, 2003; Smith & Barrett, 2002; Venning, Blampied, & France, 2003). It is imperative that skills learned within such training programs maintain and generalize to facilitate durable behavior change. However, much of the parent training literature does not investigate the extent to which parent training delivered within the classroom facilitates maintenance and/or generalization of skills (Muir & Milan, 1982; Kuhn, Lerman & Vorndran, 2003; Smith & Barrett, 2002; Venning et al., 2003). Considering the benefits of fluency training in facilitating maintenance and generalization of learned skills taught in classroom settings, including such an instructional strategy in classroom-based parent training curricula seems an appropriate and potentially beneficial course of action.

One subset of caregivers with whom fluency training might be particularly beneficial is foster parents. Foster parents are charged with the task of caring for and managing the behavior of dependent children who are placed in their care. These children
may exhibit a myriad of behavior problems that are the result of varying contingencies within their environment. In these settings, achieving REAPS with regard to parenting skills appears to be crucial. Foster parents must use effective parenting skills proficiently in the presence of distraction, and be able to retain and generalize skills learned to evoke durable behavior change in children.

Considering the benefits of fluency training, it would be prudent to implement such an instructional method within the context of a foster parent training program to facilitate the acquisition of high performance standards, maintenance of performance (i.e., retention) and generalization (i.e., application) of skills from the classroom to the home. This is important not only for the clinical value in providing effective behavioral interventions for children and their caregivers, but also for the potential to make a significant empirical contribution to the science. Therefore, the current study proposes to investigate the effect of fluency training on foster caregiver performance of specific parenting tool skills in a classroom setting and the maintenance and generalization of those skills to novel settings with children in the home.
Chapter Two

Method

Participants and Setting

Participants were three caregivers, Esther, Danna and Kenneth, who enrolled in the Parenting Tools for Positive Behavior Change (PBC) course sponsored by the Behavior Analysis Services Program (BASP). All participants were licensed foster parents and had a minimum of one child (foster or biological) residing in their home for the duration of the study. Esther was a 55-year-old female who had been a licensed foster parent for approximately ten years. At the time of this study, Esther had one foster child in her home. Danna was a 42-year-old female, and Kenneth was a 39-year-old male. Danna and Kenneth were married and had two biological children and one foster child residing in their home for the duration of the study. Danna and Kenneth had both been foster parents for 6 months prior to participation in the study. Esther participated in Class I while Danna and Kenneth participated in Class II. Esther and Danna completed all pre-test, classroom, post-test role-plays and a minimum of four in-home observations. However, Kenneth completed only pre-test and classroom testing and continued in-home observations one week after class completion.

The PBC course was taught by the principal investigator of this study. The principal investigator was a board certified associate behavior analyst who had been teaching the PBC course for 4 years. The course instructor was competency trained in the parenting tools (i.e., he/she had independently demonstrated all nine tools with 100% accuracy twice). The course provided caregivers with instruction on nine task-analyzed tools based on principles of applied behavior analysis. These tools provided caregivers
with specific strategies for managing challenging behavior. The course was taught in a classroom setting for the duration of four weeks. Two sessions were held weekly. The duration of each session was 3 hours. Data were collected both in the classroom and in the homes of the participants.

**Institutional Review**

A copy of all experimental procedures was submitted to the University of South Florida, the University of Florida and the Department of Health’s Institutional Review Board for review and approval before the start of the study. Participants reviewed and signed informed consent forms prior to the start of the study.

**Dependent Variables and Measurement**

The primary dependent variable (DV) was the accuracy with which participants performed specific parenting tools taught during the course. Data on the following PBC tools were collected: Stay close, Give positive consequences; Ignore junk behavior; Stop-redirect-give positive consequences; Pivot; Set expectations; Use a contract; Time out; and Analyze behavior using ABCs. Each DV was defined using the description included in the parenting course materials. DVs were task analyzed and converted to checklists so that both frequency and accuracy scores could be calculated (see below).

First, data were collected in the classroom during pre-test and posttest role-play situations, which were conducted during session one and session eight of the course, respectively. Data also were collected on the performance of tools during classroom role-plays during sessions two through seven. During the Stay close, Ignore junk behavior, Stop-redirect-give positive consequences, and Set expectations situations (Appendix A), a primary trainer assumed the role of a child while a secondary trainer presented the
caregiver with varying situations, and collected data on caregiver performance on each tool. During the Give positive consequences, Pivot, and Time out role-plays, the secondary trainer presenting the situation assumed the role of a second child and the caregiver was again asked to respond to each situation. Caregivers were not told which tool should be performed for each role-play.

For testing on the contract tool, caregivers read a passage and composed written responses to questions related to formulating a contract. To measure the ABC tool, caregivers observed and recorded interactions between two behavior analysts performing a role-play. Caregiver responses were then scored using the ABC task analysis. As part of the required course procedures, participants also completed a written pre-test and post-test as prescribed by the PBC curriculum either before or after completing the role-play pretest or post-test. No feedback was provided on caregiver performance on the written tests or pre and posttest role-plays.

Data also were collected in the home during naturally occurring situations. Before the start of the course, class participants were contacted via telephone to schedule a home visit as is typically done with caregivers receiving services from the BASP program. A home visit was conducted before data collection to identify potential study participants, and allow participants to review and sign informed consent forms. An interaction evaluation questionnaire (see Appendix B) was administered to determine times of day or types of interactions that evoke numerous responses from the child that may necessitate the use of PBC tools. A minimum of three home visits were conducted on various days during the time periods identified in the questionnaire. Home visits were 1-2 hours long. Home observations were conducted in 15-minute intervals, with a two-
minute break between each interval. These observations provided baseline data on tool performance. Home observations occurred on a weekly basis during the course of the PBC class. After class completion, weekly home visits were conducted during time periods identified during pre-class visits for a minimum of four weeks.

Data for both role-plays and home observations were recorded on task-analyzed tool checklists (see Appendix C), which allowed for discerning both frequency and accuracy of tool use. Performance was reported as percentage accuracy and was calculated by dividing the total number of steps performed accurately by the total number of steps in each tool and multiplying that number by 100. If during a role-play or in-vivo situation, a caregiver did not have an opportunity to perform all tool steps, accuracy was calculated by dividing the number of steps performed correctly by the number of steps the caregiver had an opportunity to perform. That quotient was then multiplied by 100. The frequency of use of each tool per session was summed.

Participant performance on fluency drills was also measured. Approximately four fluency drills were conducted during each class session. Minimum time intervals between each drill were 15 minutes. Participants recorded the number of correct, incorrect and skipped/passed responses on a data sheet (see Appendix D). Experimenters converted participant scores to rate of response, which were plotted on an equal interval graph. Rate of correct responses per minute were calculated by dividing the number of responses by 60. Rate of errors (i.e., incorrect or passed items) also was calculated with the same formula used to calculate rate of correct responses.
Observer Training

Prior to the start of the study, data collectors were trained to collect data on tool performance by observing various videotaped role-play situations exhibiting both correct and incorrect examples of tool use. Data collectors were behavior analysts and behavior assistants who were trainers for the Parenting Tools for Positive Behavior Change course. Role-play situations were scored simultaneously but independently by data collectors during the training sessions. At the end of each vignette, scorers compared their data with that of the researcher, who discussed scored sheets and provided feedback. Training continued until data collectors obtained 90% interobserver agreement (IOA) scores with the researcher across two consecutive practice observations. Approximately three training sessions were required for observers to meet criterion.

Training for fluency drill scoring was conducted during training sessions for tool scoring and during initial fluency drills during the PBC course. Data collectors were verbally instructed on how to record data collected during fluency drills. Data collectors and the researcher recorded data on Esther’s fluency drill performance on the Stay Close tool for four consecutive trails. Both the researcher and data collector were considered trained after having obtained 100% IOA scores on all four consecutive trails.

Interobserver Agreement

Table 1 displays IOA scores recorded during the study. Classroom role-plays for pre-tests and post-tests were videotaped and interobserver agreement was calculated for 100% of observations. Approximately 45% of home visits were also scored by a second independent observer. Interobserver agreement scores were calculated by dividing the
number of agreements on each step of a task analysis by the sum of agreements and
disagreements, and multiplying that number by 100.

Overall IOA obtained for accuracy data collected during pre-test, posttest and
classroom role-plays ranged from 76% - 95% with a mean of 85%. Interobserver
agreement scores for frequency of tool use ranged from 94% - 96% with a mean of 95%.
Range of accuracy for tool use in the home was 74% - 84% with a mean of 81%.

Interobserver agreement scores for fluency drills were also collected. An observer
alternated between participants during each fluency drill and simultaneously but
independently recorded responses (correct, incorrect and passed) during each task.
Approximately 63% of all data recorded during fluency drills were scored for IOA.
Agreement scores were calculated for the number of correct, incorrect and passed flash
cards by calculating the sum of each type of response recorded by the participant and
IOA data collector. For each response type, the smaller sum was divided by the larger
sum, and that quotient was multiplied by 100. Range of IOA scores for fluency drills
were 98% - 99%. Mean observer agreement scores for fluency drills for all three
participants was 99%.

Table 1

<table>
<thead>
<tr>
<th>Observations</th>
<th>Interobserver Agreement Scores</th>
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<tbody>
<tr>
<td>Percent Accuracy (Pre-test, Posttest, Class)</td>
<td>85%</td>
</tr>
<tr>
<td>Frequency of tool use (Home)</td>
<td>95%</td>
</tr>
<tr>
<td>Accuracy of tool use (Home)</td>
<td>81%</td>
</tr>
<tr>
<td>Fluency Drill</td>
<td>99%</td>
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Procedure

Class sessions were comprised of a mixture of lecture, classroom discussion, fluency drills, and various role-play situations outlined in the PBC training curriculum (a copy of the curriculum can be provided upon request). To control for practice effects, role-play situations presented in class did not include those used in the pre-test and post-test. However, feedback on role-play performance during class was provided by the trainer. To increase consistency of instruction during each session, the primary trainer proceeded with course content and activities as outlined in the PBC trainer’s script.

Baseline. During baseline, class content was delivered via instructions from the PBC trainer’s manual.

Fluency training. During fluency training, participants were asked to engage in fluency drills comprised of see/say learning channels presented via flashcards (see Appendix E). The content of the flash cards included the following: task analyzed steps of target tools, child behavior or situations in multiple settings that required use of specified tools, identification and practice in stating core concepts presented in the curriculum (e.g., classifying behavior as consequential or inconsequential, identifying open-ended questions and empathy statements). Participants worked in pairs to complete the drills. Before the start of each timed drill, participants were allotted two minutes to study their flash cards. The trainer signaled the beginning and end of timed practice and data collection using a script (Appendix F). Thus, participants had clear prompts that signaled a change in activity. Once participants were cued by the trainer to start the drill, one member of the pair held a flashcard with the question facing his/her partner and the answer facing him/her. The second participant answered each question, and the first
participant stacked the flashcards into three separate piles: correct, incorrect, and passed (i.e., answers not attempted). The first participant recorded the number of correct, incorrect, and passed flash cards on the data sheet. Participants then reversed roles and completed the exercise again. After all participants completed the drill, participants were allotted two minutes to review the cards that they got correct, incorrect or passed.

Performance aims for all fluency drills were established by calculating the range of performance (rate of response) on drills of three competency trained behavior analysts who taught the PBC course. Each behavior analyst was required to have taught a minimum of three PBC courses. Trainers were asked to complete two types of timed fluency drills (practice and experimental). Fluency drills were conducted in the manner outlined in experimental procedures for participants. The practice drill was conducted once to familiarize trainers with procedures. The experimental drills were conducted twice. The mean range of performance exhibited by each trainer during the experimental drills was recorded. Performance aims for participant fluency drills were set at the following median response rates exhibited by the trainers: Stay Close, 0.48; Give positive consequences, 0.46; Ignore junk, 0.48; Pivot, 0.55; Stop-redirect-give positive consequences, 0.5; Set expectations, 0.54; Contract, 0.5; Time out, 0.49; ABC, 0.52 correct responses per minute.

To ensure compliance to fluency drill procedures, participants were introduced to the fluency drill and methods of data collection during the first session of the course. Timed one-minute practice drills were conducted to familiarize participants with the process of collecting required materials for drills, conducting drills, collecting and recording data. The content on the practice drills presented a procedure for a simple,
arbitrary task (i.e., making a peanut butter and jelly sandwich) using the same script used during experimental sessions. The trainer explained and then modeled (a minimum of two times) a practice fluency drill, and the data recording process. Flash cards were presented in a specified order. A transparency of the correct responses and a data sheet were posted. Each caregiver classified cards as correct, incorrect or passed, and recorded data obtained simultaneously with the trainers during the second modeled drill. After modeling, participants performed the practice drills in pairs for a minimum of 10 minutes. Performance aims for training drills were set at the minimum response rates exhibited by trainers (0.33 responses per minute). Caregivers recorded the number of correct, incorrect and passed flash cards on the data sheet provided. Practice continued for approximately 15 minutes and ended when participants recorded scores with 90% accuracy.

To maintain participants’ motivation to improve their performance across fluency drills, any participant who improved his or her score by five correct responses over the previous score placed his/her name in a class drawing. At the end of session eight, the drawing was held and the winning participant was given a gift.

Experimental Design

A non-concurrent multiple baseline across participants graph was used to display caregiver performance on fluency drills and frequency and accuracy of tool performance. Fluency trained tools were counterbalanced between Class I and Class II to identify whether any changes in performance of varying fluency trained tools were the result of fluency training only and not instruction. Esther completed fluency drills on the Give positive consequences, Stay close, Set expectations, Pivot and Use ABC tools. Danna and
Kenneth completed fluency drills on the Ignore junk, Stop-redirect-give positive consequences, Time out and Contract tool.

Esther completed four weeks of one PBC course (Class I) while Danna and Kenneth completed a second four-week course (Class II) four weeks after the first class started.

Social Validity

At the completion of the classroom training, participants were administered a questionnaire with Likert type scaling to indicate their satisfaction with training methods used, the utility and their level of enjoyment or dissatisfaction with fluency drills, whether training methods used were durable, and the extent to which methods facilitated tool application within the home (see Appendix G). The questionnaire was again administered at the completion of the four-week in-home follow up. Information obtained was used to formulate conclusions about caregiver opinion on the utility and efficacy of the training methods used.
Chapter Three

Results

Figure 1 displays participants’ performance on fluency drills. The first panel shows Esther’s rate of correct and incorrect responses on fluency drills. As previously indicated, performance aims for rate of correct responses for fluency trained tools in Class I are: Stay close, 0.48; Give positive consequences, 0.46; Pivot, 0.55; Set Expectations, 0.54 and Analyze behavior using ABCs, 0.52. Esther exhibits both low rates of correct (mean, 0.106; range 0.07-0.16) and incorrect responses (mean, 0.01; range 0.0-0.03) on all fluency-trained tools. Rate of correct responses for the Stay Close tool ranges from 0.05 to 0.1 responses per minute with a mean performance rate of 0.08. Esther’s mean rate of correct performance on the Give positive consequences tool is 0.11 (range 0.06-0.16), mean performance on the Pivot tool is 0.16 (range 0.1-0.2), mean performance for the Set Expectations tool is 0.09 (range 0.08-0.11) and mean performance for the ABC tool is 0.07 (range 0.05-0.1).

The second and third panel showed Danna and Kenneth’s performance on fluency-trained tools. Performance aims for rate of correct responses for fluency trained tools in Class II were: Ignore Junk, 0.48; Stop-redirect-give positive consequences, 0.5; Time out 0.49; Contract, 0.5. Danna exhibited rates of correct responses (mean, 0.37; range 0.32-0.47) just below aims with low rates of incorrect responses (mean, 0.02; range 0-0.04). Danna’s mean rate of correct responses on fluency trained tools was: Ignore Junk (mean, 0.34; range 0.18-0.43), Stop, redirect give positive consequences (mean, 0.32; range 0.18-0.38), Time Out (mean, 0.34; range 0.21-0.48) and Contract (mean, 0.47; range 0.35-0.53).
Figure 1. Mean rate of correct and incorrect responses per minute for fluency trained tools.
Kenneth’s performance is displayed on the third panel in Figure 1. Kenneth also exhibited high rates of correct responses (mean, 0.4; range 0.34-0.5) just below aims, and met the fluency aim for the contract tool (0.5). His mean rate of correct responses on fluency-trained tools was: Ignore junk (mean, 0.34; range 0.21-0.45), Stop-redirect-give positive consequences (mean, 0.35; range 0.2-0.45). Kenneth met performance aims for the Time out tool (mean 0.42; range 0.28-0.6) and Contract (mean, 0.5; range 0.45-0.53) tool. His mean rate of response for incorrect tools was near zero for the Ignore junk (mean, 0.004; range 0-0.01), Stop-redirect-give positive consequences tool (mean, 0.004; range 0-0.01) and the Time out tools (mean, 0.004; range 0.0.01), and zero for the contract tool.

Figure 2 displays participants’ accuracy of performance on pre-test, classroom and post-test role-plays. The top panel displays Esther’s performance. Esther was enrolled in Class one, thus she was fluency trained in the Stay close, Give positive consequences, Pivot, Set expectations and Assess behavior using ABC tools. There was an increase in tool accuracy from pre-test to classroom role-plays for both fluency trained and non-fluency trained tools. Post- test scores for the Stay close and ABC tools exceeded classroom role-play scores at 78% and 100% respectively. Post-test scores for the Pivot and Set expectations tools returned to baseline scores of 0% and 42% respectively. Accuracy scores for the Give Positive Consequences tool in both classroom and post-test role-plays remained stable at 89%.

Non-fluency trained tools during Class I (Esther’s class) included the following: Ignore junk, Time out, Contract, and Stop-redirect-give positive consequences. There was a decrease in accuracy from classroom role-plays to post-test role-plays on the Ignore
Figure 2. Pre-test, classroom and post test performance on fluency and non fluency trained tools.
junk (83% to 50%) and Stop-redirect-give positive consequences tools (78% to 11%). Percent accuracy on the Contract tool remained stable at 71% across classroom and post-test role-plays, while performance on the Time Out tool increased from 38% to 50% from classroom to post-test. Despite much variability in the data across all tools, mean posttest performance on fluency trained tools (62%) was greater than mean posttest performance on non-fluency trained tools (46%). These results indicate that fluency training may have been effective in producing better learning.

The second panel in Figure 2 displays Danna’s performance on pre-test, classroom and post-test role-plays. Dana was enrolled in Class II and therefore received fluency training in the Ignore junk, Time out, Contract, and Stop-redirect-give positive consequences tools. A good deal of variability also was observed across both fluency trained and non-fluency trained tools, but in general, accuracy on all tools increased from pre-test to classroom role-play. However, in this case, fluency training did not seem to be effective in producing better learning. Performance on both the Stop-redirect-give positive consequences and Time out tools increased from pre-test to post-test with scores of 89% and 67% respectively. Accuracy scores on the Ignore junk tool across classroom and post test remained stable at 100%, while scores on the Contract tool decreased from 86% to 57% from classroom to post-test role-plays.

Tools that were not fluency trained in Class II included Stay close, Give positive consequences, Pivot, Set expectations and Assess behavior using ABCs. Performance on the Give positive consequences and Pivot tools remained stable across classroom and post-test role-plays at scores of 89% and 100% respectively. Performance on the Stay close tool returned to baseline levels of 70% at posttest. However, performance on the
ABC tool increased across the phases of testing from 83% during class to 100% during posttest. Posttest performance on the Set expectations tool decreased below baseline (pre-test) levels to 42%.

The third panel in Figure 2 shows the accuracy percentages for the second participant in Class II, Kenneth. Kenneth completed the pre-test and classroom role-plays, but did not complete post-test role-plays. There were considerable increases in performance across both fluency trained and non-fluency trained tools from pretest to classroom role-plays, except for the ABC tool. Kenneth received classroom scores of 100%, 67%, 100%, and 78% for the Ignore junk, Time out, Contract, and Stop-redirect-give positive consequences tools respectively. Pre-test scores for these tools were 0%, 6%, 0% and 22%. Kenneth scored 100% accuracy in class for non-fluency trained tools such as Stay Close, Give Positive Consequences and Pivot. His classroom score for the Set Expectations and ABC tool was 77% and 0% respectively.

Table 2 shows participants’ mean performance on pre-test, classroom and posttests for fluency trained and non-fluency trained tools. Mean posttest performance on fluency-trained tools for Esther and Danna was 62% and 78% respectively. Mean post-test performance on non-fluency trained tools for Esther and Danna was 46%, 80% respectively. Kenneth attained mean classroom performance scores of 86% and 75% on fluency and non fluency trained tools respectively.

Figure 3 displayed the participants’ frequency of tool use in the home. Fluency trained tools are represented by closed data points; while non-fluency trained tools are represented by open data points, x’s and plus signs. The top panel shows Esther’s data. Esther used the Stay close tool most consistently across phases. However, there was a
Table 2

Mean Percent Accuracy of Performance on Fluency Trained (FT) and Non Fluency (Non FT) Trained Tools During Classroom Instruction

<table>
<thead>
<tr>
<th>Test</th>
<th>Participant</th>
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<tbody>
<tr>
<td></td>
<td>Esther</td>
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<tr>
<td></td>
<td>FT</td>
</tr>
<tr>
<td>Pre-Test</td>
<td>22</td>
</tr>
<tr>
<td>Classroom</td>
<td>58</td>
</tr>
<tr>
<td>Posttest</td>
<td>62</td>
</tr>
</tbody>
</table>

downward trend across phases in the frequency of tool use, especially between class-time (mean, 5.75; range 5 to 8) and post-class observations (mean, 3.57; range 1 to 6). All other tools were used infrequently (Stop-redirect-give positive consequences, Give positive consequences and Ignore junk) or not at all (Pivot, Set expectations, ABC, Contract and Time out).

The second panel in Figure 3 showed Kenneth’s frequency of tool performance. Kenneth completed baseline, classroom and only one week of post class home visits. Kenneth also used the Stay close tool most consistently, but a downward trend in tool use appeared across phases (baseline mean, 13.25; range 7 - 19; class mean, 8.25; range 6 to 10). All other tools were used infrequently (Give positive consequences) or not at all (Ignore junk, Pivot, Stop-redirect-give positive consequences, Set expectations, Contract, Time out and ABCs).
The third panel in Figure 3 shows Danna’s frequency of tool performance in the home. Danna used the Stay close and Give positive consequences tools most frequently in her home. There was variability in the frequency of demonstration of the Stay close tool during baseline (mean, 10.33; range 5 to 25). Data for this tool were more stable during class time (mean, 6.75; range 3 to 9) and post-class observations (mean, 5; range 3 to 7). There was a slight upward trend in the frequency of demonstration of the Give Positive Consequences tool across baseline (mean, 1; range 1-2) and classroom (mean, 2.25; range 1 to 3) phases. Similar to other participants, Danna did not use a wide range of tools in the home. The Pivot and Set expectations tools were only demonstrated during baseline but were not demonstrated in other phases.

Figure 4 shows accuracy of tool use in the home. Accuracy scores were calculated by dividing the sum of all accurate tool steps performed for a specific tool by the total number of steps attempted, and multiplying the quotient by 100. The top panel displays Esther’s performance. Accuracy for the Stay close tool during baseline began relatively high (58%), but subsequent observations revealed decreases in accuracy during baseline (mean, 23.7%; range 13%-58%). Accuracy during class-time (mean, 44%; range 39%-53%) and post class (mean, 44%; range 36%-56%) was relatively stable. All other tools were used infrequently (Stop-redirect-give positive consequences (37% and 60%), Give positive consequences (11%) and Ignore junk (67%) or not at all (Pivot, Set expectations, ABC, Contract and Time out).

The second panel in Figure 4 shows Kenneth’s accuracy of performance on the Stay close and Give positive consequences tools. Data for Stay close remained relatively stable across the baseline (mean, 59.7%; range 57%-63%) and classroom (mean, 60.2%,
Figure 3. Frequency of in home tool performance. Filled data points represent fluency trained tools, open data points, x and + represent non fluency trained tools.
range 46% - 67%) phases. Scores for Give positive consequences decreased from 88% accuracy during baseline to 78% during class. Other tools such as Ignore junk, Pivot, Stop-redirect-give positive consequences, Set expectations, Contract, Time out and ABCs were not demonstrated during in home observations.

The third panel in Figure 4 shows Dana’s accuracy of performance on tools used in the home. There was a relatively stable baseline demonstrated for the Stay Close tool (mean, 56%; range 51% - 62%). Data were somewhat more variable during class (mean, 61.75%; range 43%-74%) and after class (mean, 63.7%; range 52%-92%), but overall accuracy remained relatively unchanged across phases. There was a slight downward trend in the accuracy of the Give positive consequences tool during baseline (mean, 71.75%; range 67%-78%). Accuracy increased slightly during class (mean, 82.25%; range 74%-89%) and remained within baseline range in the post class observation (77%).

Less frequently used tools such as the Pivot and Set Expectations tools occurred during the baseline phase at 50% and 25 % accuracy respectively or not at all (Stop-redirect-give positive consequences, Ignore junk, Contract, Time out, Assess behavior using ABCs).

Only Esther and Danna completed social validity questionnaires after completing their post-tests. Esther and Danna stated that flash card drills helped them to remember the concepts taught in class, were enjoyable, facilitated stimulus discrimination for tool use in the home and helped them perform better on posttest role-plays. Both Esther and Danna strongly agreed that fluency drills helped them in using tools correctly with the children in their home.

At the end of in-home visits, Esther and Danna were asked to complete the social validity questionnaire given after posttest completion once more. Esther strongly agreed
Figure 4. Accuracy of in home tool performance. Filled data points represent fluency trained tools, open data points, x and + represent non fluency trained tools.
but Danna strongly disagreed that fluency training was helpful in retention of concepts learned in class. Esther agreed but Danna strongly disagreed that fluency drills helped her perform better on posttests and were beneficial to learning. Both Esther and Danna stated that they did not enjoy using the flash cards; the drills did not help them to know when to use a specific tool in their home, or know how to use tools correctly with children in their homes.
Chapter Four

Discussion

This study investigated the effects of fluency training during classroom instruction on tool performance (learning) during class, and in the home during instruction and after class completion. Study results indicated that fluency training was not effective in increasing classroom performance of tools during posttests. Only two participants performed well on fluency drills, however these participants did not demonstrate increased performance on fluency trained tools at posttest. Fluency training was also ineffective in increasing accuracy and frequency of fluency trained tools in the home.

One goal of the study was to increase the fluency of participant responses on see-say fluency drills. However, caregiver performance on fluency drills was mixed. Both Kenneth and Danna achieved high response rates that closely approximated or met performance aims. Esther achieved low rates of correct and incorrect responses at levels considerably below performance aims. It is interesting to note that although Kenneth and Danna performed well on fluency drills, corresponding differentiation between fluency trained and non-fluency trained tool use across DVs was not observed. It is difficult to determine conclusively whether see/say fluency drills are the most appropriate instructional technology to use in increasing performance, because performance results for Danna and Kenneth are mixed. Quite possibly, drills that incorporate the use of the see/do learning channels could be more effective. During class, participants would observe a role-play situation, or read a role-play situation and perform the tool that was most appropriate in that situation. See/do drills may have provided the opportunity for
multiple tool practice opportunities, thus increasing performance. See/do drills may have also resulted in generalization of parenting skills as caregivers would have had opportunities to practice situations that may occur within the home.

All participants demonstrated an increase in performance from pre-test to classroom role-plays, indicating that the PBC curriculum was effective in facilitating learning. Both Esther and Danna’s percent accuracy on tools were higher for non-fluency trained tools than for fluency-trained tools. The opposite effect was observed in data obtained from Kenneth (i.e., classroom performance on fluency-trained tools was higher than classroom performance on non-fluency trained tools). Such mixed results indicate that fluency training had little or no effect on increasing classroom performance on fluency trained tools. It is possible that other variables could have accounted for differences in role play accuracy, including practice effects, unequal opportunities for demonstration and practice of tools, and varying curriculum activities that may have reviewed specific tool concepts or steps multiple times during classroom instruction.

With regard to posttest role play scores, Esther demonstrated no consistent improvements. However, Esther’s mean post-test performance on fluency-trained tools was higher than that of non-fluency trained tools. The opposite effect occurred with Danna’s classroom performance. Danna’s mean posttest performance on non-fluency trained tools was higher than her performance on fluency trained tools. This outcome may be attributed to tool complexity. It is possible that the Stay close, Give positive consequences, Pivot, Set expectations and ABC tools steps were less complex than the other PBC tools. Therefore, both participants demonstrated increased accuracy on these tools despite fluency training.
Another factor associated with tool complexity is the number of steps contained in each tool. The tool sets for Esther and Danna (fluency trained and non-fluency trained respectively) that were demonstrated with the most increases in accuracy of performance had 9 or less steps, with the exception of the Set expectations tool which had 14 steps. Both Esther and Dana showed decreased performance from class to posttest for this tool. The same pattern was demonstrated in Kenneth’s data; specifically, classroom performance was greatest on tools with the least steps. The exception to this is the ABC tool, on which Kenneth scored a 0% across all assessments.

A third reason that there was no replication of increased performance on fluency-trained tools across participants may relate to frequency of drills. Fluency drills on specific tools were conducted approximately four times only during the session in which the tool was taught. Therefore, there were no additional opportunities for fluency drills on a specific tool once the session was completed. Additional drills during sessions where a non-fluency trained tool was being taught may have resulted in increased rates of responses for fluency drills, and increased performance on role-plays in class and tool performance in the home.

With regard to tool use in the home, frequency of the Stay close tool occurred at higher rates than all other tools during initial observation sessions, but exhibited a downward trend across phases. This initial increase may have been the result of reactivity caused by the introduction of novel stimuli (observers) in the home environment. However, as reactivity decreased, so did frequency of performance of the Stay close tool. At this point, caregivers may have been able to discriminate more appropriate times for tool use or the performance levels now accurately reflected frequency of tool use in the
home. Since frequency of Stay close decreased across sessions, it might be concluded that fluency training had no effect in increasing frequency of performance of this tool. One might also conclude that there was no opportunity for a treatment effect for the Stay close tool because Esther was the only participant fluency trained in this tool, and her rates of response for tool drills were low.

The other tool used by all participants in the home was Give positive consequences, although frequency and accuracy varied greatly among caregivers. Esther demonstrated use of this tool only twice during baseline, Danna exhibited use of this tool across all phases with increased trend in frequency and Kenneth demonstrated use of the tool during baseline and class with decreased frequency. This may indicate that there was some generalization and maintenance of the Give positive consequences tool in Danna’s home despite fluency training. However, decreased use of this tool demonstrated by Kenneth and Esther indicates that there was no generalization and maintenance of this tool in the homes of these participants. Again, one could conclude that there was no opportunity for a treatment effect since Esther was the only participant fluency trained in the Give Positive Consequences tool, but Esther exhibited poor rates of responses on drills.

With the exception of Stay close and Give positive consequences, tools were rarely observed in the home. It is also a possibility that the Stay close and Give positive consequences tools were predominantly performed in all homes because these tools were already in each participants repertoire, there were multiple opportunities for use of these tools even at baseline, or caregivers were able to recognize opportunities for use of these tools. Other tools may not have been used as frequently because there may not have been
multiple opportunities to use these tools, or caregivers failed to recognize opportunities to use the tools. If the latter is the case, then the PBC curriculum may need to be revised so that the curriculum incorporates strategies that facilitate identification of opportunities for tool use in the home. Other tools such as the Set expectations and Contract tools may not have been observed in the home because there were no opportunities to use these tools. In this case, a more sensitive measure of effects could assess opportunity for tool use in relation to actual tool use.

At the end of class, caregivers who completed the study reported that fluency drills had positive effects such as facilitating concept and tool recollection at home and in post-tests, facilitating the identification of clear discriminative stimuli for tool use, and accurate tool use in the home. Actual performance data did not correspond with caregiver reports at class completion. However, at the end of the study, caregivers’ reports on the effectiveness of fluency drills were similar to data obtained in the study. Both the data and caregiver opinion indicated that fluency training was not helpful in retention, generalization of tool skills, or increasing performance during class. This change in opinion may have occurred at the end of the study because with the passage of time, caregivers may have been better able to determine the effect that fluency training in class had on their tool use at home, therefore allowing them to make an accurate assessment of treatment effects.

The results of this study indicated that fluency training had little or no effect on increasing tool performance during classroom or in the home. An extension of this study should include strategies that would increase generalization and maintenance. Such strategies may include programming mediators, training loosely, or training multiple
exemplars (Stokes & Baer, 1977). For example, future researchers could train multiple exemplars by presenting multiple role-play opportunities for varying examples of tool use. Role-plays should be similar to interactions present in the home.

Future researchers could also explore use of functional mediators to facilitate generalization, by training the children in the home to solicit reinforcement following appropriate behavior. Therefore regardless of the setting, the child could solicit reinforcement for appropriate behavior and the caregiver would perform the Give positive consequences tool. Caregivers could also be given a magnet or key chain containing tools and tool steps that would be present in the both the training setting and all other settings in which tools could be used. Therefore the caregiver would carry a stimulus that could evoke tool use across multiple settings, thus facilitating generalization.

Another area of research could explore the effect that increased fluency drills on tools beyond the session in which they were taught would have on tool performance in class and at home. Another study could explore whether providing increased fluency training on only complex tools across the eight session class would result in increased performance on these tools.

Researchers also might investigate the reasons for low levels of tool use within the home. There are multiple reasons why this might occur, including poor stimulus discrimination (caregivers’ inability to recognize opportunities for tool use) or lack of opportunities to use certain tools. To investigate the latter, opportunities for tool use would need to be clearly defined and recorded in relation to actual tool use. This line of inquiry would be important in determining the utility of certain tools taught in the
parenting course. If trainers can determine tools with the most utility in the home, caregiver-training curriculums can be streamlined to focus on these tools, which could subsequently increase caregiver tool performance.

Additional research might also investigate the changes in quality of parent/child interactions or types of tool steps completed as a function of training. The data obtained indicated that there were no significant changes in the accuracy of tool use from baseline to training. However, there may have been changes in the quality of interactions; meaning that caregivers during and after training may have been using tool components that may be important in effecting behavior change or improving interaction. A mere calculation of tool accuracy may not have captured such changes. Therefore, future researchers could investigate any changes in the completion of certain “crucial” tool steps that could result in changes in types of interactions or effect changes in child behavior.

This study should also be replicated with an increased number of study participants. The variability in the data, combined with a small number of participants, posed challenges in making definitive conclusions about the effect of fluency training on performance. Additional study participants, combined with the improvements and extensions noted above, may provide additional data that could facilitate more conclusive results.
References


Appendices
Appendix A: Sample Pre-test and Post Test Role play Scripts

**Tool: Stay Close**

**Keep the time of this role-play to around 1 minute**

**Trainer tells the Participant:**
You are in the kitchen getting a drink out of the refrigerator. Your 12-year-old child comes home from school and sits at the kitchen table. S/He looks sad. Show me what you would do.

**Co-Trainer's Role:**
- You are 12 years old
- You come home from school and walk through the door looking sad. (Your best friend at school is moving to ___________(pick a city that is over 100 miles away) at the end of the (semester or month). You are very upset at the thought of losing your best friend. You want to talk to your parent about it.)
- Sit at the kitchen table away from your parent. (When you sit at the table, be far enough that the parent must move in order to be within arms length and or touch you.)
- When you begin to discuss your friend moving, respond morosely and make emotional comments such as: I had a crappy (shitty) day, this sucks, it's stupid and I hate this.
- Make these types of comments intermittently.
- Stop immediately if/when an empathy statement is made.
- If the parent asks questions, answer them, without talking too much
- Avoid eye contact until the parent makes an empathy statement.
- Since problem solving is not part of Stay Close, especially prior to making an empathy statement, respond with more verbal junk (ask a “why” question or argue with the parent).
- If the parent doesn’t ask why you are so sad, complain about your friend moving so that the role-play continues.
- Remember that you want to talk to your parent.

**Trainer:**
- Watch the parents Body Language. Arms folded, hands on hips, standing over the top of the child and looking at things other than the child are not appropriate. Wait to see if they change.
- Close Proximity and Appropriate Body Language must occur by the ½-way point for it to be scored as “yes”.
- If an Appropriate Touch occurs, even at the very end, it is scored as a “yes”.
- Stop the role-play when you have the needed information.
Appendix A (Continued)

Trainer: STOP the role-play when you have the information needed.

**Tool: Give Positive Consequences**

**Suggested Props:** Something that looks like a video game controller.

**Trainer tells the Participant:**
- You are about to enter the living room.
- You know your two children are in the living room playing video games.
- You know your children often argue when they play video games.
- Show me what you would do when you enter the living room.
- *(If there is one trainer pretend that the other child is there)*

**Trainer’s Role:**
- You are playing a video game with your sibling.
- As your parent enters, your sibling says, “I want a try!”
- You say, “Okay, here you go,” as you hand him the controller.
- If the parent does nothing, you say, “Let me try again.”

**Co-Trainer’s Role:**
- You are playing a video game with your sibling.
- As your parent enters the room, say, “I want a try!”
- Take the controller and play.
- If sibling asks for another try, hand controller back.

**Trainer:** STOP the role-play after the video game controller has been passed back and forth twice (whether parent comments or not). If the parent makes a negative response, for example, “I can’t believe you aren’t arguing!” then stop the role-play. If the parent acknowledges, in some positive way, that the children are sharing, this will end the role-play.
Tool: Ignore Junk Behavior

Trainer tells the Participant:
✓ You are in the kitchen after dinner.
✓ Your 11-year-old child is reading a book he/she likes.
✓ His/Her homework is finished.
✓ Ask him/her to take out the garbage.

Co-Trainer’s Role:
• You are the 11-year-old child.
• You are reading a book you really like.
• You do not want to take the garbage out.
• You have just been told to take out the garbage.
• Whine, “But I’m reading my book”.
• You roll your eyes, slam the book shut and slowly get up.
• Walk very slowly, shuffling your feet, pick up the garbage.
• Say: “How come I always have to take the damn garbage out?"
• Emit some more junk, but pause occasionally, allowing the parent time to speak.
• Once the garbage is out, slam the door, pick up your magazine, and say “There, are you happy now?”

Trainer: STOP the role-play when you have the information needed.

Tool: Stop-Redirect-Give Positive Consequences

Trainer tells the Participant:
✓ You are in the living room with your three year-old child and your two month-old baby who is sleeping in the bassinet.
✓ The three-year-old throws a small plastic toy in the bassinet.
✓ You are too far away to prevent this from happening.
✓ Show me what you would do.

Co-Trainer’s Role:
• You are the three year-old child sitting on the floor.
• You are just playing in the living room with your plastic toy.
• You throw a small plastic toy into the bassinet where the baby is sleeping.
• As you throw, you say, “Baby wants toy.”
• If you are redirected, give a brief bit of whining and crying and briefly resist by pulling against the parent or falling to the floor and stomping feet, but not for more than three to five seconds.
• If there is no intervention, get the plastic toy and throw it in again.

**Trainer:** STOP the role-play when you have the information needed.
Appendix B: Interaction Evaluation Questionnaire

Caregiver: _______________________     Date:__________________
Interviewer: ______________________                Class start date: _________

Instructions: Ask the caregiver the following questions and write responses in the spaces provided. The italicized bold heading above each question indicates the reason for presenting the question. **Read only the questions below the headings.**

**Identification of Observation times**

1. What time(s) during the day do you interact with your child the most, and what activities/tasks/chores etc. do you do at that time?

2. List demands/instructions that you place on the child during this time. If no demands are presented at this time, when do you present demands, and what are they?

**Identification of appropriate behavior/ opportunities to provide reinforcement**

3. What demands will/does your child comply with during this time?

**Identification of inconsequential behavior**

4. What demands will your child not comply with during this time?
Appendix B (Continued)

Identification of inconsequential behavior/opportunities for redirection
5. When your child does not comply, what do you typically do?

Identification of opportunities for redirection
6. What are some tasks assigned during this time that you help your child with.

Identification of appropriate behavior
7. What are some tasks assigned during this time that your child does independently?

Identification of interactions for use of “Stay Close” tool
8. Is there any activity that your child enjoys doing at this time, or that both you and your child doing together?
Appendix C: Sample Pre/Post Test, In-class Task Analyses and In-Home Task Analysis

**Tool Checklist: Stay Close**

<table>
<thead>
<tr>
<th>Participant: ___________________</th>
<th>Date: ________</th>
<th>Primary Data Taker: ___________________</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Circle one:</strong> Pre-Test    Post- Test    In-Class    Secondary (IOA) Data Taker: ___________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>yes</th>
<th>no</th>
<th>n/a</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>Get close to the child within 15 seconds of the stay close behavior (move toward child and be within arms reach, etc.)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Touch appropriately (pat, hug, rub, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. <em>Match facial expressions. (Appropriately reflect the emotion of the situation.)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. <em>Use appropriate tone of voice (voice matches situation, a neutral monotone is not good enough).</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. <em>Relax your body language within 15 seconds of the stay close behavior (relaxed, arms open, attentive, looking at child, etc.).</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. <em>Ask open-ended positive questions (what? how? could you?).</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Listen while the child is speaking. Talk less than the child (Do not problem-solve unless the child asks for help. Do not interrupt or abruptly change the topic.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Use empathy statements (Act like a mirror and reflect the child’s feelings, express understanding, caring etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Ignore junk behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. <em>Stay cool throughout the process (no coercives).</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Instructions: Each time a tool is performed mark “Y” if the step is completed, “N” if the step was not completed and “N/A” if there was no opportunity to complete the step.*
Appendix C (Continued)

**Bolded and italicized steps must be completed for task to be considered a performance of the tool.** Trainer’s Notes: These steps do not have to be completed in any particular order after step 5. A single instance of a punitive, disgusted or inappropriate facial expression (step 3), tone of voice (step 4) or body language (step 5) during any part of the role play should be scored “no” for step 3, 4, or 5. Only one open-ended question is needed to score a “yes” for step 6. If problem-solving is used without child asking for it, score “no” for step 7. If the parent begins to problem-solve, note if it occurs before or after the empathy statement. Only one instance of an empathy statement is needed to score a “yes” for step 8. A single instance of attending to junk behavior throughout the role play will be scored “no” for step 9. **Overall Comments:** (Circle any coercives used: sarcasm/teasing; criticism; threats; arguing; questioning; logic; despair, pleading, hopelessness; force; taking away privileges/items/allowance; one up-man-ship; silent treatment; telling on them to others? Be specific.)
## Tool Checklist: Give Positive Consequences

### Participant: __________________ Date: _______ Primary Data Taker: _______

**Circle one:** Pre-Test  Post- Test  In-Class  Secondary (IOA) Data Taker: _______

<table>
<thead>
<tr>
<th>Step</th>
<th>yes</th>
<th>no</th>
<th>n/a</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell the child which appropriate behavior he/she demonstrated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Provide a positive consequence that fits the appropriate behavior. (Circle those provided):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Verbal praise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Appropriate touch (hug, pat, kiss, high five, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tangible item (thing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Appropriate privilege</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Provide the positive consequence during the appropriate behavior or no longer than 3 seconds after the appropriate behavior has occurred.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Staying Close Components</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Get close to the child as appropriate to the situation (move toward child and be within arms reach, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Touch appropriately (pat, hug, rub, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Match facial expressions (reflect the emotion of the situation).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Use appropriate tone of voice (voice matches situation, a neutral monotone is not good enough).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Appropriate body language when providing consequence (relaxed, arms open, attentive, looking at child, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Stay cool throughout the process (no coercives).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C (Continued)

Instructions: Each time a tool is performed mark “Y” if the step is completed, “N” if the step was not completed and “N/A” if there was no opportunity to complete the step. Bolded and italicized steps must be completed for task to be considered a performance of the tool.

Trainer’s Notes: 1 The staying close components must be used within 3 seconds of the parent responding to the appropriate behavior. If used after 3 seconds or not at all, score these items “no.” 2 Score step 4 “yes” if parent moves within arm’s reach even briefly. 3, 4, 5 Score “no” if there is any instance of inappropriate expression, tone of voice, or body language after the first 3 seconds. Overall Comments: (Circle any coercives used: sarcasm/teasing; criticism; threats; arguing; questioning; logic; despair, pleading, hopelessness; force; taking away privileges/items/allowance; one up-man-ship; silent treatment; telling on them to others? Be specific.)
Appendix C (Continued)

Tool Checklist: Ignore Junk Behavior

<table>
<thead>
<tr>
<th>Participant:</th>
<th>Date:</th>
<th>Primary Data Taker:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Circle one:** Pre-Test  Post-Test  In-Class  **Secondary (IOA) Data Taker:** _________

<table>
<thead>
<tr>
<th>Step</th>
<th>yes</th>
<th>no</th>
<th>n/a</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t say anything about the junk behavior. *(For example, “Stop that now!” and “Quit that!”)*¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t do anything differently when the junk behavior happens <em>(don’t react, roll your eyes, stomp out of room, cross your arms, stare, etc.)</em>.²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do another activity independent of the child <em>(e.g. talk to another child)</em>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When appropriate behavior occurs, give a positive consequence. Circle those demonstrated:
- Verbal praise
- Appropriate touch *(hug, pat, kiss, high five, etc.)*
- Tangible item *(thing)*
- Appropriate privilege

5. Give a positive consequence no longer than 3 seconds after the junk behavior has stopped.

6. Stay cool throughout the process *(no coercives)*.

Instructions: Each time a tool is performed mark “Y” if the step is completed, “N” if the step was not completed and “N/A” if there was no opportunity to complete the step. Bolded and italicized steps must be completed for task to be considered a performance of the tool.

Trainer’s Notes: ¹² Score “no” if there is any response to the junk behavior, including laughing or any change of expression. However, if the parent realizes they have responded to the junk behavior and stops the response, note this in the Comments and reinforce the parent for their acknowledgment and correction. **Overall Comments:** *(Circle any coercives used: sarcasm/teasing; criticism; threats; arguing; questioning; logic; despair, pleading, hopelessness; force; taking away privileges/items/allowance; one up-man-ship; silent treatment; telling on them to others? Be specific.)*

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### Tool Checklist: Stop-Redirect-Give Positive Consequences

**Participant:** __________  **Date:** __________  **Primary Data Taker:** __________

**Circle one:** Pre-Test  Post-Test  In-Class  Secondary (IOA) Data Taker: __________

<table>
<thead>
<tr>
<th>Step</th>
<th>yes</th>
<th>no</th>
<th>n/a</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get within arms reach of the child (before saying anything).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Say only, “Stop (behavior)” or something like, “Don’t hit”. (Score no if longer comments or repeated comments made.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Make sure the child stops the behavior within 3 seconds of demand delivery. (Use gentle physical guidance if necessary.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Tell the child to do something else (i.e., a positive alternative activity).</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. If the child does not do an appropriate activity within 3 seconds of task delivery, model, or gently guide them to do the activity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Give a positive consequence for doing the appropriate behavior (praise, touch).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Give the positive consequence <strong>within 3 seconds</strong> after the appropriate behavior begins or stopping of the serious behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Do not say or do anything about junk behavior throughout the process.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Stay cool throughout the process (no coercives)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Instructions:** Each time a tool is performed mark “Y” if the step is completed, “N” if the step was not completed and “N/A” if there was no opportunity to complete the step. **Bolded and italicized steps must be completed for task to be considered a performance of the tool.**
Appendix C (Continued)

**Overall Comments:** (Circle any coercives used: sarcasm/teasing; criticism; threats; arguing; questioning; logic; despair, pleading, hopelessness; force; taking away privileges/items/allowance; one up-man-ship; silent treatment; telling on them to others? Be specific.)
# Stay Close Checklist – In Home

**Participant:** __________

**Date:** __________

**Primary Data Taker:** __________

**Secondary (IOA) Data Taker:** __________

**Session #:** __________

<table>
<thead>
<tr>
<th>Step</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get close to the child within 15 seconds of the stay close behavior (move toward child and be within arms reach, etc.).</td>
<td></td>
</tr>
<tr>
<td>2. Touch appropriately (pat, hug, rub, etc.).</td>
<td></td>
</tr>
<tr>
<td>3. Match facial expressions. (Appropriately reflect the emotion of the situation.)</td>
<td></td>
</tr>
<tr>
<td>4. Use appropriate tone of voice (voice matches situation, a neutral monotone is not good enough).</td>
<td></td>
</tr>
<tr>
<td>Relax your body language within 15 seconds of the stay close behavior (relaxed, arms open, attentive, looking at child, etc.).</td>
<td></td>
</tr>
<tr>
<td>Ask open-ended positive questions (what? how? could you?).</td>
<td></td>
</tr>
<tr>
<td>Listen while the child is speaking. Talk less than the child (Do not problem-solve unless the child asks for help. Do not interrupt or abruptly change the topic.)</td>
<td></td>
</tr>
<tr>
<td>Use empathy statements (Act like a mirror and reflect the child’s feelings, express understanding, caring etc.).</td>
<td></td>
</tr>
<tr>
<td>Ignore junk behavior.</td>
<td></td>
</tr>
<tr>
<td>Stay cool throughout the process (no coercives).</td>
<td></td>
</tr>
</tbody>
</table>

**Instructions:** Each time a tool is performed mark “Y” if the step is completed, “N” if the step was not completed and “N/A” if there was no opportunity to complete the step. Bolded and italicized steps must be completed for task to be considered a performance of the tool.

**Trainer’s Notes:** These steps do not have to be completed in any particular order after step 5. A single instance of a punitive, disgusted or inappropriate facial expression (step 3), tone of voice (step 4) or body language (step 5) during any part of the role play should be scored “no” for step 3, 4, or 5. Only one open-ended question is needed to score a “yes” for step 6. If problem-solving is used without child asking for it, score “no” for step 7. If the parent begins to problem-solve, note if it occurs before or after the empathy statement. Only one instance of an empathy statement is needed to score a “yes” for step 8. A single instance of attending to junk behavior throughout the role play will be scored “no” for step 9. **Overall Comments:** (Circle any coercives used: sarcasm/teasing; criticism; threats; arguing;)

---

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Appendix D: Participants Data Sheet and Graph

**Fluency Data Sheet**

Name: _______________________

Circle one: Practice  Experiment  Home

Write the number of flash cards that were correct, incorrect and passed for each trial.

<table>
<thead>
<tr>
<th>Date: ______</th>
<th>Session #: _____</th>
<th>Date: ______</th>
<th>Session #: _____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial</td>
<td>Correct</td>
<td>Incorrect</td>
<td>Pass</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>x</td>
<td>△</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>x</td>
<td>△</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>x</td>
<td>△</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>x</td>
<td>△</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>x</td>
<td>△</td>
</tr>
</tbody>
</table>
### Appendix E: Sample Flash Cards

<table>
<thead>
<tr>
<th>Ignore Junk: Step 1</th>
<th>SAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t _______ anything about the junk behavior when it happens.</td>
<td>Q: 1</td>
</tr>
<tr>
<td></td>
<td>A: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What tool would you use?</th>
<th>Ignore Junk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jimmy is whining for ice cream</td>
<td>Q: 2</td>
</tr>
<tr>
<td></td>
<td>A: 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is this?</th>
<th>Empathy statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>You sound upset</td>
<td>Q: 3</td>
</tr>
<tr>
<td></td>
<td>A: 3</td>
</tr>
</tbody>
</table>
Appendix F: Trainer Script for Fluency Drill

The following is the trainer’s script that should be used to prompt participants through fluency drills. Read the following instructions:

Trainer: It’s study time. Everyone take out their flash cards.
   Wait for participants to take out flash cards.

Trainer: You will have 2 minutes of study time. When study time is completed, we will do a drill. You may start studying when I say “You may begin”, and stop when I say, end”.
   You may begin.
   Start timing two minutes. At the end of two minutes . . .

Trainer: End.

Trainer: It’s time for a drill. Get your cards and data sheets ready.
   Wait for participants to place cards and data sheets in front of them, on their desks.

Trainer: Decide who goes first. If you went first the last time, it is now time for you to go Second.
   Wait for participants to decide order.

Trainer: Shuffle your cards.
   Wait until all participants have shuffled cards.

Trainer: You will have 1 minute to complete as many cards as you can. Your time will start when I say go. Time is up, when I say stop. Ready, set, go!
   Start timing. When time has elapsed . . .

Trainer: Stop. Record your data.
   Wait for all participants to record their data.

Trainer: Now, switch roles.
   Wait for all participants to exchange cards and data sheets.

Trainer: Shuffle your cards.
Appendix F (Continued)

Wait until all participants have shuffled cards.

**Trainer:** You will have 1 minute to complete as many cards as you can. Your time will start when I say go. Your time is up, when I say stop. Ready, set, go!

Start timing. When time has elapsed . . .

**Trainer:** Stop, and record your data

Wait for all participants to record their data.

**Trainer:** You will now have 2 minutes of review time. During this time, you may review the cards that you got correct, incorrect, or missed. Review time will start now

Start timing for 2 minutes. When time has elapsed . . .

**Trainer:** Provide a praise statement (e.g. Nice work). You may put your cards away.
Appendix G: Social Validity Questionnaire

*Please circle the number below each statement that most accurately describes your response to the following questions.*

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

1. Flash card drills helped me remember tools and concepts learned in class.

   1  2  3  4  5

2. Flash card drills were enjoyable.

   1  2  3  4  5

3. Flash card drills helped me use tools correctly in with the children in my home.

   1  2  3  4  5

4. In class I learned to play gin with my flash cards.

   1  2  3  4  5

5. Flash card drills helped me to know when I should use a specific tool in my home.

   1  2  3  4  5

6. I did not enjoy using the flash cards.

   1  2  3  4  5

7. Flash card drills helped me to perform better on my post-test role-play.

   1  2  3  4  5

8. Overall, the use of flash cards was beneficial to my learning.

   1  2  3  4  5